Advanced Ready-Mix Concrete Solutions in Cyprus by N.P.P. Betomix Ltd

N.P.P. Betomix Ltd operates in the field of production and supply of high-specification ready-mix concrete, fully meeting the requirements of modern construction across Cyprus. Our production is based on strict quality standards, in line with international and European specifications (CYS EN 206 and ISO 9002), ensuring optimal results in every application.

With modern mixing equipment and automated control systems, we produce concrete across a wide range of compressive strength classes (C12/15 to C60/75 and above) and exposure classes (XD, XF, XA, XC, XS), tailored to the needs of special applications. Our production includes mixtures with a maximum aggregate size of 20 mm as well as 10 mm, depending on project requirements and placement conditions. Both concrete categories achieve the required compressive strengths according to the respective standards. We also provide products for long-working-time plasters and renders, suitable for a variety of applications in masonry, cladding, and decorative surfaces.

Our product line includes pumpable, self-compacting, fiber-reinforced, shotcrete, as well as special mixes with admixtures for set retardation or acceleration, high-strength concrete, frost-resistant concrete, innovative colored and pervious mixes, and more.

The quality of our raw materials, precise admixture dosing, and strict control procedures at every stage of production ensure excellent workability, mechanical strength, chemical resistance, and long-term structural stability. We also implement environmentally responsible practices, incorporating recyclable raw materials such as fly ash and microsilica, contributing to the sustainability of projects.

N.P.P. Betomix Ltd provides full technical support and consulting throughout the design and execution stages, ensuring optimal performance and compliance with applicable standards and regulations. Fast delivery, reliability, and flexibility in service are fundamental values for us, making us the ideal partner for projects of any scale.

Choose N.P.P. Betomix Ltd for innovative, high-quality, and technically advanced ready-mix concrete solutions that meet the demands of the modern construction industry with safety and durability.

Pumpable Concrete

Pumpable concrete is a specially designed mix that allows it to be transported via pumps over long distances or vertical heights, without segregation of its components. It is the ideal solution for projects where access by mechanical equipment is limited or placement conditions make traditional pouring methods difficult.

Technical Characteristics:

- **Mixes designed for pumpability:** The mixture includes properly graded aggregates and sufficient fines content to ensure cohesion and flowability.
- **Optimized water-cement ratio (w/c):** Balanced to achieve the required workability without negatively affecting strength or durability.
- **Use of chemical admixtures:** Typically includes new-generation superplasticizers (e.g., polycarboxylates) to achieve high workability without excessive water content.
- **Durability assurance:** Pumpable concrete resists bleeding and aggregate segregation during pumping.

Advantages:

- Facilitates concrete placement in hard-to-reach or elevated areas.
- Significantly reduces placing time and on-site labor.
- Ensures uniform and continuous concrete supply in large volumes.
- Ideal for high-rise buildings, bridges, underground structures, retaining walls, tunnels, etc.
- Enhances the quality and durability of the final structure through uniform placement and compaction.

At N.P.P. Betomix Ltd, we have extensive experience and know-how in designing pumpable concrete mixes, offering solutions tailored to the specific demands of each project and the particularities of the Cypriot climate and construction conditions.

Fair-Faced Concrete – Board-Formed (Timber-Imprinted) Concrete

Fair-faced concrete refers to concrete that remains visible on the final surface of the structure, without any additional coverings, plasters, or paints, serving both a structural and aesthetic purpose. This material is high in demand, as its final appearance directly reflects the quality of construction and the expertise applied. Included in this category is board-formed concrete – concrete that retains the imprint of timber boards.

Technical Characteristics and Particularities:

- **Formwork quality:** The final aesthetic greatly depends on the quality and type of timber or metal formwork, which must be impeccably clean and secured to prevent voids, markings, or deformations.
- **Concrete mix design:** The mix must have appropriate workability to fully fill the formwork without leaving gaps (air pockets, blemishes). Superplasticizers are often used to improve flow without increasing the water-cement ratio.
- **Compaction:** Vibration must be carefully applied to avoid surface marks or streaks, while ensuring full concrete density.
- **Color uniformity:** A key requirement for fair-faced concrete is color consistency, which is influenced by mix design, raw materials, and casting procedures.
- **Protection and curing:** After formwork removal, careful curing is required, often with the application of protective coatings to maintain aesthetics and durability.

Advantages:

- Unique architectural appearance, with natural texture and color variations.
- Eliminates the need for plasters or claddings, reducing costs.
- High durability and longevity.
- Suitable for modern architectural applications in both interior and exterior spaces, such as walls, columns, façades, cultural venues, and public works.

