



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

World Heritage

31 COM

Distribution Limited

WHC-07/31.COM/INF.7A.1

Paris, 4 June 2007

Original: English/French

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

World Heritage Committee
Thirty-first session
Christchurch, New Zealand
23 June – 2 July 2007

**Item 7A of the Provisional Agenda: State of conservation of the properties
inscribed on the List of World Heritage in Danger**

**INF.7A.1 Synthesis of the Action Plan for the safeguarding of the cultural
heritage of the Old City of Jerusalem**

SUMMARY

This document presents the synthesis of the activities undertaken by the World Heritage Centre for the preparation of the Action Plan for the safeguarding of the cultural heritage of the Old City of Jerusalem in pursuance of 32 C/Resolution 39 of the General Conference and 171 EX/Decision 18 of the Executive Board of UNESCO.

**SYNTHESIS OF THE ACTION PLAN
FOR THE SAFEGUARDING OF THE CULTURAL HERITAGE
OF THE OLD CITY OF JERUSALEM**



INTRODUCTION

BACKGROUND

- I Preliminary mission of experts (February-March 2004)
- II International Committee of Experts
- III Implementation steps
- IV Components of the Action Plan

1. Setting up of an information database

- 1.1 Inventory and Conservation Priorities Map for Historic Monuments and Sites

2. Identification of conservation and rehabilitation projects of individual monuments

- 2.1 Criteria for selecting projects
- 2.2 Project Profiles

3. Action to support the conservation of residential and commercial buildings

- 3.1 Manual for housing maintenance and rehabilitation
- 3.2 Training of technical personnel and awareness raising activities for the inhabitants
- 3.3 Study for a microcredit scheme

4. Initiatives to support cultural activities

5. Funding mechanisms

ANNEXES

- Annex 1 Members of the International Committee of Experts
- Annex 2 Sample of Project profile
- Annex 3 Samples of Manual cards

INTRODUCTION

The unique character of Jerusalem and its cultural heritage, combining in an outstanding manner historic, artistic and spiritual values, has always drawn the world's attention. Its inscription, further to a nomination by Jordan, on the World Heritage List, in 1981, and on the List of World Heritage in Danger in 1982, was a recognition of the cultural value of its urban fabric and monuments, of its extraordinary spiritual significance and of its unique social composition, the result of many centuries of history and cultural development.

Sensitive to the universal nature of Jerusalem, the international community has often made appeal to UNESCO in an attempt to promote dialogue and cooperation in what appeared to be a less controversial issue: the safeguarding of the cultural heritage of the Old City. Addressed at each session of UNESCO's governing bodies since 1967, this issue has been, and continues to be, a challenging test to the relevance of the Organization, whose mandate includes "*assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history...*".

Despite all the efforts undertaken throughout the years, the state of conservation of the Old City is still far from satisfactory. The lack of a politically conducive framework has so far hampered the implementation of a decisive, comprehensive action in favour of the cultural heritage of Jerusalem. For this reason, in 2001, the Director-General of UNESCO reiterated his intention to launch an international initiative for the safeguarding of the Old City. This was made possible in 2003, when the General Conference of UNESCO adopted, unanimously, a Resolution calling for the preparation of an Action Plan to safeguard the cultural heritage of the Old City of Jerusalem, thus giving UNESCO a clear mandate to develop an Action Plan, for the conservation of the whole historic city, in a spirit of full cooperation with the concerned parties.

The various steps taken since then are presented hereafter, in particular the establishment of the International Committee of Experts for the Safeguarding of the Cultural Heritage of the Old City of Jerusalem and the elaboration of the Action Plan requested by the Executive Board and General Conference of UNESCO.

While noting the progress that has been achieved in many areas, this initiative should be developed in such a way that the City's inhabitants would benefit as much as its monuments, since the improvement of daily life and of the urban and social environment is vital in preserving the universal value to which the Old City of Jerusalem owes its inclusion in the World Heritage List.

