# INNOVATION IN CONCRETE STRUCTURES DESIGN AND CONSTRUCTION pdf

## 1: 8 coolest construction technology innovations of | Construction Dive

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Sullivan New life for and old soldier: Klein Imprived determination of the locations and sized of steel rebars in concrte by S. Popovics Use of sub-surface radar for structural assessment of in-situ concrete by J. Shaw Use of a new glass-fiber rod as reinforcement for concrete structures by O. Aitcin Influence of core dimensions on compressive strength results and their dispersion by A. Leming Fine-grained slag sand and fly ash concrete with higher frost resistance and waterproofness by S. Rekhtin Characterization of mortars as surface repair materials by J. Mirza Role of Rheological properties of concrete in design innovations by W. Roy A classification and quality system for concrete repair mortars by S. Read The improvement of surface layer strength of concrete by using a special curing sheet by T. Saeki Studies of methods to assess the quality of the surface layer of concrete by Y. Sugawara The effect of synthetic fibers in reducing damage to concrete by A. Webster Quality of Concrete for durable structures by D. Cao Durability of new-to-old concrete buildings by F. Pigeon Fundamental studies on inorganic materials for crack injection by T. Yoshida Studies on penetration properties of repair materials for cracks in concrete by T. Umehara Standards activities for protection and repair of structures in Europe by A. M Paillere and B. El Jaizairi Considerations in the use of concrete for offshore structures by G. Hoff Strategies and implementation of structural repairs to high rise housing blocks in hong kong by R. Watkins Non-destructive evaluation of structural concrete with stress waves by L. Olson Major factors influencing the performance of structural repair by Y. Marosszeky An experimental study on abrasion of various concretes due to ice movement by Y. Saeki Design of high strength concrete columns by B. Seng Introduction of a code for design and construction of steel fiber reinforced concrete structures by Z. Ruimin Ductile behavior of high-strength concrete columns confined by high-strength transverse reinforcement by H. Tanaka Development of in-situ nondestructive evaluation techniques for rebar corrosion, concrete deterioration and internal cracks by M. Yuno Flexural behavior of prestressed concrete beams reinforced with aramid fiber reinforced plastic flat bars by R. Amano Improvement of flexural behavior of reinforced concrete sections by combined use of different grade longitudinal bars by F. Ohsumi How to attain full continuity and standardization in composite prestressed multi beam bridges by K. Mirtalaei Study on the application of fiber mixed reinforced concrete for earthquake resistant design by H. Morihama Interference effect on wind loads on tall buildings by A. Mir Flexural behavior of reinforced concrete beams containing steel fibers by B. Lee Influence of Design and construction practices on seismic behavior of reinforced concrete buildings by S. Abdel-Rahman A Study on the bending behavior of repaired reinforced concrete beams using fiber reinforced plastic and polymer mortar by K. Ohki Stability of tapered cantilever beams under torsion by T. Amirsoleymani Use of super high strength rebars as web reinforcement by H. Kanoh Seismic shear strengthening method for existing reinforced concrete short columns by K. Kuroki An experiemental study on the composite precast slab by C. Yoon Development of probability based load and resistance factor design formats for reinforced concrete structures by S. Cho Practical aspects of a rescue scheme for a reinforced concrete building subject to sulfate attack by O. Martin Bearing capacity of a reinforced concrete sixty year old water tower by G. Vesey Bond Development in fiber reinforced plastic grid reinforced concrete by G.

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## 2: SP Evaluation and Rehabilitation of Concrete Structures and Innovations in Design

*Innovation In Concrete Structures Design And Construction Moladi construction technology, the multi award winning moladi construction system was founded in south africa in as a method of building cast in place reinforced.*