At N.P.P. Betomix Ltd, we have specialized expertise in the production of fair-faced concrete, offering high-specification mixes and consulting services to ensure excellent aesthetic and structural results, tailored to the specific needs of each project.

Self-Compacting Concrete (SCC)

Self-compacting concrete (SCC) is a specially designed concrete that flows and fills formwork on its own, without the need for mechanical vibration or compaction. It was developed to facilitate concreting in complex or densely reinforced structures, ensuring high quality and a flawless finish.

Technical Characteristics:

- **Exceptional flowability:** SCC exhibits very high workability and flow capacity, without segregation of its components (cement, aggregates, water).
- **Complete formwork filling:** Ideal for areas with dense reinforcement or intricate shapes where conventional vibration is difficult or impossible.
- **Homogeneous finish:** Delivers excellent surface quality, reducing visible imperfections or blemishes.
- **Reduced noise and vibration:** The absence of vibrators creates a quieter and safer work environment.
- **Mix composition:** Achieving self-compaction is based on new-generation superplasticizers and often includes selected fine materials (e.g., fillers, fly ash, microsilica) to improve cohesion and mix stability.

Advantages:

- Faster concreting, reducing on-site time.
- Higher construction quality and long-term durability.
- Lower labor costs due to the elimination of vibration equipment.
- Ideal for fair-faced concrete thanks to its consistent surface finish.
- Minimizes the risk of defects or voids, especially in complex structures.

At N.P.P. Betomix Ltd, we produce high-performance self-compacting concretes tailored to the specific demands of each project, providing complete technical support for their selection and safe, effective application.

Fiber-Reinforced Concrete (FRC)

Fiber-reinforced concrete is a type of concrete that incorporates fibers (metallic, synthetic, or natural) to significantly improve its mechanical and physical properties. The fibers are uniformly dispersed throughout the mix, acting as micro-reinforcement to limit crack propagation and enhance the material's durability.

Types of Fibers:

- **Steel Fibers:** Primarily used to increase flexural strength, shear resistance, and impact load capacity. Ideal for heavy-duty applications such as industrial floors, warehouse slabs, port facilities, etc.
- **Synthetic Fibers (Polypropylene, Macro & Micro fibers):** Help control shrinkage cracking, improve resistance to environmental effects, and enhance cohesion in the fresh concrete.
- **Natural Fibers (e.g., cellulose fibers):** Used in limited applications, mainly for eco-friendly or specialized uses.

Advantages of Fiber-Reinforced Concrete:

- Reduces crack formation in both fresh and hardened concrete.
- Increases resistance to fatigue, impact, and corrosion.
- May reduce or even replace conventional reinforcement in certain applications.
- Provides uniform reinforcement throughout the concrete mass.
- Enhances fire resistance and thermal shock resistance (especially with micro synthetic fibers).

Fiber-Reinforced Concrete for Flooring

Fiber-reinforced concrete for floors is a specialized application, particularly popular in industrial and large-scale storage facilities where high mechanical strength and durability under heavy use are required.

Characteristics and Advantages:

- Resistance to mechanical loads (movement of heavy vehicles, forklifts, etc.).
- Reduces or eliminates the need for traditional reinforcement, lowering both cost and construction time.
- Limits plastic and drying shrinkage cracking—very common in industrial floors.
- Provides uniform reinforcement throughout the cross-section, offering better performance against cracks caused by thermal or structural movement.
- Extends floor service life and reduces maintenance costs.

- Enables thinner floor slabs due to improved mechanical strength.

Our company provides specially designed fiber-reinforced concrete mixes for floors, tailored to the specific loading and use requirements of each project, with full technical support from fiber selection to on-site application.

Shotcrete / Sprayed Concrete

Shotcrete (also known as sprayed concrete) is concrete conveyed through pipes under pressure and sprayed onto surfaces, where it compacts and adheres simultaneously. It is one of the most flexible solutions for projects requiring fast application, surface reinforcement, or coating.

Common Applications:

- Tunnels and underground works
- Slopes and rock stabilization
- Concrete repairs
- Water tanks, swimming pools, and special infrastructure
- Architectural applications with complex shapes

There are two primary shotcrete methods:

Dry-Mix Shotcrete

- Delivered as a dry mix (cement, aggregates, admixtures).
- The dry mix is conveyed through a hose using compressed air.
- Water is added at the nozzle during spraying.
- The operator controls the water content to achieve the desired consistency.
- Suitable for small-scale repairs or when mix supply flexibility is needed.