In addition, it is crucial to undertake, as soon as possible, effective implementation of the second phase of the Action Plan. We cannot content ourselves with studies, however comprehensive and valuable they may be. Concrete action is expected to be taken in the field, showing that change is possible, and that enhancement of the urban fabric and heritage is not a fanciful hope.

UNESCO expresses its gratitude to the Italian Government, whose generous contribution has allowed this work to start and be implemented. For this work, the Organisation also wishes to extend its thanks to all the international, Israeli and Palestinian experts who spared no efforts in this joint endeavour.

Finally, the World Heritage Centre wishes to dedicate this work to the memory of Gilles Nourissier, Director of the Ecole d'Avignon, who made a major contribution to this effort.



A late 16th century map

BACKGROUND

At its 32nd session in 2003, the General Conference of UNESCO fully supported the initiative to prepare a comprehensive plan of action to safeguard the cultural heritage of the Old City of Jerusalem. To this end it asked UNESCO to dispatch, in cooperation with the concerned parties, a high level mission to Jerusalem, with the task of assessing its state of conservation, and to set up an equitably composed committee of experts to be entrusted with proposing, on an exclusively scientific and technical basis, guidelines for this Plan of Action and proposals for its implementation.

I. Preliminary mission of experts (February-March 2004)

A highly qualified and purely technical mission to Jerusalem was undertaken in February-March 2004. The mission conducted a neutral, professional evaluation of the conditions of the cultural heritage within the Old City.

The report of the UNESCO mission identifies the main issues affecting the conservation of the Old City of Jerusalem:

- Natural risk factors,
- Planning, governance and management processes,
- Impact of archaeological research,
- Conservation of archaeological heritage,
- Deterioration of monuments,
- Alteration of the built fabric, urban environment and visual integrity,
- Traffic, access and circulation,
- Tourism management.

The report, presented to the Executive Board at its 170th session (doc.170 EX/10 Rev.) and to the General Conference at its 33^d session (doc. 33 C/13), constitutes the basis for the subsequent work of the World Heritage Centre.

II. International Committee of Experts

Following the request of the General Conference, an International Committee of independent experts was established and entrusted with proposing the guidelines of the programmed plan of action and to do so in consultation with the parties concerned. The International Committee is made up of twelve renowned architects, archeologists, restorers, architectural historians and structural engineers with professional knowledge of the Old City of Jerusalem (see Annex 1).

The first meeting of this Committee took place on 25 and 26 January 2005. Three major fields of intervention were identified as feasible within the existing conditions:

- Conservation and restoration of monuments, houses and infrastructure (urgent consolidation and repairs, rehabilitation of selected buildings and urban features, improvement of housing, etc);
- Capacity-building (training of professionals and craftsmen, development of training tools such as technical handbooks or manuals);

- Awareness raising (programmes for youth, community participation), academic networking (joint studies and research, gathering of documentation, establishment of a data bank) and presentation to the public (information brochures, signage).

The guidelines proposed by the Committee provided UNESCO with a framework for initiating the elaboration of the Action Plan.

III. Implementation steps

Thanks to a generous financial contribution from the Government of Italy, the Secretariat started elaborating the requested Action Plan. Once an activity plan has been drafted and its feasibility assessed, the World Heritage Centre identified a series of experts in the various fields of competence needed. The following missions were carried out:

September 2005

- Define and discuss the broad lines of the Action Plan, according to the Guidelines set up by the International Committee of Experts and in close consultation with all parties concerned;
- Identify priority actions for future project formulation and proposals for development;
- Draft a work plan for the coming 12 months.

December 2005

- Define the methodology to implement the identified activities in consultation with the local technical experts designated by the concerned parties.

March 2006

- Launch the project of Inventory and Priorities Map for the Conservation of Monuments and Historic Sites.
- Start the preparation of the Manual for Housing Maintenance and Rehabilitation.
- Develop Micro-credit schemes for housing rehabilitation.