At Preload, all of our construction personnel are trained in specific techniques of prestressed concrete tank construction which have been refined over our 80 year history. A solid tank foundation requires thorough subbase preparation. Our engineers carefully review each project to ensure that geotechnical issues are correctly addressed throughout the subgrade and subbase preparation. This allows for a free-draining work area to facilitate construction, and ensures close tolerances in the construction of the finished floor. PIPING Piping for watertight transmission Uninterrupted liquid transmission to and from the tank is vital to the operation of the storage facility. Our detailing and installation of the tank piping results in high quality and watertight service. This type of floor system, in conjunction with a custom-designed PVC waterstop, provides watertightness and the ability of the floor to settle differentially without being subjected to high secondary bending stresses. The result is a reliable, economical, and durable tank structure. Where site conditions necessitate the use of a structural floor, we choose design details and construction compatible with the pile supports, rock anchors, or other deep foundation systems. In either case, our construction methods call for installation of reinforcing steel, and consolidation of properly prepared and tested concrete mixes that render high quality, wa tertight tank structures. RESTRAINT Built to withstand the forces of nature In high-seismic areas or sites with uneven backfill elevations, restraint cables are utilized to minimize lateral displacement of the cylindrical wall relative to the tank footing. Preload pioneered the use of restraint cables in prestressed concrete tank structures. Our restraint system is proven to assure superior tank performance in any situation. These include industry-accepted publications AWWA D and ACI R, used to guide the design and construction of prestressed concrete tanks throughout many parts of the world. Our advanced methods for precasting wall panels and unequaled level of quality control make a Type III design the best option. Panels are constructed in casting beds and then stack-cast in an efficient assembly line process. A steel diaphragm is used as the bottom form in fabricating each panel. The steel diaphragm is vertically ribbed with reentrant channels, providing a mechanical keyway anchorage to the concrete. The individual diaphragm sheets are mechanically lock-seamed. Next, side forms are positioned to form the edges of the panels, vertical reinforcing and lifting inserts are placed, and the concrete is cast and finished. As the concrete is cast, the thickness and cover over the diaphragm and reinforcing steel are positively controlled by the side form system. Each panel is then cured in a high-humidity environment. Once all wall panels are cast, the individual panels are rotated vertically and erected along the perimeter tank footing. The panels are then temporarily braced as the wall construction continues to assure safe construction in nearly any weather condition. The diaphragm is then joined together and joints between the erected panels are filled with shotcrete or concrete. Once the wall construction is complete, the circumferential single wire prestressing is applied. Wall sleeve penetrations that accommodate permanent manholes and through-the-wall piping are made watertight by sealing them to the steel diaphragm. The steel diaphragm is seamed and sealed to form a watertight, impervious barrier from the base to the top of the tank. Mild reinforcing steel is then placed in the wall to resist stresses due to differential temperature gradients and vertical bending moments. Permanent manholes and through-the-wall piping, if required, are accommodated through penetrations made watertight by sealing them to the steel diaphragm. Finally, shotcrete is pneumatically applied to the interior and exterior of the steel shell diaphragm to build out the tank core wall. This process allows efficient construction of the tank wall and is performed by one of our specially trained, ACI Certified Shotcrete Nozzelmen. As a leader in dome roof construction, our time-tested construction methods enable us to construct a high quality dome for your tank for maximum long-term durability. For projects with height restrictions or for fully buried tanks, we utilize a column-supported flat-slab concrete roof. Dome Roof Most Preload tanks feature a spherical shell dome roof The dome roof design is unmatched in its economy and durability. The design results in uniform compression throughout the spherical shell, allowing relatively thin sections of concrete to span large tank diameters. The efficient dome shape provides a low profile as well. Rise-to-diameter ratios of 1: Other rise-to-span ratios are available on request. In constructing the roof, reinforcing steel is placed in perpendicular directions throughout the dome shell. Then, the concrete is placed onto the form, finely screeded and finished to the required spherical shape. A thickened fillet section is incorporated at the dome perimeter to resist the bending moments resulting from shell edge discontinuity. To economize the design, we use column capitals or drop panels that are compatible with the roof design. Our quality-centric construction methods result in an open-top tank with tolerances that will allow the incorporation of any process equipment necessary for your project. Prestressing places the entire tank wall into a state of permanent compression. This prevents the cracking and leaking associated with other types of tank structures. Prestressing the dome edge keeps the dome in compression, enabling the use of large free-spanning concrete domes. The prestressing wire is applied around the tank in a continuous helix, using specially designed machines capable of exceeding industry standards and meeting our own stringent quality requirements. These machines allow us to maintain a consistent force in the wire while also maintaining a minimum clear distance between individual prestressing wires to ensure that every wire is fully encapsulated in shotcrete. Encapsulating individual wires and applying them helically eliminates the need for buttresses and anchorage zones. This benefit is found only in wire-wound prestressed tanks, resulting in superior reliability and durability. Concrete is applied pneumatically in a process called shotcreting. The cover coat is applied by our skilled ACI certified shotcrete nozzlemen, thus ensuring high quality construction in the finished tank structure. The final surface of the cover coat is architecturally finished by applying either a natural gun or a steel troweled finish to produce a durable and aesthetically pleasing tank structure for the community. After the construction of the tank is complete, accessories are added to complement the tank structure based on specific project requirements. Accessories such as exterior and interior ladders, roof handrail systems, vents, natural and forced draft aerators, personnel and equipment access hatches, and wall manholes are available and easily incorporated into the design of the tank. Accessories are fabricated from the highest quality materials available, to provide durability and low maintenance for the life of the tank structure. Like the tanks themselves, accessories are designed to comply with all applicable local, state, and federal regulations. We build Preload tanks in diverse configurations â€” including at grade, partially buried, or fully buried â€” to satisfy your profile preferences and accommodate specific site conditions. Additionally, with a Preload tank you can select from a wide range of colors and geometric alternatives, as well as exterior treatments to blend with nearby structures and the surrounding environment. Choose from such architectural treatments as: Whichever treatment you choose, you can count on Preload to build the tank that fits best in your environment. Preload wire-wound, prestressed concrete tanks are the ideal storage solution for water, storm water, wastewater treatment, thermal, biofuel, and LNG Tanks.

