



# Innovative Concrete Solutions



 A member of  
LafargeHolcim



# LAFARGE IRAQ

A MEMBER OF  
LAFARGEHOLCIM

THE POWER OF AN  
INTERNATIONAL  
GROUP

A new leader  
for a new world



 N°1  
 115,000  
 90  
 31.4bn



Lafarge Iraq is a member of LafargeHolcim Group, a global leader in building materials with a local presence in 90 countries and a workforce of over 100,000 employees. For the year 2015, LafargeHolcim Group posted sales of 29.5 billion CHF.

In 2008, Lafarge entered the Iraqi market with cement, expanding to concrete in 2011. It has since established itself as a pioneer across all business lines and become one of the largest non-oil investors in Iraq, operating in cooperation with local business partners such as Faruk Group (cement), 77 Construction & Trading Company (concrete) in Kurdistan and MerchantBridge (cement) in Karbala.

Lafarge Iraq operates three cement plants: the Bazian and Tasluja plants in Sulaymaniyah and the Karbala Cement Plant near the city of Karbala. In Northern, Central, and Southern Iraq, Lafarge Iraq operates 15 RMX-concrete manufacturing sites that serve the general public as well as both private and public organizations.

Lafarge is a customer and end user-centered company that provides its customers with high-quality, innovative, and diverse building solutions.



# CONCRETE OPERATIONS

## RMX CONCRETE PRESENCE IN ALL MAJOR IRAQI MARKETS



**- Country-wide coverage of commercial plants:**

- North: Erbil, Sulaymaniyah
- Center: Baghdad, Karbala, Najaf, Hilla, Wasit
- South: Basra, Nasiriyah

**- Only professional institution operating in multiple Iraqi markets:**

- Large mobile asset base and massive fleet of concrete trucks and pumps that can be rapidly mobilized to support operations and ensure optimal professional service across Iraq

**- Strong logistics capability to move people, raw materials, and equipment across Iraq quickly and cost effectively, facilitated by:**

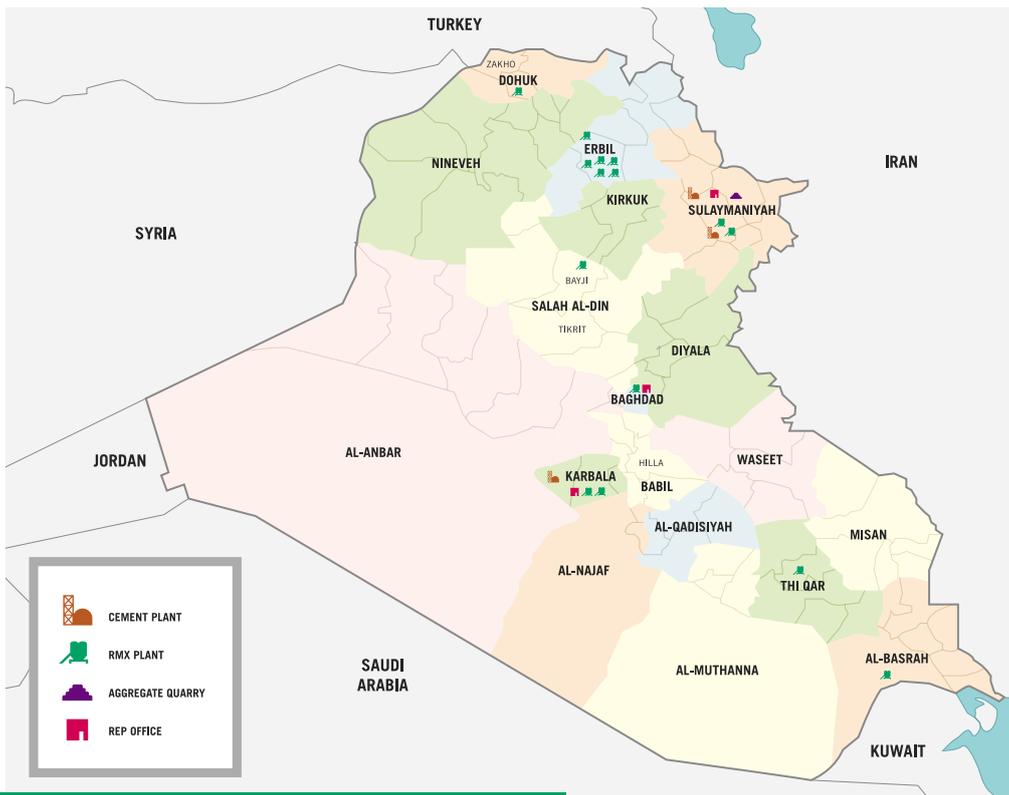
- A well-developed network of local stakeholders
- The ability to perform accurate market research through local connections to mitigate operational risks and meet customer expectations
- Vertical integration in concrete and cement: Lafarge's concrete and cement businesses are leaders in their respective markets