Wet-Mix Shotcrete

- The concrete mix is fully prepared (with water) at the batching plant.
- Spraying is performed with a pump under pressure, using compressed air only at the nozzle.
- Provides better mix quality, higher strength, and lower material loss.
- Ideal for large-scale projects requiring high-volume spraying in a short time.
- Often includes accelerators for rapid strength development, especially in underground works.

Advantages of Shotcrete:

- Excellent adhesion to any surface (concrete, stone, metal).
- Ideal for irregular surfaces or complex geometries.

- Fast execution of works.
- Can be reinforced with fibers for added strength (fiber-reinforced shotcrete).
- A superior solution for temporary or permanent linings in tunnels and slopes.

N.P.P. Betomix Ltd supplies both dry and wet-mix shotcretes, adapted to the specific needs of each project, offering specialized high-performance mixes and full technical support throughout the application process.

Colored Concrete

Colored concrete is a specialized type of concrete in which, beyond the basic ingredients (cement, aggregates, water), special pigments are added to achieve a uniform and permanent coloration of the final surface.

Types of Pigments:

- **Metal Oxides** (e.g., iron oxides for red or brown tones)
- **Organic or inorganic colorants** with high resistance to weather and UV exposure

Characteristics and Advantages:

- **Aesthetic enhancement:** Offers unique design opportunities and rich coloring without requiring additional coatings or paints.
- **Durability:** Pigments are fully integrated within the concrete matrix, ensuring long-lasting color stability, even under harsh weather, UV exposure, and mechanical wear.
- **Low maintenance:** Unlike surface-applied coatings, it doesn't require frequent repainting or special care.
- **Versatility:** Suitable for pavements, sidewalks, squares, decorative elements, masonry, and other architectural uses.
- **Environmentally friendly:** Avoids the use of volatile organic compound-based coatings.

Applications:

- Public spaces, parks, and squares
- Decorative flooring in commercial centers and residences
- Industrial floors with added aesthetic value
- Architectural projects requiring unique color expression and visual harmony

N.P.P. Betomix Ltd provides high-quality colored concrete with full technical support for color selection and application, ensuring the best outcome for every project. We offer a wide range of colors and can produce custom shades on request.

Pervious Concrete

Pervious concrete (also known as permeable or porous concrete) is a specially engineered concrete designed to allow water to pass through its mass. This is achieved by using reduced fine aggregates and increased void content, creating an interconnected pore network that facilitates natural rainwater drainage.

Characteristics:

- **High porosity (typically 15–25%)** allowing water to percolate directly into the ground.

- **Reduced or no fine aggregates** to maintain permeability.
- **Sufficient strength** for pavements, sidewalks, and low-traffic parking areas.
- **Enhanced environmental performance** by reducing runoff and supporting groundwater recharge.

Colored Pervious Concrete

We also provide pervious concrete in a variety of colors, combining functionality with visual appeal. The pigments used are specially selected not to affect permeability or mechanical behavior, offering permanent color and durability under weather exposure.

Applications:

- Parking lots and sidewalks in urban areas requiring stormwater management
- Walkways, pedestrian paths, and bike lanes combining function and aesthetics
- Urban plazas and landscaping where permeability improves microclimate and reduces flooding
- Sports facilities and tennis courts requiring good drainage
- Industrial and commercial sites with regulated water use
- Green areas and parks where natural water infiltration is desired

Our high-quality pervious concrete solutions meet the required durability, functionality, and aesthetic standards, supporting environmentally friendly and sustainable construction.

Factory-Made Plaster and Long-Workability Renders

Factory-made plaster refers to specially formulated rendering products produced and quality-controlled in modern manufacturing plants, ensuring consistent properties and performance. The innovation of these renders lies in their extended workability — remaining usable for at least 36 hours after production — offering flexibility during application without compromising technical performance.

Characteristics and Advantages:

- **Controlled formulation:** Produced under strict conditions using high-quality, consistently proportioned materials, ensuring uniformity in every batch.
- **Extended workability:** The long working time (up to 36 hours) allows for flexible scheduling, reducing time pressure and increasing on-site productivity.
- **Easy application:** Improved flow and uniformity facilitate even spreading on all types of surfaces, from interior walls to external façades.
- **Durability and strength:** Factory-made renders provide high mechanical resistance, good adhesion, and protection against cracking, moisture, and weathering.
- **Waste reduction:** Industrial production minimizes the need for on-site measuring and mixing, reducing errors and material waste.

