

CONCRETE SIKA SOLUTIONS FOR DAMS & HYDROPOWER PLANTS

BUILDING TRUST





SYSTEM SOLUTIONS AND KNOWHOW – SIKA IS YOUR ONE-STOP PARTNER FOR DAM CONSTRUCTION AND REFURBISHMENT

Since centuries dams have always played an essential role to store water for different purposes, such as irrigation, water supply, hydroelectric power and flood control.

Sika has for more than 80 years experiences in many of the most challenging dam projects around the globe, and today Sika supplies innovative solutions for all of the largest and technically most complex dam and hydropower schemes. Our fully integrated systems and innovative solutions are sustainably produced, tested and well proven in practice, our experienced engineers are committed to excellence in onsite services. Sika provides owners, specifiers and their contractors, the security of clearly defined performance characteristics for their specific project's site conditions and design requirements.

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SIKA FULL RANGE SYSTEM SOLUTIONS FOR CONSTRUCTION AND REFURBISHMENT

SINCE 1910, SIKA HAS been a reliable partner on construction projects in almost every part of the world and has gained an enviable reputation for quality products and system solutions, all backed up by unrivalled technical expertise and support. Dams are structures that present particular challenges and complexities. Sika's specialists understand these and provide advice with problem solving solutions to safely and securely meet all of the necessary design, construction and in-service performance requirements, for both new build and refurbishment projects. Sika solutions make a positive contribution to the overall performance of all types of hydraulic structures, whilst also potentially reducing both construction and operating costs.

Sika provides a single source for integrated and compatible solutions from basement to roof in the following areas:



ADMIXTURES FOR CONCRETE AND SHOTCRETE



WATERPROOFING



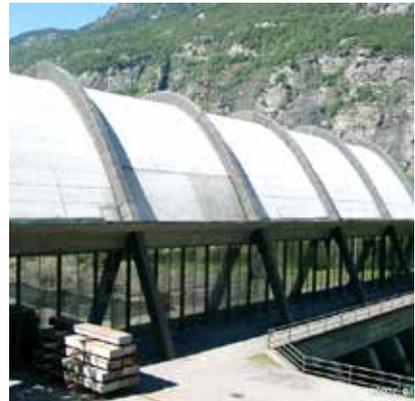
CONCRETE PROTECTION AND REFURBISHMENT



SEALING, BONDING AND STEEL PROTECTION



FLOORING



ROOFING

WORKING IN PARTNERSHIP WITH SIKA

Sustainability – Sika’s commitment to our product development and your projects includes Life Cycle Assessments (LCA) according to ISO 14040 and EN15804. Sika has clear objectives with targets for achieving a sustainable future in all aspects of our business.

Compatibility – A systems approach to ensure integrated, high performance and durable solutions.

Simplicity – Buildability, meaning ease of use, to ensure successful installation without complications.

Dependability – Sika’s commitment to quality and ensuring reliable, long-term performance in use, throughout the required service life.

Flexibility – The full range of Sika products and systems is designed and produced to allow alternative options and the right choice for each project, with opportunities for value engineering at the design stage.

Support – Unrivalled technical and practical support throughout the project cycle from concept and design to completion and maintenance including recyclability.

SIKA AT A GLANCE

- Local presence all around the world, now in more than 100 countries
- Employing > 20,000 employees
- The widest range of products and systems for our Key Target Markets

All of this combines to mean that you are collaborating with the global market leader, who will work with you, using our expertise and experience to arrive at the best solutions for your project, wherever it is in the world. Sika has product engineering specialists located in each of our global regions to support you.