**- International strategic supply agreements with core admixture companies**

**- Well-developed partnerships with local suppliers of spare parts**

**- Consistent supply of quality concrete, cement, and other building materials**

**- A wide array of large-scale infrastructure and residential projects, such as the Karbala Refinery Project, the Bismaya Residential Complex (Baghdad), and the Kobane Bridge (Sulaymaniyah)**



# HEALTH & SAFETY: OUR CORE VALUE



All facets of LafargeHolcim's work are driven by our core values: the health and safety of our staff and local communities. Our Group's international health and safety standards and guidelines are well implemented in Iraq, where they contribute to the overall improvement of industry standards. Our commitment to protecting the health and wellbeing of our employees and local communities is the main guiding principle for Lafarge employees across all tiers. We not only consider ourselves responsible for the wellbeing of our employees, but also for that of our contractors, customers, and anyone affected by our work; thus, our main objective is to develop and maintain top safety standards across all of our operations, including those in Iraq.

LafargeHolcim has a Group Health & Safety Policy and Group Health & Safety Rules, the implementation of which is mandatory for all LafargeHolcim operations worldwide. Group Health & Safety Policy mandates that all work be conducted in a safe and healthy environment, and that we are responsible for our contractors, customers, and local communities just as we are for our employees. The policy's objective is to run harm-free operations and create a safe workplace through a commitment to required safety procedures. We at LafargeHolcim refuse to compromise on any health and safety standards.





## THE 2030 PLAN

# BUILDING FOR TOMORROW

At LafargeHolcim, we aim to achieve sustainability and set standards. We are working to transform the way our industry operates by encouraging the entire construction sector to address our planet's biggest issues. As a global leader in the construction materials industry, we have both the opportunity and responsibility to make significant positive change. The 2030 LafargeHolcim Sustainability Plan focuses on making our operations more sustainable and devising innovative solutions for better building and infrastructure. Our plan transcends our own business activities and seeks to help the industry evolve as a whole. We are thus committed to building partnerships that ensure the entire construction value chain is more innovative and mindful of its use of resources and impact on nature, while remaining committed to improving the lives of communities by providing solutions to their challenges.

Through our sustainable actions, we are committed to having a positive impact on society and the environment, while serving as a model in industrial ecology and sustainability for Iraq. Lafarge Iraq is a pioneer in environmental management systems in the country, and maintains solid relationships with stakeholders. We take the needs and expectations of our local communities into consideration to ensure our role as an active and supportive member of society.



Climate



Circular Economy



Water & Nature



People & Communities

# INNOVATION, QUALITY, AND PERFORMANCE



With the help of the most advanced international research and development facilities, LafargeHolcim has developed a highly innovative range of ready-mix, prefabricated concrete solutions and services. They are designed to help building and infrastructure construction companies overcome challenges related to cost and speed of construction, work-site productivity, architectural and aesthetic visual impact, energy efficiency of buildings, and CO<sub>2</sub> footprint reduction.

As a new leader in the building materials industry, LafargeHolcim has leveraged its high-level research capabilities and experienced industrial know-how to develop the widest range of multi-purpose concrete products and solutions in the market.

LafargeHolcim's **quality, consistency, and reliability** offer **superior concrete performance at local market prices** to meet our customers' most stringent demands, whether applied in buildings or infrastructure. Our clients can also depend on LafargeHolcim's **world-class service, punctual deliveries, and mix design management** to obtain the concrete they need for their construction projects.

