



CASE STUDY

**AN EXEMPLARY MASTERPIECE OF CONSTRUCTION
& ARCHITECTURE**

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Abstract

For Muslims across the globe, Mecca is the holiest place on earth. Grand Al Haram Mosque in Mecca is one of the largest mosques in the world subjected to historically grand expansion project. The government of Saudi Arabia took an initiative to expand the Grand Mosque – Al Masjid Al Haram so as to accommodate increasing numbers of pilgrims and worshippers. The expansion project tends to add 400,000 square meters doubling the existing space, and is supposed to increase its total capacity up to 2.5 million worshippers at a time. Trust Pro Contracting was the sub-contractor appointed for fireproofing and concrete repair works. Trust Pro Contracting is a fireproofing and concrete repair specialist with a highly capable and experienced team of engineers, managers, and workers. We delivered the work as demanded by the Architecture & Building Construction Division, Saudi Binladin Group.

About The Project

Location

Mecca

Sub-contractor appointed by, Saudi Binladin Group for - a) concrete repair works and b) fireproofing

Trust pro Contracting

Grand Expansion: Historic Expansion of Grand Al-Haram Mosque in Mecca Al-Mukarama

The biggest holy mosque expansion project across KSA, Al Shamiah is recognized as one of the grandest of its kind in the world. The project design is marvelous and covers an area as huge as 750,000 square meters. It is located in a series of development projects by the government so as to develop the areas surrounding Mecca's Holy Shrine.

The Haram expansion project is proposed for the reconfiguration of the place so as to meet the particular needs of the region and visitors more appropriately than ever. The absorptive capacity of the project is about two hundred and fifty thousand people. However, the capacity of accommodating only worshippers is even more, up to four hundred thousand. The entire project houses a number of leisure areas such as restaurants, hotels, shopping malls, markets, and public services such as bus stations and car garages. Permanent housing has been recently introduced in the project, which definitely makes it an exceptional place.

This largest ever expansion of the grand mosque in history is extremely well planned to develop the sites' architectural, technical and security aspects. The entire project has been divided into three sections, out of which the first one is aimed to expand the Haram to accommodate two million worshippers at one time.

Al Masjid Al Haram, Mecca





Overall Objectives of the Project

- To develop such a physical environment that perfectly matches the place of the Holy Mosque in Mecca Sharif.
- To integrate the project with the structural plan for the development of the central region of Mecca.
- To expand the Haram al-Sharif yards to accommodate the largest possible number of worshipers.
- To allow safe and rapid exit of the crowd of pilgrims from the northern side of campus.
- To alleviate the pressure of urban development in the area directly on the borders of the Haram al-Sharif.

Al Shamiah (Haram) Expansion

Zone 1: Covers Sha'ab Amer between the second ring road bridge leading to the tunnels and Ree' Atla' to the second ring road.

Zone 2: Includes Al-Falq and Mount Abadi and is located between Abdullah Bin Al-Zubair Street to the east and Khaled Bin Al-Waleed Street to the west and the holy mosque's northern courtyards to the south.

Zone 3: Includes Mount Al-Madafe', the area located on the mountain peak and the surrounding areas.

Zone 4: Includes the Jarwal area along Jabal Al-Ka'bah Street toward the city's maternity hospital.

Zone 5: Includes Jabal Al-Ka'aba, the area located between the extension of Jabal Al-Ka'aba Street in the west to Harat Al-Sadah neighborhood toward Qubbat Mahmood (Mahmood Dome) and Al-Tayseer Square.

Zone 6: Includes Jabal Al-Qal'ah, Jabal Ajyad and the area behind King Abdulaziz Endowment from Ajyad Street in the east to Ibrahim Al-Khaleel Street in the west.

These areas, originally constructed without any planning, have been under expansion to sufficiently accommodate Haj and Umrah pilgrims.



A) Concrete Repair Works – Column, Beams & Slab

Material Used

- Nitoprime Sinch Zinchrich
- Nitobonde EP
- Rendroc SP Xtra/Rendroc HS Xtra
- Rendroc LA 80
- Micro grout

Equipment Used

- Hilti breaker machine
- Injection machines

Method 1: Concrete repair work using patching system

- Application of an anti-corrosion material - Nitoprime Nitoprime Sinch Zinchrich.
- Application of bonding agent layer - Nitobonde EP.
- Erect wooden formwork to receive micro concrete.
- Application of non-shrink repair grouting material - Rendroc SP Xtra/Rendroc HS Xtra from Fosroc.

Method 2: Concrete repair work using form and pumping status technique

- Application of an anti-corrosion material - Nitoprime Nitoprime Sinch Zinchrich
- Application of bonding agent layer - Nitobonde EP
- Erect watertight wooden formwork with inlet valve and air release vavle to receive the under pressure micro concrete .
- Application of non-shrink repair grouting material - Rendroc SP Xtra/Rendroc HS Xtra from Fosroc.

Execution of the Project

Strictly in compliance with the Security and Safety Insulation Plan provided by the contractor, our team of skilled workmen accomplished the desired concrete repair work within the given timeline. Commercial concrete repair works are stringent and demand skilled resources to cover each smallest area in detail in order to deliver effective and lasting results. Concrete repair work was carried out using the Patching system and pumping status technique. Despite having to carry out the entire repair work in two stages considering the complete safety, especially of falling debris, our team was able to complete the project within the stipulated time frame, to the complete satisfaction of the customer.



B) Fireproofing for Steel structure

Material Used

- Steel guard FM 564
- Amercoat 450 H

The Project Requirement

- Supply and application of steel guard FM 564 intumescent fireproofing coating system using spray pump technique (at consultant approval thickness)
- Supply and application of Amercoat 450H (at 75 micron)
- Overall touch-up work

Execution of the Project

In fireproofing and fire protection, Trust Pro Contracting has been a leading name over the years. Our expertise, specialized workmanship and unmatched experience got a part of this huge project work to us. Fireproofing is a challenging task in itself because of the most important factor associated with it – human safety. We specialize in providing custom fireproofing solutions to large project sites. We provided the appropriate solution to the requirement of fireproofing for an extensive area of Al Harammosque. As far as the paintwork is concerned, our team accomplished the coating and paintwork delivering the desired adherence, water resistance, acid & mineral oil resistance, and lasting luster. The overall effect imparted the area a superior aesthetic touch.

Challenges Encountered during the Execution of the Project

- The expected level of accuracy was the biggest challenge
- We had to meet a strict time frame with a restricted workforce of 100
- The path of project management that we followed was extremely critical
- The project demanded a restricted number of skilled workers, specialist engineers and management personnel
- Meticulous coordination was required to work in harmony with other allied activities on the site

We are proud to be chosen for a part of the Al-Shamiah mega project, which speaks for the strength, workmanship and quality of our work.



To know how we can help you with passive fire protection solution, feel free to get in touch with us!

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