PROJECT SUPPORT



Health & Safety



Single Source Supplier



Objective Approach to Specification



Quality Products & Market Leading Solutions



Buildability and Compatibility



BIM Objects



Maximizing Value



Risk Management



Single Point of Contact



Time and Cost Saving Solutions



Life Cycle Sustainability Analysis



Support through the project cycle

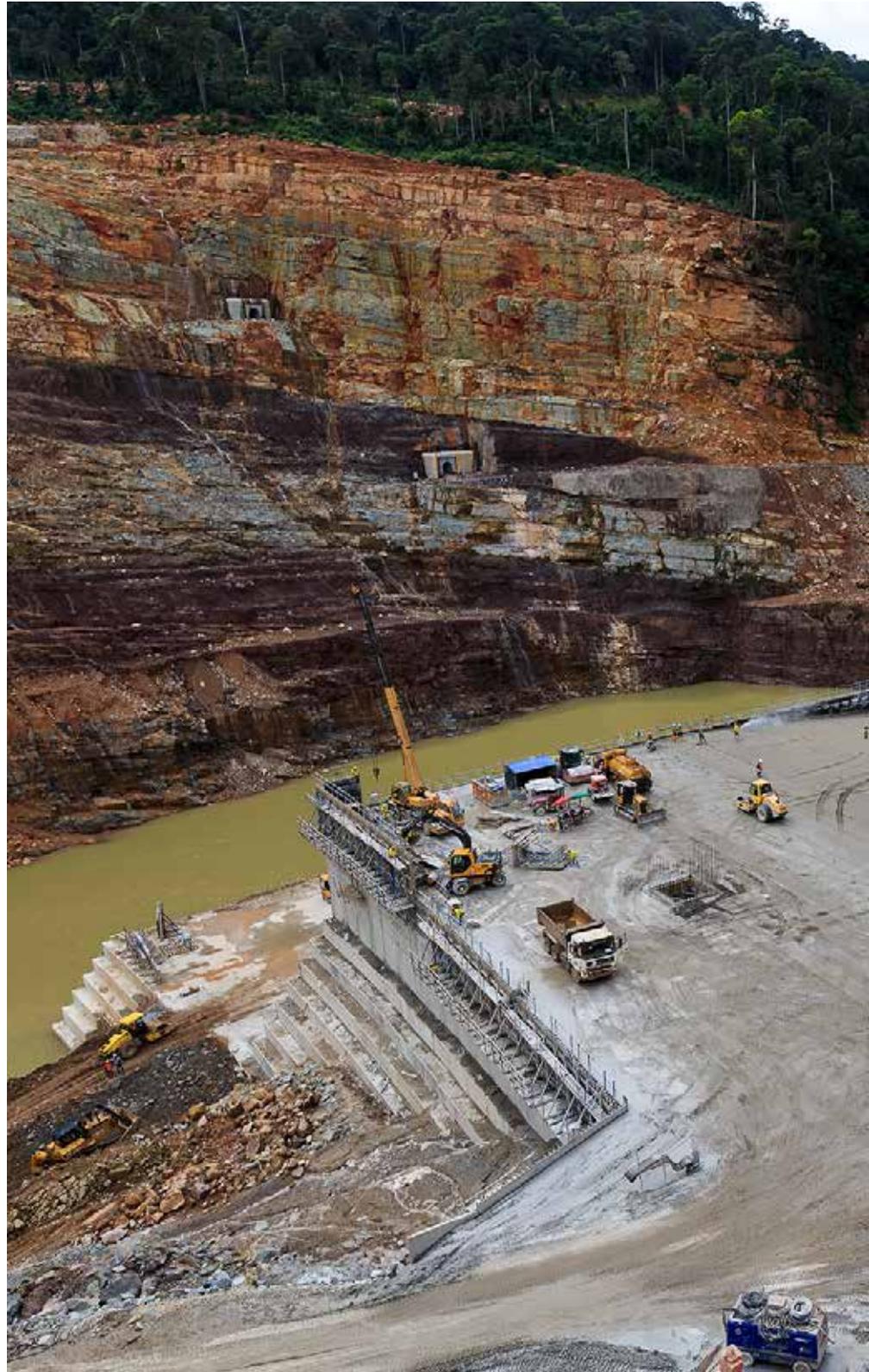
EARLY ENGAGEMENT TO ACHIEVE BEST VALUE

THE CONSTRUCTION OF DAMS

FROM EARLIEST TIMES

PEOPLE have created dams, probably copying nature and the beavers or natural events for example, by constructing a barrier across a river valley to contain the flow of water and creating a reservoir behind it.