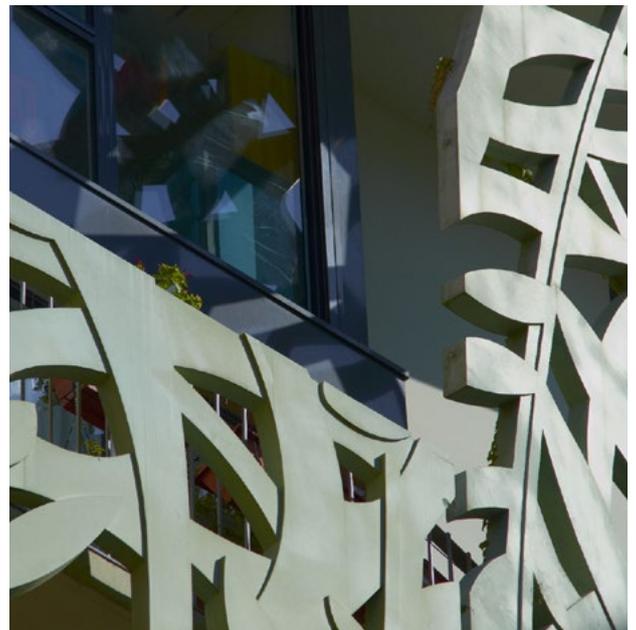
## LAFARGEHOLCIM ULTRA-HIGH PERFORMANCE CONCRETE (UHPC)

High-tech concrete with technical and aesthetic qualities that consistently meet our customers' high standards

With LafargeHolcim's UHPC, **architects and designers can easily create textures, surfaces, and shapes** that were previously too complex for most structural and architectural applications. Our UHPCs, such as Ductal®, enjoy a **combination of high-quality properties**, including:

- **Strength**
- **Ductility**
- **Durability**
- **Impermeability (to protect reinforcing against corrosion)**
- **Enhanced abrasion and impact resistance**

Our UHPC can also be used to **lighten the overall weight of structures**, providing our customers with benefits such as **thinner structural elements**. In this way, our concrete allows for **savings across the value chain** by requiring less material and faster construction through prefabrication.



## LAFARGEHOLCIM INNOVATIVE SPECIALTY READY-MIX CONCRETE

### Self-compacting concretes and screeds for quicker, more efficient worksites

Highly fluid, **LafargeHolcim's self-compacting concretes and screeds considerably improve the conditions and flexibility of worksites** by eliminating the need for vibrating concrete and its associated nuisances. Our solutions, which include Agilia®, Flow Concrete, or Cemflow, can be poured rapidly and effortlessly, and provide a superior surface quality for various applications: foundations, vertical and horizontal applications, screeds, architectural projects, etc.



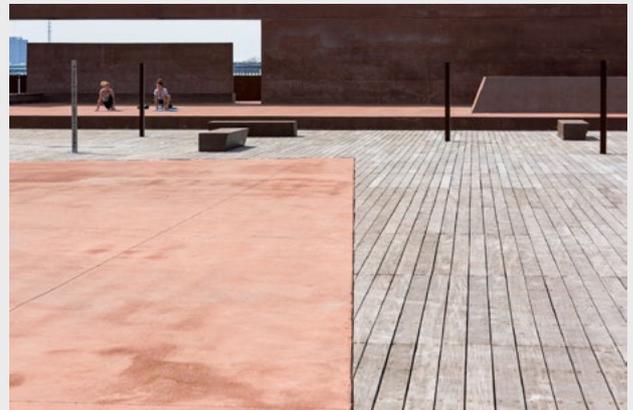
### High early-strength concretes to gain time, reduce cost, and improve quality

The very high early-strength gain and hardening properties of these concretes, such as Chronolia®, allows contractors to benefit from more flexibility in construction planning, safer working conditions, early loading of the structures, and associated cost savings. **Formworks can be removed 3-5 times faster than standard concrete**, resulting in twice as many daily cycles.



### Decorative concretes: boosting creativity

**Colors, surface finishes and shapes for both outdoor and indoor application:** With LafargeHolcim's range of decorative concretes, homebuilders, homeowners, architects, and designers can create the homes and projects they envision. Our high quality aesthetic concretes, such as Artevia®, are **easy to place, require low maintenance, and demonstrate great resistance to wear and tear**, all while being cost-effective.



### Best in-class permeable concretes with advanced drainage technology

LafargeHolcim's range of draining concretes offers sustainable solutions that combine the properties of concrete and advanced drainage technology. **They exhibit high permeability and rapidly direct storm water off streets, parking surfaces, driveways, and walkways, thus reducing the risk of flooding.** A range, including Hydromedia™, Stormpave, and Permecrete, is developed to meet the requirements of various environments, such as low-traffic pavement structures (cycle paths, parking lots, driveways, and sidewalks), sports fields, roof terraces, or sub-bases for building and infrastructure works.