Applications:

- Interior and exterior walls in residential, commercial, and industrial buildings
- Renovation and repair projects requiring reliable and efficient application
- Large-scale projects with tight deadlines and strict quality requirements
- Waterproofing and protective coatings in combination with suitable admixtures

Our company provides high-specification factory-made renders and plasters with full technical support and flexible delivery, meeting the needs of modern construction in Cyprus.

Waterproof Concrete

Waterproof concrete is specifically designed to prevent water and moisture penetration through its mass. It involves carefully selected materials and additives that increase density and reduce permeability, making it ideal for applications where watertightness is critical.

Characteristics:

- **Reduced water permeability:** Achieved through specialized waterproofing admixtures (hydrophobic or crystalline), which block water ingress and migration.
- **Increased density:** Optimized ratios of cement, aggregates, and additives enhance cohesion and limit pore structure.

- **Chemical resistance:** Often offers improved durability against aggressive chemicals like sulfates or seawater, which can cause deterioration.
- **Extended service life:** Effective waterproofing protects the concrete and embedded reinforcement from moisture-related damage and corrosion.

Applications:

- Basements, underground stations, retaining walls, and tunnels
- Water tanks, swimming pools, canals, and storage reservoirs
- Wet environments such as underwater streams, sewage systems, and wastewater treatment plants
- Foundations and structures in areas with high hydrostatic pressure
- Marine structures or constructions exposed to continuous water contact

Additives and Techniques:

- **Crystalline waterproofing admixtures:** Develop crystals within the pores to seal them
- **Hydrophobic additives:** Reduce surface tension to block water absorption
- **Microsilica or reduced fines content:** Improves density and impermeability
- **Proper compaction and curing:** Ensures minimal cracking and effective sealing

N.P.P. Betomix Ltd supplies high-performance waterproof concrete using advanced technologies and certified additives to meet the most stringent project demands in Cyprus. We also provide technical support and customized solutions based on project-specific conditions.

EPS Concrete (Polystyrene Concrete)

EPS concrete is a lightweight type of concrete in which traditional aggregates are replaced by expanded polystyrene (EPS) beads. This type of concrete is characterized by low density and a significantly reduced thermal conductivity coefficient, making it ideal for thermal insulation and lightweight construction.

Characteristics:

- **Low density:** Replacing conventional aggregates with polystyrene beads greatly reduces the concrete's weight, decreasing loads on structural elements and infrastructure.
- **Low thermal conductivity:** EPS concrete offers excellent thermal insulation, improving the energy efficiency of buildings.
- **Pumpability and formability:** It can be pumped, facilitating its application on complex or large surfaces. Its flowability also allows for slope creation on roofs or terraces while providing insulation.
- **Good workability and bonding:** The EPS concrete mix ensures uniform dispersion of polystyrene spheres, improving cohesion and mechanical behavior.

Applications:

- Thermal insulation layers on roofs, terraces, and ceilings, where slope formation is also required
- Lightweight constructions and load dampeners where reduced weight is critical
- Subfloor screeds to enhance thermal insulation
- Renovation and retrofit insulation in existing buildings

Technical Data:

- Density typically ranges from 600 to 1600 kg/m^3, depending on the EPS ratio
- Thermal conductivity (λ) is very low, generally between 0.12–0.32 W/mK
- Compressive strength is lower than conventional concrete, so its use is limited to non-load-bearing applications

Our company supplies certified EPS concrete with high-quality materials and production standards, along with technical support for any application, contributing to energy-efficient and modern constructions in Cyprus.

CBS Concrete (Cement Bound Sand)

CBS Concrete (Cement Bound Sand) is a semi-rigid material made primarily from sand bound with cement in specific proportions. It features high compressive strength — though lower than

conventional concrete — and is mainly used as a foundation or sub-base layer in infrastructure works. CBS is delivered in dry form.

Characteristics:

- **Sand-cement binding:** Sand acts as the main aggregate and cement as the binder, producing a compact and durable material with limited plasticity.
- **Semi-rigid and dense structure:** Offers high stability and load-bearing capacity, while being more flexible than traditional concrete, reducing cracking risks.
- **Good workability:** CBS is easy to place and compact using standard machinery.
- **Load resistance:** Suitable for traffic loads in roads, sidewalks, and public spaces.