Dams can bring a variety of benefits ranging from improved and controlled agricultural irrigation, clean water supply, flood protection, river navigability and more recently electricity power generation. The engineering technology to create and maintain dams to ensure the supply of fresh water from reservoirs for regular and / or variable demand patterns has long been a vital part of human settlement and civilization. Dams have played a key role since at least the third millennium BC when the first great civilizations evolved on major rivers, such as the Nile and the Indus. Nowadays there are about 60,000 "large dams" (defined as ≥ 15 metres high) in over 150 countries worldwide, as well as a much larger number of smaller ones. The main function of dams can generally be grouped into two categories, single purpose and multipurpose. Today agricultural irrigation and hydroelectric power, also known as hydropower generation, are by the far the most common functions for dams.





TYPES OF DAMS BY CONSTRUCTION MATERIALS

Each dam is different; the design and construction material used are largely dependent on the size and shape of the river and the valley. Dams can be made from two main types of materials:

- **Earth dams:** including earth-filled, rock-filled and concrete faced rock-filled (CFRD) dams, also called embankment dams
- **Concrete dams:** including conventional concrete (CVC) and roller-compacted concrete (RCC) dams

Earth- and rock-fill dams generally have a solid core of impermeable clay in the middle to prevent water leakage and an outer layer of rock or concrete sections for strength. Concrete dams are made of high strength, solid concrete walls designed to resist the pressure of water required. Roller-Compacted Concrete is now one of the most widely used technologies for dam building today, because it effectively combines the performance of a concrete and the ease of construction of an earth dam.

CONSTRUCTION ELEMENTS OF A DAM

Each dam site is precisely selected according to the surrounding topography, existing hydrological regimes, plus the prevailing environmental and social constraints, amongst other boundary requirements and conditions. In addition to the main dam, several other major structures, sometimes called the appurtenant facilities, are necessary to allow and ensure full operations. For example on larger dam schemes such as hydropower plants, many secondary structures ranging from the spillways to the powerhouse, penstocks and galleries are included.

AN OVERVIEW OF SIKA SOLUTIONS FOR DAMS AND HYDROPOWER PLANTS

TODAY THE LIVING CONDITIONS of billions of people are undoubtedly improved and supported by the construction and maintenance of dams. New dams are being planned all around the globe in order to address the escalating water crisis and increasing electricity supply demands

Dams are an essential part of modern infrastructure and this is especially true in developing countries, which are growing at a faster rate. This means continually being able to provide more water by building new large dams, and even more frequently, extending and refurbishing existing ones. Recent surveys in Europe and North America have shown that the majority of existing dams already exhibit significant degrees of degradation. Many of them are therefore in



need of substantial repair and refurbishment. Based on our extensive knowledge and experience in large dams and the hydropower industry, Sika provides a full range of products and systems for construction solutions on dams from the base foundations to the crest. The graphic below illustrates some of the key areas in dam projects and the key Sika solutions as outlined in this brochure.



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MAIN DAM

OVERVIEW

Dams can be exposed to a wide range of stresses and strains, starting internally with the thermal stress resulting from mass concrete construction, the high static and dynamic loadings, the hydrostatic water pressure in construction and in service, plus additional seismic forces in many regions. The construction materials have an essential role in being able to resist all of these forces. Conventional concrete dams are obviously stronger and more stable than earth dams, but at the same time they are also much more expensive. Roller-Compacted Concrete technology uses a concrete with “no-slump consistency” that, in many cases today, provides the most cost effective construction material for dam building.

Sika's extensive expertise and long-term experience with this technology and processes comes from our involvement in many large RCC projects around the world, including the Alpe Gera dam (Italy) and the Tarbela dam (Pakistan), which are generally recognised as the world's first two major RCC dam construction projects.