June 2006

- Carry out the survey of the identified monuments and sites on the basis on the defined information platform, verifying on the ground the existing cartography.
- Collect the available documents,
- Enter the data in a Geographical Information System,
- Identify the needs and determine the feasibility for cultural activities.

November 2006

- Carry out the detailed survey of the priority sites.
- Identify the needs and determine the feasibility for training programmes.
- Discuss the draft Manual for Housing Maintenance and Rehabilitation with local experts.
- Identify possible awareness-raising programmes and cultural activities to be addressed to youth on the conservation of the heritage of the Old City.

With the agreement of the concerned parties, a proposal for Phase 1 of the Action Plan was prepared and approved in October 2005. Following the guidelines defined by the International Committee of Experts and taking into account the current situation, Phase 1 has been focused on those activities which could be realistically envisageable in the present context. A revision of the planned activities was made further to the consultants' advice and discussions with the concerned parties during the implementing phase.

The results of the first activities were submitted to the second Meeting of the Experts' Committee, which was held in Paris on 4 and 5 September 2006, also attended by two of the consultants contributing to the preparation of the Action Plan. The Committee expressed its appreciation of the work carried out and issued its synthesis of proposals and remarks to improve the existing work, as well as several additional inputs to complete the draft Action Plan and to move forward into the second phase.

Phase 2 has already begun with the launch of some activities identified during the implementation of Phase 1 and for which the funds were available. In particular, the development of the first training and cultural activities, and the completion of the feasibility study for microcredit schemes.

IV. Components of the Action Plan

Taking into account the specific conditions prevailing in the Old City of Jerusalem, it was agreed to follow a realistic approach and, therefore, the Action Plan consists of five main pillars:

1. Setting up of an information database;
2. Identification of conservation and rehabilitation projects of individual monuments;
3. Action to support the conservation of residential and commercial buildings:
 - a) Rehabilitation Manuals,
 - b) Training of technical personnel and awareness raising activities for the inhabitants,
 - c) Study for a microcredit scheme;
4. Initiatives to support cultural activities;
5. Funding mechanisms.

In the framework of these identified mainstays, several activities have already been carried out by the World Heritage Centre as Phase 1 (see the table below). Some others, on-going or to be developed in the near future, are presented as Phase 2.

Overview of the Action Plan for the safeguarding of the cultural heritage of the Old City of Jerusalem

Fields of intervention	P h a s e 1	P h a s e 2	
	<i>December 2005 / February 2007</i>	<i>Short term (March 2007/ February 2008)</i>	<i>Medium term (2008-2010)</i>
1. Information database	Inventory and Priority Map	---	Additional studies and updating
2. Conservation projects	19 Project Profiles	---	Restoration Pilot Projects
3. Residential and commercial buildings:			
a) Rehabilitation Manuals	Preparation of Manual for housing maintenance and rehabilitation	Publication of the Manual	Preparation of other specific tools
b) Training activities	Needs Assessment	- Apprenticeship Programme - Awareness programme for inhabitants	- Training for local craftsmen - On-the-job training projects - Creation of academic programmes.
c) Microcredit scheme	Demand Assessment and programme design	- Offer Assessment - Legal framework analysis	Microcredit system
4. Cultural activities	Needs Assessment	Implementation of two UNESCO projects (DREAM centres, Digiarts project)	- Extend the activities - Improve the spaces
5. Funding mechanisms		Booklet Publication	International mobilization

1. SETTING UP OF AN INFORMATION DATABASE

A unified database of all heritage resources in Jerusalem, based on existing inventories and documentation and continuously updated through the necessary surveys, is needed to support long-term conservation efforts, in order to:

- Identify and map risks and threats that affect or could affect the heritage values of the Old City of Jerusalem;
- identify and fill up the gaps that may exist in the available information;
- establish long term conservation strategies based on a comprehensive view.