### A new generation of insulating concretes for energy-efficient buildings

With its **range of structural ready-mix concrete and screeds that combine strength and thermal insulation to allow up to a 35% reduction in heat losses**, LafargeHolcim provides the market with a unique solution. The concrete's thermal conductivity is reduced by a factor of 5 (from 1.6 W/mK for conventional concrete to 0.3 or 0.6 W/mK for equivalent thermal insulating concrete).

Our construction solution mindset allows us to offer the best solutions for the owner and the developer: **LafargeHolcim insulating concretes minimize heating and air-conditioning costs and cut energy consumption in buildings**, contributing to our track record of achieving the most advanced international environmental certifications (LEED®, BREEAM® or HQE®).

Our solutions, which include Thermedia®, EcoTerm, or Thermicimo, are cost-effective, more practical, greener, safer, and healthier.



## LafargeHolcim Services for our Customers

- **Project support:** From the initial phase LafargeHolcim's world-class experts support customer projects by reviewing project requirements, identifying needs, and proposing innovative solutions.
- **Mobile plants:** For major building and infrastructure projects requiring dedicated volumes and continuous supply, we can set up mobile plants near construction sites to ensure the efficient and rapid delivery of our ready-mix concrete products.
- **Logistics and pumping:** To ensure punctual deliveries to customer job sites, LafargeHolcim manages one of the largest fleets of ready-mix concrete trucks in the market. In certain countries, we offer delivery and pumping services for both small and large construction projects.
- **Placing and finishing:** In select locations, LafargeHolcim offers the combined supply of value-added concrete solutions and approved applicator placement. For our customers, this results in simpler worksite management through a single contact responsible for materials and placing. Customers also benefit from LafargeHolcim's trusted and consistent quality.

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INDIVIDUAL HOUSE, FRANCE  
Artevia® Print

**Lafarge Iraq delivers Value Added and Developing Solutions Products (VAPs). We provide a full range of concrete products to meet our customers' needs and expectations.**

**High Performance & Innovative Products to Improve Customer Satisfaction:**

- High & Ultra Performing Concrete Products: 50 MPa and above
- Early Strength 8, 12, 24 , 48 and 72 hours: 20 MPa and above
- Screed (Aggregate  $d_{max}$  12mm): 5 MPa and above
- Micro Crete (Aggregate  $d_{max}$  5mm): Range from 15 to 40 MPa
- Low Permeability Water Tight: 25 MPa and above
- Flow Concrete: 5 MPa and above
- High Density: Range from 20 to 40 MPa
- Light Weight/Low Density
  - Non Structural: 20 MPa and below
  - Foam: 1- 4 MPa
- Shotcrete: 25-40 MPa
- Injection Grout: 15 MPa and below
- Injection Mortar: 30 MPa and below
- Lightweight, Structural and Thermal Insulation: 45 MPa and below
- Artevia® (decorative concrete)
  - \*Printed; 25-30 MPa
  - \*Exposed; 25-30 MPa
  - \*Sand; 25 MPa and below
- BC Tranche (trench & void fill)
  - \*Standard (manual excavation): 0.7 MPa and below
  - \*Fine (3mm max): Up to 3 MPa
- Stabilised Mortar
  - \*MorPlast (plastering mortar)
  - \*MorBricks (mortar for brick and blocks laying)  
Workability: 12–36 hours upon request.
- Hydromedia; 25 MPa and below
- Fibre (Steel Fibre, Polypropylene); all strengths
- Weather Mix Concrete: all strengths
- Durable Concrete: 25 MPa and above
- Delayed/Long life (Consistency > 2h)

Mpa = N/mm<sup>2</sup>  
Lafarge works also in PSI (Pound/square inch) & in Kg/cm<sup>2</sup> (equivalent to 9.8Mpa)

## Quality Testing



Concrete cubes compression testing

### The biggest concrete lab in Iraq

Established in 2013 at a size of 550 square meters, the laboratory is equipped with state-of-the-art equipment from Europe. Qualified and trained staff adhere to Iraqi and international standards while testing and analyzing samples.

## Over 40 lab tests

are used to certify raw materials and concrete in its different phases.

The lab tests cover and test the durability of different phases of concrete, from raw materials to hardened and fresh concrete.



Safety handling of cubes

## Over 40,000

cubes were tested in 2015.

On a daily basis, we measure standard deviation, coefficient of variation, one sigma and two sigma limits, and several other KPIs and measures.

**Our objective is zero failure. We are committed to quality, consistency and performance.**

### Automated production system

### No manual intervention

Our plants are equipped with the same production system found in Lafarge RMX plants worldwide.