REQUIREMENTS

- Highly durable concrete with reduced permeability and excellent performance classifications
- Extended workability and increased setting time in order to complete the placing procedures (essential for RCC)
- Correctly engineered and practical sealing solutions for each and every type of joint in the structure
- Highly durable grouting products
- Steel protection solutions to reduce corrosion in CVC structures





SIKA SOLUTIONS

FOR CONVENTIONAL (CVC) AND RCC DAMS

Concrete Construction	Water reduction and plasticizing with Sika® Plastiment® (recommended for RCC dams) and Sika® Plastocrete® technology, to increase setting time and enhance workability of the concrete.
	High range water reduction and plasticizing with Sikament® technology (recommended for CVC dams), to provide enhanced strength development and controlled workability.
	Sika Control® AER to increase the frost and freeze/thaw resistance for dams exposed to extreme climatic conditions Sika® Antisol® for controlled curing of the concrete to significantly enhance durability.
Corrosion Protection	Sika® FerroGard® corrosion inhibitor to prevent the corrosion of steel reinforcement.
Waterproofing	Sika Waterbar® flexible PVC waterstops for the integral sealing of movement and construction joints in watertight structures. Sika Waterbar® are available in a wide range of different types, shapes and sizes to suit different types of structures and joint sealing applications.

FOR EARTH DAMS

Concrete Construction	Water reduction and plasticizing with Sika® Plastiment® (for CFRD dams) and Sika® Plastocrete® technology, to increase setting time and enhance concrete workability.
	Sika® ViscoCrete® technology for highly workable shotcrete with improved rheology and pumpability.
Grouting	SikaGrout® series for grouting in and around the foundations, plus to fill voids, holes and cavities in the hardened concrete, or for embedding drainage pipes and other penetrations and elements.

SLOPES STABILIZATION

OVERVIEW

One of the many applications of shotcrete is slope support. Slopes are generally designed so that the rock mass can support itself, but frequently this requires additional support. Shotcrete is also ideal for slope stabilization due to its ease of adaptation to site profiles and requirements, its capacity to stick to the rock and its high early strength and resistance. As shotcrete is spray applied, the material is compacted against the surface to also fill any cracks and prevent any loose materials from falling. Shotcrete therefore provides a protective coating over the slope's surface and also helps to consolidate and stabilize or 'anchor' the surface. In addition, drainage systems such as Sika FlexoDrain can be fixed into and onto the slope with



shotcrete and these are also important for ensuring future stability.

SIKA SOLUTIONS

CONCRETE CONSTRUCTION

Specialist shotcrete products, systems and equipment solutions using: Sika® Sigunit®, Sika® ViscoCrete®, SikaTard®, SikaPump®, SikaTell®, SikaFiber®, SikaFume®, Sika® Aliva®, and Sika® Shot.

SLOPE SURFACE SEALING

Sika® Injection technology using flexible polyurethane and acrylic resin based injection systems.



SPILLWAY AND INTAKE STRUCTURES

OVERVIEW

The intake structures, including the spillways, are some of the associated secondary structures that are required as well as the main dam itself in a hydropower plant. These structures are usually reinforced concrete structures and are used to collect water from the reservoir. The type of intake structure generally depends on its location and function as well as the other associated hydraulic structures that make up the plant, such as concrete towers and artificial banks, etc.



SIKA SOLUTIONS

CONCRETE CONSTRUCTION

For construction of the associated reinforced concrete structures, Sika produces a large variety of concrete admixtures and ancillary concreting products. This includes plasticizers, high range superplasticisers for improved workability, strength and durability, set and hardening accelerators for a faster production process, plus mould release agents for easy de-moulding of formwork in-situ. SikaFiber® can also be used; these special fibres are incorporated in the concrete mix to improve the performance and durability of concrete and mortar. They can specifically increase energy absorption and fire resistance, whilst reducing shrinkage cracking, fracture formation and crack-widths. Sika® Antisol® curing compounds are also used to achieve higher durability as they protect horizontal concrete surfaces against excessive evaporation and promote full curing, especially at the surface.

GROUTING TO FILL VOIDS

Sika grouting technologies include systems with cementitious, epoxy and polyurethane resin based binders. Engineering grouts are designed to completely fill voids and transfer load directly within the concrete structure. SikaGrout® and Sikadur® are ideal for filling both vertical and horizontal joints between structural elements as well as for sealing voids and areas of honeycombing for example.