Applications:

- Sub-base layers for roads, sidewalks, plazas, and parking areas
- Foundation layers beneath paving stones or asphalt
- Embankments and surfaces requiring stable, durable bases
- Industrial floors with low to moderate load requirements

Technical Data:

- **Compressive strength:** Typically between 1.5 and 7 MPa, depending on mix and application
- **Density:** Approximately 1800 – 2000 kg/m^3
- **Setting and curing time:** Similar to standard concrete, with traffic typically allowed within a few days depending on conditions

N.P.P. Betomix Ltd offers high-quality CBS Concrete produced with modern equipment and reliable materials, ensuring maximum performance and durability in infrastructure projects across Cyprus. We also provide technical guidance for appropriate selection and application.

Controlled Low Strength Material (CLSM) – Flowable Fill

CLSM, or Controlled Low Strength Material (also known as flowable fill), is a specially designed ready-mix concrete with low compressive strength, high flowability, and excellent workability. It is primarily used as a backfill, void-filling, or subgrade stabilization material—an economical and efficient alternative to traditional compacted soils or base materials.

Characteristics:

- **Low compressive strength:** Typically ranging from 0.3 to 8 MPa, depending on project needs. The low strength allows for future excavation if needed.
- **High flowability:** CLSM is self-leveling, fills all voids, and requires no mechanical compaction, reducing labor and placement time.
- **Reduced settlement risk:** Unlike compacted soils, CLSM provides uniform and stable behavior over time without settling.
- **Excellent workability:** Easily pumped and placed, even in difficult-to-access areas.

Applications:

- Backfilling of trenches for water supply, sewer, and MEP (mechanical/electrical/plumbing) networks
- Void filling behind retaining walls, under foundations, or around pipes
- Soil stabilization in areas where settlement is not acceptable
- Filling abandoned pipe networks or manholes
- Temporary or permanent works where future excavation is needed

Technical Data:

- **Compressive strength:** 0.3 to 8 MPa (typically 1–2 MPa for fill applications)
- **Density:** Around 1600–2000 kg/m^3, depending on mix
- **Little to no need for vibration or compaction**
- **Faster placement compared to conventional fill methods**

N.P.P. Betomix Ltd supplies project-specific CLSM concrete with certified quality and excellent technical support. We provide materials that meet both mechanical requirements and cost/time efficiency, contributing to faster and safer infrastructure execution in Cyprus.

Frost-Resistant Concrete – Freeze/Thaw Cycle Resistant Concrete

Frost-resistant concrete is specially designed to maintain its structural integrity and mechanical properties even after repeated freeze-thaw cycles, during which water within the concrete pores freezes and thaws.

Characteristics:

- **Enhanced durability:** Engineered to limit water penetration into pores and withstand pressure from ice expansion.
- **Air-entraining admixtures:** Microscopic air bubbles are uniformly distributed throughout the mix, acting as "relief chambers" for expanding ice, reducing internal stress and cracking.
- **Reduced water absorption:** Achieved through low water/cement ratio and dense aggregate composition.
- **Resistance to de-icing chemicals:** Protects concrete surfaces from aggressive salts used in winter road maintenance.

Applications:

- Outdoor pavements, sidewalks, plazas, and access ramps in cold regions
- Roads, airports, and port facilities exposed to freeze-thaw cycles and de-icing salts
- Bridge elements, retaining walls, irrigation, and hydraulic works in frost-prone areas
- Precast concrete elements to be installed in cold environments
- Concrete freezers and refrigeration structures

Technical Data:

- **Freeze-thaw resistance:** Withstands cycles without significant strength loss or surface scaling
- **Air content:** Typically 4–6% for concrete exposed to freezing
- **Water/cement ratio:** Kept low to increase density and reduce water absorption
- **Resistance to de-icing salts (e.g., sodium or calcium chlorides)**

N.P.P. Betomix Ltd offers frost- and freeze-thaw cycle-resistant concrete, designed according to European and international standards, ensuring long service life and reduced maintenance costs for demanding applications in Cyprus and any region requiring weather resistance.

Roller Compacted Concrete (RCC)

Roller Compacted Concrete (RCC) is a type of dry, no-slump concrete that is placed and compacted using equipment similar to that used in asphalt paving. It is especially suitable for applications requiring high load-bearing capacity, long service life, and fast, economical construction.

Characteristics:

- **Very low water content:** Designed with just enough moisture to ensure proper hydration and compaction.
- **Dry consistency:** RCC resembles damp gravel and is laid with paving machines, then compacted with vibratory rollers.
- **Fast construction:** No formwork, reinforcement, or vibration is needed, which speeds up the process.
- **Durability:** Provides excellent resistance to heavy loads, wear, and environmental exposure.