We produce concrete in fully automated, state-of-the-art batching systems.

The quality department creates the recipes, which are produced without human intervention.

Using our in-house laboratory IT systems, all products' mix designs are managed centrally from the central laboratory and sent electronically to batching plants.



BCMIX, a full automation system

## Meeting Customer Expectations

At Lafarge, we aim to meet the increasingly complex needs of architects, engineers, contractors, designers, and builders by enabling the creation of lighter, more aesthetically-pleasing and sophisticated forms.

We are consistently working to improve the quality of our products and services, and have established a systematic approach for receiving customer feedback. We are creating solutions to ensure that all building and civil work be done with improved mechanical, functional, and aesthetic performance.

Quality raw materials are carefully selected to ensure the optimal performance of our products in your jobsites.

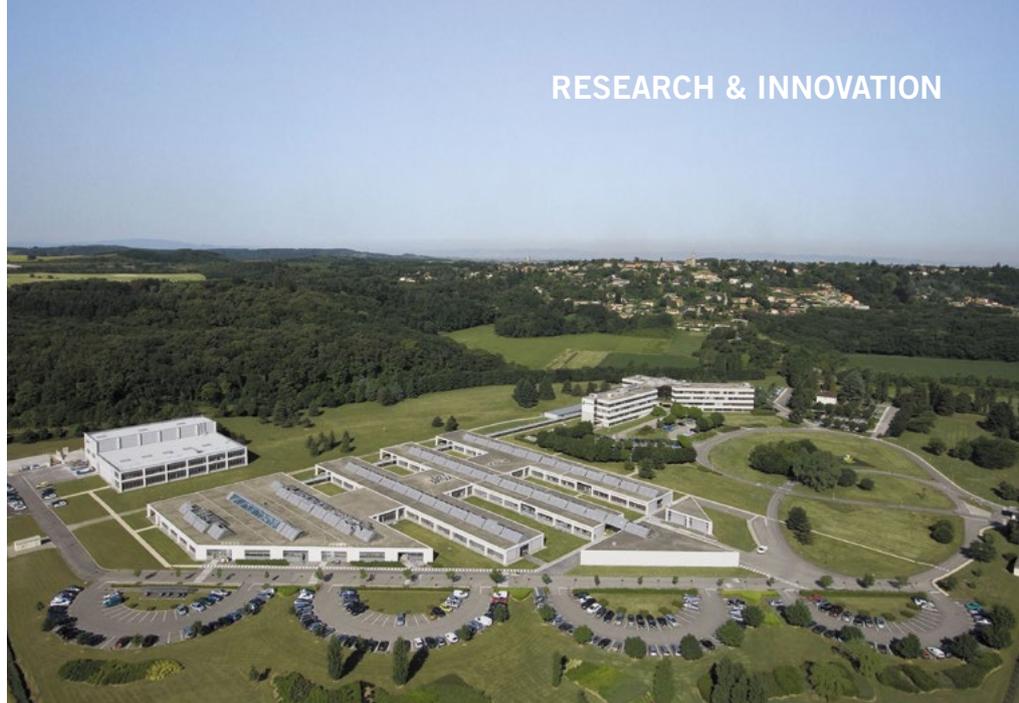


Foam Concrete - Sulaymaniyah



Testing water penetration - central lab Erbil

LafargeHolcim's Research & Development (R&D) is driven by our customers, who face today's challenges of achieving energy efficiency, lowering cost of construction, reducing their environmental footprint, and meeting high aesthetic, health, comfort, and well-being standards. Together with our customers and partners, our top in-house R&D teams develop highly innovative products, solutions, services, and advanced manufacturing processes.



LAFARGEHOLCIM RESEARCH CENTER - LYON, FRANCE

## Improving the energy efficiency of buildings

### Our challenge:

Providing builders and homeowners with highly effective insulation solutions

### LafargeHolcim R&D answers:

- Due to our unique knowledge of the thermal and mechanical properties of concrete, we have developed a new generation of insulating concretes
- We are moving forward by developing new insulating materials (protein-based or mineral foams) and building systems



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## Reducing construction costs and contributing to more affordable housing

### Our challenge:

Housing costs are critical for billions of people worldwide. We must offer affordable and cost-effective building solutions to our customers and end users

### LafargeHolcim R&D answers:

Developing sustainable and environmentally-friendly construction solutions with innovative materials and systems



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Lafarge Cameroun - Bati Services