SURFACE PROTECTION

Protecting the surface of the dam and its associated structures prolongs the service life and can prevent expensive damage and outages, or the need for costly repairs. Protective concrete coating systems are also used to enhance and maintain the visual appearance, with Sika products and systems developed to suit all of the relevant water and hydropower industry regulations and service conditions. The Sikagard® range includes penetrating hydrophobic impregnations, as well as both rigid and flexible protective coating systems, which are proven to protect concrete surfaces from the ingress of water and aggressive

atmospheric influences. SikaCor® and Sika® Permacor are high performance steel corrosion protection products and systems designed for use as internal linings for tanks and penstocks etc., as well as to protect externally exposed steelwork in all kinds of aggressive environments.

BONDING STRUCTURAL ELEMENTS

Elements such as precast concrete units must be structurally bonded together to provide a rigid bond between them that is able to directly transfer load. Sikadur® epoxy adhesives are widely used to very effectively bond concrete elements together in this way, including for segmental bridges and water retaining structures, where they also provide a secure watertight seal. The Sikadur® products and systems also have many other concrete bonding and sealing applications, plus with excellent adhesion to many other materials, they can be used for rigid structural bonding on many different substrates.

UNDERGROUND WORKS

OVERVIEW

Tunnels are usually required in dam building projects where the topographical conditions prevent simple open-channel construction. For example, water diversion tunnels are commonly some of the additional structures required on large dam projects. When a dam is to be built, a tunnel is frequently bored first, in order to divert water away from the actual dam construction site itself and so that it essentially bypass-

es it. The Sika product range for tunnels and below ground construction is absolutely extensive and the fruits of more than 100 years of specific experience, continuous improvement and innovation in tunneling. This huge product range comprises all the latest technologies to provide the best and most cost effective solutions for your projects.

SIKA SOLUTIONS



CONCRETE

Sika® ViscoCrete®
Superplasticizers

Sika® ViscoFlow®
Slump retainers

SikaRapid®
Accelerators

Sika® Stabilizer
Viscosity control agents

SikaPump®
Pumping aids

SikaPump® Start-1
Lubricant

SikaFume®
Silica fume

SikaFiber®
Micro & macro synthetic and steel fibers

SikaCare
Equipment protection



SHOTCRETE

Sika® ViscoCrete®
Superplasticizers

SikaTard®
Shotcrete retarders

SikaPump®
Pumping agents

Sika FlexoDrain
Water drainage system

Sigunit®
Accelerators

SikaFiber®
Micro & macro synthetic and steel fibers

Sika® Aliva®
Sprayed concrete machines

Sika® Shot
Ready mixed gunite



WATERPROOFING

Sikaplan® WT
TPO based sheet waterproofing membrane systems

Sikaplan® WP
PVC based membranes

Sika® WT/WP/Dilatec
Preformed, bonded tapes for waterproof connections and terminations

Sika® Waterbars
Joint waterproofing systems

SikaSwell® P
Hydrophilic swelling profile for joint sealing

SikaFuko®
Injectable hoses for joint sealing and secondary / back-up waterproofing

Sika® Injection
Resins for post-applied waterproofing by injection



INJECTION

SikaFix®
Fast, reactive injection products that expand with or without contact with water, mainly injected using a two-component pump. The SikaFix® range is designed for immediate water-stopping under high water flow and hydrostatic pressure conditions.



TBM SOLUTIONS

Sika® Foam TBM
Complete range of TBM soil conditioners and polymers

Sika® Stabilizers
Special main drive and tail sealants

Sika® Set
Accelerators for controlling the set of backfilling grouts



BACKFILL ADMIXTURES

Sika® Retarder
For retarding and stabilizing backfilling grouts



GROUTING

SikaGrout®
Complete range of high-performance, cementitious grouting systems

Sikadur®
Complete range of epoxy grouting systems

Icosit® KC Range
Two-component, polyurethane resin grouts, especially designed for fixing rail tracks and heavy machinery to reduce vibration and noise transmission.



CONVEYOR BELTS

SikaBond® R&B-100
High performance, two-component elastomer for fast and durable conveyor belt repairs

SikaBond® R&B-200
Structural adhesive with a short open time for bonding rubber materials

SikaBond® R&B-210
Structural adhesive with a long open time for bonding rubber materials

POWERHOUSE

OVERVIEW

The main powerhouse hosts the turbines, generators and their necessary auxiliary equipment and the size of the structure obviously depends on the dam design and the types, dimensions, and number of generating units installed. The building is usually a large reinforced concrete structure having three distinct areas: the main powerhouse or generator room, the erection bay for transformer tanking and un-tanking, plus the service area, which generally includes the main control room, offices and other areas for auxiliary equipment.