Applications:

- Pavements for heavy-duty industrial areas, logistics centers, and container terminals
- Roads, highways, and low-maintenance rural routes
- Airport aprons, runways, and taxiways
- Dam bases and gravity dams
- Container yards, storage platforms, and port facilities
- Large-scale public infrastructure where strength and cost-efficiency are key

Technical Data:

- **Compressive strength:** Typically 20–50 MPa
- **Water/cement ratio:** Very low, often < 0.40
- **Slump:** Essentially zero – mix is very stiff
- **Application thickness:** 15–30 cm per layer, depending on design
- **Compaction:** With heavy rollers, achieving excellent density and strength

N.P.P. Betomix Ltd produces RCC mixes according to specific project requirements, ensuring consistent performance, fast placement, and minimal maintenance over the structure's lifespan.

Mass Concrete

Mass concrete refers to any large-volume concrete placement where the generation of heat from cement hydration could cause thermal cracking if not properly managed. It is used in the

construction of massive elements with large cross-sections and significant structural load-bearing capacity.

Characteristics:

- **Large thermal mass:** As cement hydrates, heat is generated internally, and without proper controls, this may cause differential temperature and cracking.
- **Slow heat dissipation:** Due to the element's volume, heat cannot escape quickly to the environment.
- **Thermal control required:** Special measures are taken during design and casting (cooling pipes, insulation, scheduling pours during cooler periods, etc.)

Applications:

- Dams and hydro-technical structures
- Foundations of high-rise buildings and wind turbines
- Bridge piers and large-scale retaining walls
- Nuclear and thermal power plant bases
- Massive slabs and industrial footings

Design Considerations:

- **Low-heat cements** or pozzolanic additives (e.g., fly ash, GGBS) to reduce heat of hydration
- **Gradual temperature rise and controlled cooling** to avoid internal stresses
- **Monitoring** with temperature sensors and data loggers during curing
- **Extended setting times** with use of retarders or temperature-controlled mixes

N.P.P. Betomix Ltd supplies concrete for mass placements designed to manage thermal loads and minimize cracking risks. We offer expert consultation on mix design, delivery, and placement methods to ensure structural stability and long-term durability.

High-Strength Concrete (HSC)

High-Strength Concrete (HSC) is a specialized type of concrete with a compressive strength significantly higher than that of conventional structural concrete. It is used in demanding applications where structural loads are intense or space limitations require smaller yet stronger elements.

Characteristics:

- **Compressive strength:** Typically exceeds 50 MPa, with standard use in classes from C50/60 up to C80/95 and higher, depending on structural requirements.
- **High-quality raw materials:** Requires carefully selected aggregates, low water/cement ratios, and advanced chemical admixtures.
- **Enhanced durability:** Exhibits greater resistance to abrasion, chemical attack, water penetration, and environmental degradation.
- **Improved modulus of elasticity:** Reduces deformations under load, allowing for slender and lighter structural designs.

Applications:

- High-rise buildings, where reduced column size increases usable space
- Bridges and long-span elements where high strength and reduced weight are critical
- Marine and offshore structures subjected to high pressure and corrosion
- Precast prestressed concrete members (beams, piles, girders)
- Infrastructure requiring high early strength for fast track construction

Technical Data:

- **Water/cement ratio:** Typically < 0.35
- **Strength classes:** C50/60 to C80/95+
- **Use of silica fume or fly ash:** To enhance strength and reduce permeability
- **Advanced superplasticizers:** Ensure workability despite low water content

At N.P.P. Betomix Ltd, we design and supply high-strength concretes tailored to the structural and durability needs of each project, ensuring maximum performance, long-term serviceability, and cost-efficiency.

Concrete for Foundations and Rafts

Concrete used in foundations and raft slabs must meet high performance and durability standards, as it is critical to the stability and longevity of any structure. It must resist soil moisture, settlement loads, and chemical attack from the subsoil environment.

Characteristics:

- **Compressive strength:** Typically in the C25/30 to C35/45 range, depending on structural design.
- **Workability:** Must allow for complete placement around reinforcement and into complex formwork, especially in deep foundations.
- **Low permeability:** Protects against water ingress and chemical deterioration, especially in aggressive soil conditions.
- **Extended workability time:** Often required to accommodate long placement durations, especially in large raft slabs or high-temperature environments.

