

## **Ground and structures studies**

More than 350 studies of ground and structures were carried out in various sites in Lebanon, and abroad including/understanding tests of laboratory, calculations of stabilities, and indications for the repair and building work possibly. Among most important we quote:

- 1 - Study of stabilization and rehabilitation of the buildings of the official school of Bednaye - caza of Zahlé, November 1986.
- 2 - Study of the ground of the foundations of the Church Elie Saint in Mkalles, July 1987.
- 3 - Study of the foundation soil of the Church George Saint in Terbol in the Al-bayader el zone janoubiat, September 1987.
- 4 - Study of the foundation soil of the City St Vincent of Paul with Chahtoul, July 1988.
- 5 - Study of the foundation soil of the convent ND. of deliverance, piece N° 2714 in Jbeil, Nov. 1989.
- 6 - Study of the foundation soil of the complex SlafCenter, piece N° 1927 in Dekwané, October 1991.
- 7 - Study of the foundation soil of the residential complex GhabetAssounaoubar, piece N° 723 in Maska el Ghabé, March 1992.
- 8 - Study of the foundation soil of the liquid air factory with Dekwané piece N° 73 on behalf of company E.G.L March 1992.
- 9 - Study of the foundation soil of the industrial complexes of Mkalles established on the pieces N° 655 and 656, April 1992.
- 10 - Study of the foundation soil of the hospital of peace with BassatinTrablos, piece N° 3673, May 1992.
- 11 - Study of the foundation soil and the structure of the residential complex Assawan located on the piece N° 3691 in BeitChébab, June 1992.

- 12 - Study of the foundation soil and the structure of the balneal complex Aqualand for the account of the Company of the Tourist Investments with Batroun, piece N°1763, October 1992.
- 13 - Study of the foundation soil of the series of residential complexes Al Rayan (Rayan 1, 2, 3, 4 and 5) located at Fanar on pieces N° 2804, 125, 626, 81 and 114, December 1992.
- 14 - Study of the foundation soil of the series of the residential complexes Mar Roukoz located at Mar Roukoz on pieces N° 495,496,497 and 498, March 1993.
- 15 - Study of the foundation soil of the residential complex RamiCenter in Mezher pieces N° 95, April 1993.
- 16 - Study of the foundation soil of the residential complex Blue Horizon in AinSaadé piece N° 1810, June 1993.
- 17 - Study of the foundation soil of the Roufaël center in Médawar piece N° 60, September 1993.
- 18 - Study of the foundation soil of the buildings of the Bookshop of Lebanon with ZoukMosbeh, Sept. 1994.
- 19 - Study of the foundation soil and the structure of the tower G. RIZK with Baouchrié portions out N° 3389, September 1993.
- 20 - Study of the foundation soil of the banking complex Byblos Bank in Kousba piece N° 2335, October 1993.
- 21 - Study of the collapse of two buildings of the residential complex Montana with Byacoute. Study ordered by the general prosecutor of the area of the Lebanon mount. February 2000.
- 22 – Report on structural investigation and structural assessment survey carried out for the convent Notre Dame building in Hadath in view of an additional floor. June 2000.
- 23 - Study of the collapse of buildings of the residential complex Mezher with Naameh. Study ordered by the general prosecutor of the area of the Lebanon mount. March 2001.
- 24 – Report on structural investigation and structural assessment survey carried out for the BeirutBaptistSchool building in Mousseitbé in view of an additional floor. August 2001.
- 25 - Study of problems of stability and structure appeared to the villa Kamel el Assad in Nabatieh, BF 9 with presentation of solutions. Study carried out on ordering of the Court of Appeal of Beirut. September 2003.

26 - Study of the foundations of the residential complex Abella with Bsafrine-Zahrié, BF 139. May 2004.

27 - Study of collapse to Fanar with the BF 738, and the incidences of this accident on stability nearby buildings, in particular on the villa yazbeck located on the BF 748 neighbor. Ordered study by the Court of Appeal of Matn. April 2004.

28 - Study of reinforcement of the ground of pieces N° 738 and 748 in Fanar following crumbling. Study carried out at the request of Misters Michel Cortbawi and Hanna Tawk, owners of the BF 738 in Fanar. May 2004.

29 - Study of stability of the system of foundations of the buildings of Waqf Mar Challita in Faraya BF 442. Description of the problem and presentation of the solutions. Study carried out at the request of committee of Waqf Mar Challita. January 2005.

30 - Study of the structure and the foundations, critical study of the experts reports and presentation of means of repair for the Eid Villa located at Lans-in-Vercors in the area of Grenoble, France. Study carried out at the request of the owner of the villa, Mr. George Eid. January 2005.

31 - Studies of the effects on constructions and the ground of the explosion which has occurred on February 14, 2005 in the area of the Hotel St George and which caused the death of President Rafic Hariri and of its companions. Study ordered by the legal general prosecutor and whose principal objective was to determine if the explosive load were placed at the top or the lower part of the ground. March 2005.

32 - Study of structure of the AltaVista tower in Kaslik, following the explosion which has occurred on March 23, 2005 and which deeply touched the structure of the tower, and presentation of the solutions for repair. Study carried out at the request of the municipality of Jounieh. April-May 2005.

33 - Study of the incidences of the explosion which took place on March 29, 2005 in the area of Baouchrieh and who touched the buildings located on the BF: 230, 3230 and 3231, and presentation of the means of repair. Study carried out at the request of the military examining magistrate. April 2005.

34 - Study of problems of structure appeared in the buildings of the factory Najjar Coffee in Fanar, BF 1254. December 2005.



35 - Study of problems of stability and structure appeared at the residential village of DeirTamiche, BF 140 with presentation of solutions. Study carried out on ordering of the court of the summary procedures in Metn. January 2006.

36 - Study of problem of slip of ground to the BF 120 in Mteileb and having touched the building Abboud located above. January 2006.

37 - Study of the collapse of a cliff face located on the BF 426 at Bsalim, causing a fatal accident. Presentation of stabilization processes. Study carried out on behalf of the municipality of Bsalim. February 2006.

38 - Study of the system of reinforcement of the foundations of the factory Najjar Coffee in Baouchrieh, BF 993. February 2006.

39 - Study of the slip of ground which has occurred in the zone of Fawar within Antélias. Determination of the causes and presentation of the solutions. Study carried out on behalf of the municipality of Antélias. April 2006.

40 - Study of the foundations of the urban complex Mortada with Mousseitbé, BF 4897. June 2006.