SIKA SOLUTIONS

CONCRETE CONSTRUCTION

Powerhouse building structures are normally built with reinforced concrete. Sika provides the widest range of concrete admixtures and additives to help ensure that the concrete can meet the project requirements and various standards. Typical admixtures include Sika® ViscoCrete®, Sika Control®, SikaRapid®, and so on. Typical applications are water reducing admixtures, set controlling admixtures, workability improving admixtures, durability admixtures and essentials to improve the quality of concrete.

FLOORING

Floors in powerhouse need to be mechanically resistant because of the maintenance work or forklift traffic, sometimes there is oil on the floors.

For these exposures, normally epoxy flooring is specific to protect the floors. For floor areas where there is strong vibration, polyurethane flooring is more proper. Sika is a global technology and market leader in durable seamless flooring technologies. Typical systems for the above requirements are Sikafloor® MultiDur or Sikafloor® MultiFlex.

ROOFING

Sika is a roofing system solution provider that covers a wide range of applications and technologies to the latest standards. With over 50 years of history, our roofing solutions are renowned for their durability and premium qualifications. Typical systems are Sarnafil® and Sikaplan® single ply membrane systems, and SikaBit® bituminous membrane systems.



PENSTOCK & GATES

OVERVIEW

The dam penstocks are large pipes that control and convey pressurized water to the powerhouse turbines. These can be designed and positioned to run along at ground level, or below ground as a buried pipe, principally depending on the topography and geology of the site. There are two different layouts that are commonly designed and used, which are to have a separate penstock for each generating unit, or a larger penstock with branches into each of the generating units from close to the powerhouse. Penstocks themselves are usually made of steel, but plastic and concrete sections can also be used. Powerful gates and mechanical filters are essential to avoid any solid materials that may be picked-up, from entering and damaging the electromechanical generation equipment of the turbines.

SIKA SOLUTIONS

STEEL PROTECTION

Sika® Poxitar® F

This is an extremely mechanically and chemically resistant protective coating system for steel and concrete surfaces that is used extensively for the internal

Sikagard®

This is a large range of two component epoxy resin coating systems that are widely used for many different protective coating applications internally and



externally on penstocks, in and around the dam powerhouse and on ancillary structures. These solvent-free, well proven materials provide a durable protective coating and can also be used on adjacent concrete surfaces to provide overall protection against mechanical wear and chemical exposure, as well as an impermeable barrier to water penetration.

GROUTING

For grouting of heavy machinery, equipment and base plate with subsequent high resistance to dynamic loading, heavy impact and vibration, even under water, Sika supplies:

- SikaGrout® range of high performance, cementitious grouting systems
- Sikadur® range of epoxy grouting systems

penstock linings and hydraulic gates all around the world. These reaction hardening materials are based on an epoxy-anthracene oil-combination and can be exposed to water immediately after application, which means they are also ideal for mechanical damage repairs and penstock maintenance with minimum downtime.

DAM REFURBISHMENT

OVERVIEW

Ensuring dam safety allows to protect the people's lives and property and to foster the development of the society. However, existing dams can be vulnerable to severe hazards such as floods and earthquakes, and even small defects in dams can lead to significant damages due to service and environmental conditions. Concrete cracking is the deficiency most often reported. Other major problem areas are seepage, spalling and abrasion especially on spillway. Since many of the existing dams today are operating beyond their normal 50-year service life and will have to continue to be operable, there is a great need for solutions concerning the repair and rehabilitation of these structures.

Sika is considered the industry leader on a worldwide basis in concrete repair, protection and refurbishment. Many years of research and development plus decades of practical experience has enabled Sika to provide systems to restore and rehabilitate dams that have deteriorated due to corrosion, abrasion, structural damage, water infiltration, freeze/thaw, seismic activity and others.