Applications:

- Strip and pad foundations for residential and commercial buildings
- Raft foundations in poor soil or high-load areas
- Deep foundation piles and pile caps
- Footings for bridges, industrial buildings, retaining walls
- Foundations exposed to groundwater or chemical agents

Additives and Options:

- **Water-reducing and retarding admixtures:** Enhance workability and allow time for placement
- **Crystalline waterproofing admixtures:** Improve long-term durability in wet conditions
- **Micro-silica or fly ash:** For added density and reduced permeability
- **10 mm aggregate options:** For dense reinforcement or congested forms

N.P.P. Betomix Ltd supplies ready-mix concrete designed specifically for foundation systems, ensuring structural integrity and resistance to aggressive environmental conditions. Our team provides full support for selecting the right class and mix for each project.

Concrete for Rafts with 10 mm Aggregates

In many foundation and slab-on-grade applications, especially raft foundations with dense reinforcement, the use of concrete with smaller maximum aggregate size (typically 10 mm) is essential. These mixes are engineered for easy flow through tightly spaced rebars and improved compaction in congested areas.

Characteristics:

- **Smaller maximum aggregate size (10 mm):** Facilitates flow and placement in reinforced zones where standard 20 mm aggregate would cause blockages or honeycombing.
- **High workability:** Improved consistency and ease of compaction, especially when combined with superplasticizers.
- **Strength and performance:** Meets the same compressive strength requirements as standard mixes (e.g., C25/30, C30/37) despite smaller aggregate size.
- **Improved finish:** Leaves smoother surfaces with minimal surface defects or voids.

Applications:

- Raft foundations in buildings and industrial structures with dense reinforcement
- Pile caps and structural joints with overlapping rebars
- Slabs requiring uniform compaction and strength throughout their thickness
- Foundation elements in narrow or hard-to-access formwork

Advantages:

- Reduces risk of segregation and incomplete placement
- Enhances concrete compaction and durability in complex structural elements
- Facilitates uniform concrete coverage around reinforcement
- Enables safer and faster casting of dense sections

At N.P.P. Betomix Ltd, we offer concrete with 10 mm aggregates in all strength classes, ensuring maximum performance in demanding foundation and slab works. All mixes are produced under strict quality control with reliable delivery scheduling.

Concrete for Irrigation Networks, Water Tanks, and Swimming Pools

Concrete used in hydraulic works such as irrigation channels, reservoirs, water tanks, and swimming pools must meet strict requirements for watertightness, chemical resistance, and structural durability.

Characteristics:

- **Low permeability:** Essential to prevent water leakage and maintain long-term integrity of tanks and pipelines.
- **Durability in wet conditions:** Formulated to resist continuous water exposure and chemical attack (e.g., chlorine in pools or sulfates in soil/water).
- **Dimensional stability:** Resistant to shrinkage and thermal expansion, preventing cracking and joint failures.
- **Waterproof admixtures:** Often includes crystalline or hydrophobic agents to enhance internal sealing.
- **Workability:** Ensures complete compaction and coverage of reinforcement to prevent leakage paths.

Applications:

- Agricultural irrigation channels and aqueducts
- Underground and above-ground water tanks
- Swimming pools, fountains, and water features
- Pump stations, reservoirs, and cisterns
- Wastewater and stormwater infrastructure

Technical Options:

- Use of silica fume or pozzolanic materials for low permeability
- Retarders and superplasticizers to maintain workability over long casting durations
- Application of curing compounds or surface coatings to prevent early-age drying
- Fiber reinforcement for added crack control in slabs and walls

N.P.P. Betomix Ltd provides tailor-made concrete solutions for all hydraulic and containment structures, offering guaranteed waterproofing performance and compliance with the most demanding technical specifications in Cyprus.

Concrete for Marine Structures – Exposure Class XS

Marine structures are subject to highly aggressive environmental conditions, including exposure to seawater, salt spray, and cyclic wetting and drying. Concrete in these environments must meet stringent durability standards to ensure long service life and protection against corrosion of embedded reinforcement.

Exposure Classes (according to EN 206):

- **XS1:** Exposed to airborne salt (e.g., coastal buildings)
- **XS2:** Permanently submerged in seawater (e.g., foundations, footings)
- **XS3:** Zones in the tidal, splash, and spray zones (e.g., piers, sea walls)

Characteristics:

- **High durability:** Engineered for low chloride permeability to prevent corrosion of reinforcement.
- **Dense matrix:** Achieved through low water/cement ratio and high-performance supplementary cementitious materials (e.g., fly ash, silica fume).
- **Resistance to sulfates and alkali-silica reaction (ASR):** Especially in coastal environments with aggressive chemical composition.
- **Corrosion inhibitors and waterproofing admixtures** may be used to increase protection.