## 3: Design & Construction | Preload

*the experimental research and analysis of the friction forces of the earth acting on the anchor bar of anchor bridge dais.*

The system combines a Greenguard-certified, low-alkali, self-leveling cement-base technology with a computer-controlled pump truck. At Swedish Hospital, the system eliminated concerns about flatness inherent to concrete slab work with structural steel buildings. When officials asked that the schedule be cut to 10 months so students could move in for the fall term, the Building Team knew concrete drying posed a potential problem. Aridus Rapid Drying Concrete , a ready-mix formulated to help prevent moisture-related flooring failures, was selected for its combination of fast drying time, high early strength, compressive strength, and low permeability. The project required 20, cubic yards of concrete, including 5, cubic yards of Aridus used to cover , sf of floors. Crews were able to install final flooring 21 days after the concrete was poured, compared with a typical drying time of at least four months. On the Building Team: The system consists of panels of expanded polystyrene foam, placed within the wall forms before the pour and held in place by a patented web structure that becomes embedded in the concrete. The resulting walls thus consist of a concrete layer and an attached insulation panel, with fastening strips on the exposed face to facilitate application of drywall or other finish materials. Depending on the thickness of the concrete, R-values range from 9. North American Specialty Products 4. The first 40 floors required 38, cubic yards of a special mix, providing compressive strength of at least 12, psi. BASF estimates that  The resulting composite exhibits good thermal insulation and excellent thermal inertia, according to the manufacturer, creating environments that need minimal heating or cooling. The material has negative embodied carbon because CO2 that is captured by hemp as it grows is ultimately sequestered within the Hemcrete. Several design and construction methods are appropriate, including direct application to timber-framed structures and use with a rainscreen system. Because proper on-site drying can be tricky, the company recently developed systems that incorporate the material in factory-made panels, including Hembuild for low-rise buildings and Hemclad for large-scale buildings with a primary structural frame. American Lime Technology 6. Usable for both metal and concrete surfaces, the coatings resist damage from ultraviolet light, chemical spills, and abrasion. They have ultra-low VOC emissions and high color stability and cleanability, according to the manufacturer. Formulations offer a fast curing time, with a typical start-to-finish cycle that fits within an eight-hour work day. The coatings can be applied over stains for attractive effects. Appropriate commercial projects include hotels, restaurants, retail space, healthcare, and other facilities with concrete floors. The tiles include the photocatalyst titanium dioxide, which oxidizes with vehicle-emitted NOx and removes it from the atmosphere. The benign precipitate resulting from the chemical reaction washes away in the rain. The technology also uses naturally occurring UV light to help break down organic substances that can occur on roofs, such as mold and algae. Additional benefits cited by the manufacturer include high thermal mass, emissivity, and reflectivity, and an insulating air space between the tile and the roof deck. At the end of their service life, the tiles can be recycled for new structures or roadways. Water pooled on the floors of the risers every time it rained, increasing the risk of concrete damage and forcing fans to cope with the puddles. The product was feather-edge sloped over the concrete flooring to fill in areas where pooling had typically occurred. Consolideck LS features a lower viscosity and more highly reactive silicates than conventional sodium or potassium silicate hardeners. These characteristics help the formula penetrate more deeply into the surface. Higher reactivity aids hardening without the aggressive scrubbing and rinsing needed with conventional hardeners, according to the manufacturer. Consolideck LSGuard is a high-gloss sealer, hardener, and densifier that further increases sheen, hardness, and stain resistance of floors treated with Consolideck LS. It produces a high-gloss finish that maximizes light reflectance, eliminating the need for floor waxes, liquid polishers, and conventional resin coatings.

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## 4: Concrete solutions: 9 innovations for a construction essential | Building Design + Construction

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## 5: Seawalls | Innovative Marine Structure

*Innovation in Concrete Structures: Design and Construction forms the proceeding of the three day International Conference held during the Congress, Creating with Concrete, September , organised by the Concrete Technology University.*

## 6: 8 Innovations That Will Rock Your Next Concrete Project | Building Design + Construction

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