TYPICAL PROBLEMS IN DAMS:

- Cracks in the dam body
- Leakage in intake gate
- Leakage in draft tube
- Leakage in inspection gallery
- Abrasion of spillways
- Cavitation in peripheral walls
- Damages to baffle blocks
- Abrasion and impact damages on spillway and the stilling basin

THE STEPS FOR A SERIOUS REFURBISHMENT PLAN

Collection of the project information

Survey and assessment of the structures

Identification and classify of the cause(s) of damage (e.g. basic damages or abrasion)

SIKA SOLUTIONS

STRUCTURAL CRACKS INJECTION

**Sikadur®-52, Sikadur®-451
Sikadur®-53**

Epoxy low viscosity crack injection materials for dry or moist fine cracks (0.2 mm); Epoxy grout water displacing for cracks (> 0.5 mm) filled with water (without pressure).

CONCRETE REPAIR

Sika MonoTop®, SikaTop®

Complete range of cementitious polymer modified mortars, for the repair of concrete structures.



Determination of repair and protection objectives and options

Selection of appropriate repair principles, methods and materials

Implementation of the repair and protection work

Schedule for future inspection and maintenance

ABRASION RESISTANT REPAIR

Sika MonoTop®-3400 Abraroc

Especially developed as wet abrasion resistant mortar for the repair of spillways, stilling basins, water channels, etc..

CONCRETE PROTECTION

Sikagard®, Sika® FerroGard®

A range of hydrophobic impregnation, rigid and flexible protective coatings to protect concrete structures against ingress of deleterious elements; a range of surface applied corrosion inhibitors and galvanic anodes to prevent/reduce corrosion of embedded reinforcing steel.

ANCHORING

Sika AnchorFix®-3001

Special structural adhesives for anchoring all types of fittings and equipment to structures such as for the installation of cable trays or other services, drainage pipes, inspection access equipment, etc., according to European and American standards.

CASE STUDIES

KARAHNJUKAR HYDROELECTRIC PROJECT, ICELAND

PROJECT DESCRIPTION

The development of the Kárahnjúkar Hydroelectric Power Station entails the harnessing of two glacial rivers, the Jökulsá á Dal and Jökulsá i Fljótsdal. The whole project in this region of Iceland was exposed to extreme climatic conditions. The project included the following major structures:

The Háslón Reservoir and 3 Dams:

The main Kárahnjúkar dam (CFRD type) with a dam wall height of 193 m, together with two smaller saddle dams – with a dam height of 60 and 25 m, respectively.

The Ufsarlón Reservoir and Dam:

the Ufsa dam that has a height of 32 m was formed to create the Ufsarlón reservoir.

The Headrace Tunnel and Penstocks:

Water is carried from the Háslón reservoir through the underground headrace tunnel (length 39.8 km and diameter approx. 7.2 m) eastwards to a junction with another tunnel (length 13.3 km and diameter approx. 5.5 m) from the Ufsarlón reservoir.

The Underground Power Station:

The Power Plant itself is also located underground and this structure is approximately 115 m long, 14 m wide and with a maximum height of 34 m.

The fill material of these dams has a total volume of approx. 13 million m³, which had to be prepared on site, then placed and compacted to ensure water-tight structures. The headrace tunnels were mostly excavated using a “full-face” tunnel boring system (TBM) with a diameter of 5.5 – 7.2 m; the others were built using the “drill and blast” method for cross sections of 5.8 × 5.8 m and 7.2 – 7.6 × 8 m.

SIKA PRODUCTS

- Sigunit®-L53 AF (IS)
- Sigunit®-P1 AF
- Sika® ViscoCrete®-SC 305
- Sika® Plastiment® LA-100
- SikaFiber® 65/35
- Sika® PM-400 – Sika-Putzmeister spraying systems
- Sika® Aliva®-278 shotcrete pumps
- Sika® Aliva®-403 accelerator dosing unit
- Sika® Aliva®-285 rotor machines