Applications:

- Docks, piers, and wharves
- Coastal retaining walls and sea defenses
- Port platforms, container terminals, and ramps
- Marine foundations and caissons
- Tunnels and infrastructure close to or below sea level

Recommended Specifications:

- Strength class: C35/45 or higher
- Water/cement ratio: < 0.45
- Air-entrainment may be used for resistance to wetting/drying cycles
- Extended curing to promote full hydration and strength development

N.P.P. Betomix Ltd produces certified marine-grade concretes in accordance with European standards, offering full technical support for design and site implementation in harsh coastal and marine environments.

Concrete for Retaining Walls, Ramps & External Pavements

These structural elements are often exposed to varying loads and environmental conditions. The concrete used must ensure mechanical strength, surface durability, and resistance to water, chemicals, and freeze-thaw cycles (especially in exposed areas).

Retaining Walls:

- **Load-bearing performance:** Must resist earth pressure and sometimes hydrostatic forces.
- **Durability:** Exposure to water, soil chemicals, and temperature variations.
- **Workability:** Proper placement and compaction around dense reinforcement are crucial.

Ramps:

- **Slip-resistant finish:** Often requires surface texturing or broom finishes to ensure traction.
- **Sloped placement:** Concrete must be workable but not prone to slumping or segregation during casting.

External Pavements:

- **Abrasion resistance:** For pedestrian and vehicular traffic.
- **Weathering resistance:** Must withstand temperature extremes, wetting, and drying.
- **Surface quality:** Uniform finish with minimal shrinkage cracks and scaling.

Typical Characteristics:

- Strength classes: From C25/30 to C40/50 depending on application
- Exposure classes: XF1–XF4 (freeze-thaw), XC2–XC4 (carbonation), XA1–XA3 (chemical attack)
- Use of air-entraining agents and durable aggregates
- Adequate curing and control joints to limit cracking

N.P.P. Betomix Ltd offers a wide range of concrete mixes for civil and infrastructure works, ensuring excellent performance in retaining structures, ramps, and pavements. We ensure the right balance between strength, durability, workability, and surface quality.

Concrete for Blinding and Non-Structural Use

Blinding concrete is a low-strength concrete layer applied to level and protect the ground before the main structural concrete is poured. While not structural itself, it plays an essential role in construction preparation and precision.

Characteristics:

- **Low to medium strength:** Typically C8/10 to C12/15, depending on site requirements.
- **Uniform consistency:** Ensures a flat, clean, and stable surface for rebar placement and formwork setup.
- **Clean working platform:** Prevents contamination of structural concrete from soil or mud.
- **Protection of membranes:** In cases where waterproofing membranes are used, blinding prevents damage during rebar and formwork installation.

Applications:

- Base layer for footings, slabs, and foundation rafts
- Under rebar to allow accurate placement and cover
- Preparation of trenches before pouring the structural element
- Protection of underground waterproofing systems

Advantages:

- Improves site cleanliness and safety
- Enhances concrete placement accuracy
- Prevents moisture loss from the main slab
- Cost-effective and easy to place

At N.P.P. Betomix Ltd, we provide consistent, reliable blinding concrete for every site condition, ensuring proper preparation for structural concrete applications.

Concrete for Lean Applications (e.g., Pipe Bedding)

Lean concrete is a low-cement-content mix primarily used for non-structural or lightly loaded applications. It serves as a base or bedding layer for various infrastructure installations where full structural strength is not necessary.

Characteristics:

- **Low cement content:** Just enough to bind the aggregate and provide minimal strength.
- **Easy placement:** Flowable yet firm enough to hold shape after compaction.

- **Fast and economical:** Suitable for backfilling, bedding, and trenching.

Applications:

- **Pipe bedding:** Especially in water supply, sewer, or drainage networks. Concrete provides continuous support and protects the pipe from shifting.
- **Trench backfill:** In narrow trenches where soil compaction is difficult.
- **Non-structural infill or levelling layers:** Beneath slabs, pavement foundations, or industrial floors.
- **Mass filling of voids:** Where low strength is sufficient and flowability is important.

Typical Properties:

- Strength class: C8/10 to C12/15
- Density: 2000–2200 kg/m^3
- Pumpable or dumpable depending on the site layout
- May include recycled aggregates or additives for economic and environmental performance

N.P.P. Betomix Ltd offers customized lean concrete mixes that balance cost-efficiency and performance for a wide range of infrastructure needs, helping reduce time and labor on-site while maintaining quality and reliability.