## Minimizing our environmental footprint through process innovation

### Our challenge:

Reducing the CO<sub>2</sub> emissions resulting from cement manufacturing to minimize our impact on climate change

### LafargeHolcim R&D answers:

- Leveraging our R&D resources to continuously improve our manufacturing processes by capturing thermal energy, recycling it back into the process, and sourcing power from renewable sources
- Our expertise in cement chemistry has allowed our R&D teams to design lower-carbon cements
- Moving forward, we will partner with some of the world's most innovative and advanced start-ups, such as Solidia, with whom we are working on new cement and concrete technology that could reduce CO<sub>2</sub> emissions by up to 70%



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# REFERENCE PROJECTS

Lafarge oversees your project's development in Iraq and adapts its offer to meet your needs

1. Mobile equipment and number of plants
2. High-quality laboratory
3. Quality plan, specifications, and performance
4. Professional operation management
5. Value added products: decorative concrete for roads and gardens, mortar, foam, screed and more

We are sure that together, we can find the right solution for your project in Iraq (see contacts on last page).

Future City - Erbil



The Grand Millenium Hotel- Sulaymaniyah



Military Hospital Project - Baghdad



Erbil Media City



Khabat Power Plant - Erbil



Karbala Refinery Project Site



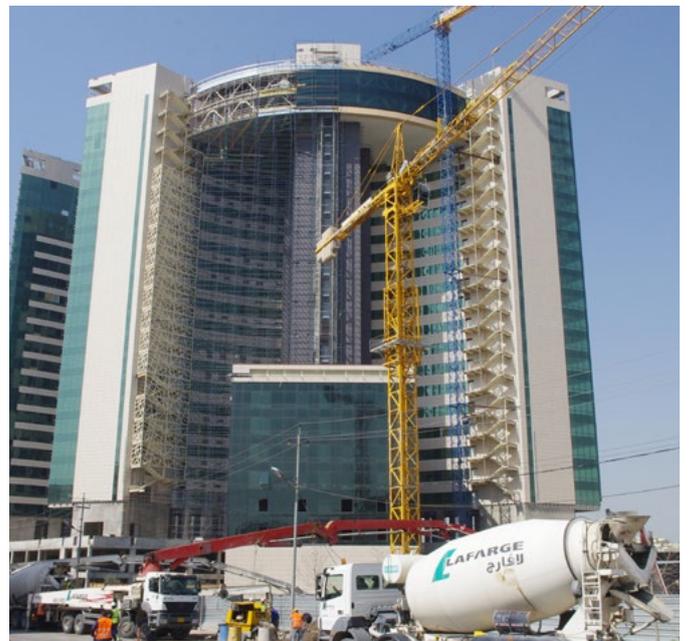
High Crest Hotel Project - Erbil



Power Plant Project - Beiji



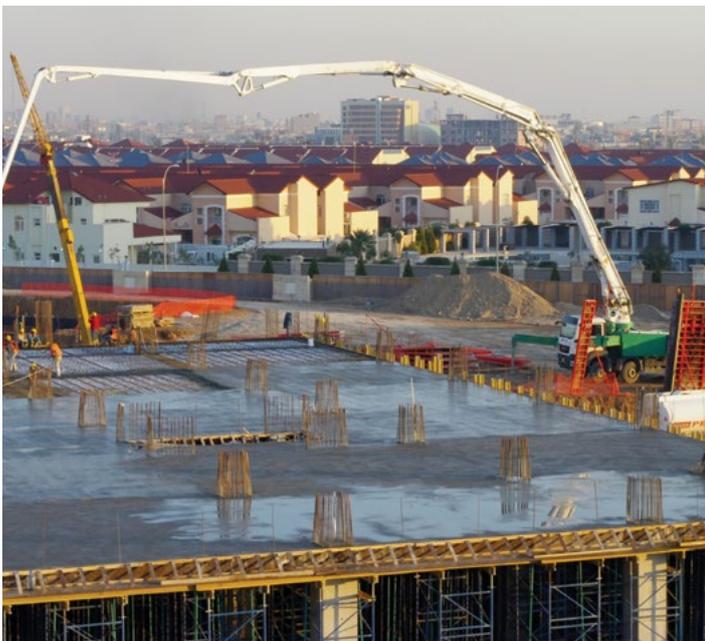
Housing Project - Erbil



Gulan Tower Project - Erbil



American University - Sulaymaniyah



Hilton Project - Erbil



Cement Plant Project - Najaf



Kobane Bridge - Sulaimani



Khoshnaw Tower - Erbil





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