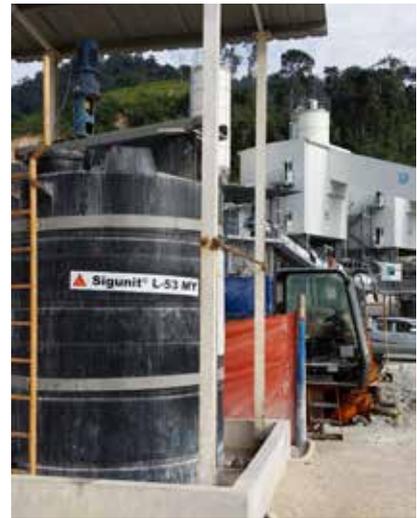


ULU JELAI HYDROELECTRIC PROJECT, MALAYSIA

Tenaga Nasional Berhad (TNB), is the major power utility company in Malaysia, and it has constructed a new hydropower plant in the Ulu Jelai District, State of Pahang in Malaysia. This project involved the construction of an accumulation reservoir and hydropower plant with a total capacity of 382 MW. This project will increase the share of clean, renewable electricity in Malaysia hence reducing greenhouse gas emis-

sions. Water from the reservoir is transferred to the underground powerhouse through a headrace tunnel with concrete invert for the power generation equipment. The plants key structures include:

- 90 Metres high roller-compacted concrete (rcc) dam
- Power intake tower
- Concrete lined surge shaft and surge tank
- Underground powerhouse
- Transformer and surge chamber cavern
- Water transfer tunnels (16 kilometres, excavated by tbm)
- Additional tunnels (headrace tunnel, tailrace tunnel, main access tunnel and service tunnels approx. 10 km in total)
- Generation control building
- Access roads



SIKA PRODUCTS

- Sigunit® L-53 MY
- Sikament®-163 MY
- SikaFibre CHO 65/35 NB
- Sika® ViscoCrete® SC-315 MY
- Plastiment® TM-21
- Sika Friazinc R
- Sika MonoTop®-620 MY
- SikaFuko® VT-1
- Sika AnchorFix®-S
- SikaGrout®-214
- Sika® Latex
- Sika® Antisol® A
- Sika® Formol EX
- Sika® Intraplast® Z
- Sika® Rugasol® G
- SikaFuko® Swell-1
- Sikagard®-62 MY
- Sikadur®-43/42
- Sika® Waterbar O-25 M
- Sikacrete® Gunite-103



PROJECTS ALL OVER THE WORLD

NEW DAMS

GIBE III HYDROELECTRIC PROJECT, ETHIOPIA



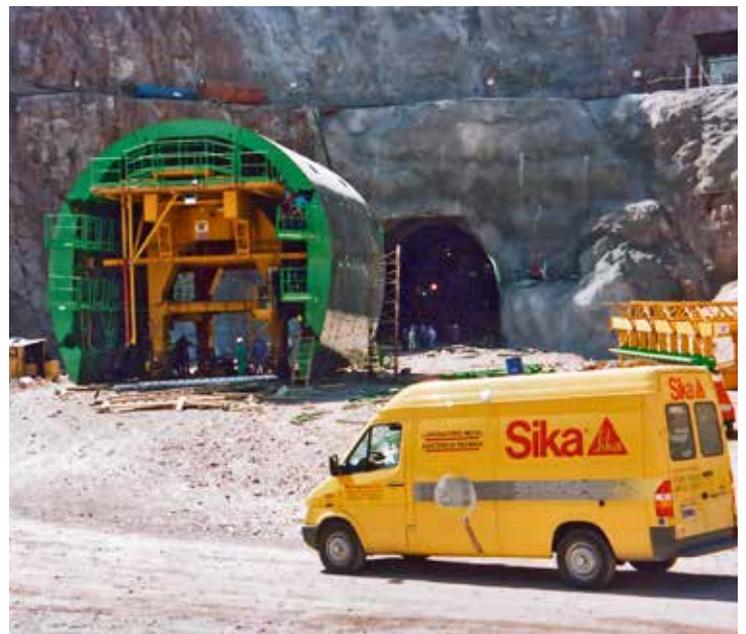
SON LA HYDROPOWER PROJECT, VIETNAM



TONA DAM, COLOMBIA



POTRERILLOS HYDROELECTRIC CENTRAL, ARGENTINA



REFURBISHED DAMS

OROVILLE DAM, USA



KÖLBREINSPERRE, AUSTRIA



MANDIRA DAM, INDIA



MOSUL DAM, IRAQ



GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE CONCRETE INFORMATION:



WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



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BUILDING TRUST

