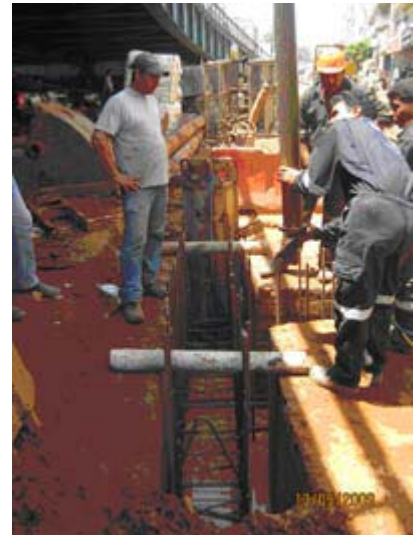


Barbir Tunnel Project

In the framework of the development implementation of infrastructure works for the city of Beirut – work on the second set of the Barbir Bridge Project has started.

Project location:

The project starts from the west facing Talmes street quarter and ends in the east before Fouad 1st bridge (Bshara Al-Khoury Avenue). The covered part of the tunnel is located opposite Al-Ouzai street which leads to Al-Bastah quarter from one side and Al-Tareek El Jdideh quarter from the other side. It also faces Mohamed Ali Beyhum street leading to Al-Makased hospital.



Project Description:

The project includes: First, the abolition of the current Barbir bridge, an iron bridge which was previously implemented for an interim period and now suffers from many impurities in the pillars and supports and could no longer be maintained. Second, the implementation of a tunnel as a substitute to the bridge to be abolished. Third, rehabilitation of infrastructure and all intersections leading to the work area, and finally, alteration and rehabilitation of all services facilities belonging to this work, in addition to securing side roads to serve the traffic on the surface of the ground, along the tunnel and above it, and the implementation of a lighting network around it.

Description of the Tunnel:

The total length of the tunnel that is going to be implemented is 236 m, of which 62 m is going to be a ceiled section in the middle of the tunnel and an open section of 78m to the west and 95m to the east. The width of the tunnel to be 15 meters, which includes two courses each with a width of 7.20m separated in the middle by a concrete barrier and surrounded by a narrow sidewalk for emergency situations. The tunnel works also to include lighting conforming to standards and coating of walls as well as the draining of rainwater through an electro-mechanical pump. As the nature of the earth contains a high quantity of groundwater, thus requires the adoption of a special method to prevent collapses that may take place during the implementation, as well as protecting the tunnel once and for all from the leaking of water.

Method of Implementation:

Although this tunnel will be executed with reinforced concrete but according to a modern way which is only adopted in large cities that are congested with cars and buildings where it is not possible to dig deep because of the damages that will result from implementing such constructions (cracks in buildings or cave-in soil) noting that the method of implementation depends at the start on drilling to cast the concrete walls on all sides of the tunnel (maximum depth of about 14 meters) without digging for the tunnel itself or the abolition of the bridge, and, consequently, stopping the traffic completely to the project. And later on concrete will be poured to form reinforced slabs which will connect walls which were implemented on both sides, and finally the current iron bridge will be dismantled, and drilling will then start on the tunnel itself.

Alteration of services:

The most important services to be modified first, is the common drainage system for rain water and sewage, where it will be altered from Al-Ouzai Street (Al-Bastah) to Omar Beyhum Avenue (opposite El-Baba excellent sweets) by a new line designed only for sewage with a diameter of 1200 mm and a length of about 1000 meters. Also the course of the high tension power line will be altered as technically it conflicts with the establishment of the tunnel. As for the rest of the services new lines will be established for the rainwater, drinking water, telephone and electricity (medium tension) lines.

Project Duration:

The time required for the completion of the tunnel is 16 months, taking into consideration all the above-mentioned work, including alteration of the line services, electricity (high tension power lines) and civil works along the tunnel and above it. However, it should be noted that the dismembering and abolition of the current bridge will be done only after a minimum period of time of about 6 months pending the alteration of the services and the completion of the erection of walls and the pouring of part of the concrete slabs according to the following:

- Erection of left and right walls of the tunnel 6 months
- Pouring of concrete slabs 3 months
- Digging the tunnel 3 months
- Rehabilitation of infrastructure and completion of services line 4 months

Comparing the pros and cons of the traditional method with the method adopted:

Traditional way

1. Stop traffic completely from the project area during the whole period of the implementation of work and this was mainly observed as basic.
2. Need more time for implementation due to the presence of groundwater, noting that this period could exceed the period of work done in the Adlieh and Mathaf projects in case it was adopted.
3. The possibility of cave-in the neighboring buildings during implementation.
4. Weak protection of the tunnel from underground water leakage.

Modern way

As for the adopted modern way, it can overcome the negative aspects mentioned above in that there is no need to stop traffic completely, except in stages, as shown in the maps, as well as the abolition of the bridge to be undertaken after a while and securing better protection for the tunnel from groundwater and protecting the neighboring buildings during the implementation of the work; however, this adopted method requires additional costs in view of the modern equipment used and the speed required for implementation.