The setting up of the unified database should be based on the continuation of the work initiated in Phase 1 for the preparation of the Priorities Map (see below). This constituted only the first step of a long term documentation activity whose needs are bound to evolve when additional studies and more detailed surveys are taken in consideration.

Many efforts have already been made in this direction by different academic researchers and institutions. The more recent works, which have been used as basis for the database of the Priorities Map, are:

- the database prepared by the Welfare Association in the framework of the Old City of Jerusalem Revitalization Plan, based on a field survey carried out in 1998-2000, which covered the whole historic fabric, with the exception of the Jewish quarter;
- the "Old City Sites 2004" established by the Israel Antiquities Authority, in the framework of the proposal for a detailed Master Plan of the Old City to be integrated in the Outline Plan 2005 of the Jerusalem Municipality;
- the maps of Bieberstein and Bloedhorn (*Tübinger Atlas des Vorderen Orients*, Wiesbaden, 1992) concerning the period 1099 – 1750, that offers the most detailed reconstruction of the historic development of the Old City.

1.1 Inventory and Conservation Priorities Map for Historic Monuments and Sites

This project mainly focused on the preparation of a new Geographic Information System database on the historic monuments and sites of the Old City, meant to represent a tool for:

- ◆ their identification and inventory;
- ◆ the definition of the needs for conservation interventions;
- ◆ the selection of priority projects.

The aim of this database and map was not to create an additional information source, but to gather information existing in previous maps and inventories, to serve as a basis for the specific purpose of the Action Plan.

The identification of the Inventory's "objects" does not proceed from an abstract definition of what is considered as "historic monument" or "historic site".

Rather, it should be remembered that, for this purpose:

- The Old City urban fabric is a "monument" and an "historic site" in itself, as stated by the criteria for its inscription on the World Heritage List, whatever definition of these terms might be used;

• The Action Plan addresses the conservation issues of this fabric in another project concerning the historic housing, that is the minor or “vernacular” residential pattern. For the purpose of the Inventory we consider as “monuments” and “historic sites” all those elements which not only have a specific and distinct cultural and architectural character on their own, but also bring a relevant contribution to the shape and the structure of the urban fabric such as:

- Testimony of the different historic layers and the different phases in the development of the urban fabric until recent times;
- Functional and/or morphological “focal” points or “nodes” at the different levels, from the neighbourhood scale to the quarter and the city itself;
- Architectural structures or urban spaces, which have distinctiveness and/or represent a landmark in the urban context.



Details of the *Tübinger Atlas des Vorderen Orients* map concerning the period 1099 – 1750, *Wilson's Ordnance Survey map* (edition 1874) and the *Plan der Strassen & Plätze* of C. Sandreczki (1883).

The activity followed these steps:

- a) The definition of the methodology, based on the guidelines established by the International Committee of Experts.
- b) The preparatory work and the establishment of the list and database of historic monuments and sites of the Old City, based on the integration and comparison of the available sources and on the field survey. This work included:
 - The analysis of the different sources;
 - The elaboration of a working list of historic monuments and sites;
 - The preparation of an updated base map of the Old City;
 - The definition of the information platform needed in order to characterise the historic monuments and historic sites;
 - The preparation and implementation of the field survey, aimed at a final identification of the monuments and sites and to their characterisation;
 - The final identification of historic monuments and sites of the Old City (list and map), and the establishment of the GIS for the Old City, based on the findings and the data collected through the field survey.

c) The characterization of the historic monuments and sites from the outcomes of several queries to the GIS database:

- The categorisation of the different “objects” inventoried and surveyed, according to their physical and cultural relevance (complexes, buildings or parts of buildings, special features, archaeological remains, streets, open spaces);
- Their characterisation according to historic period, typology, cultural and architectural interest, functions and uses, visibility and relations to the urban context.

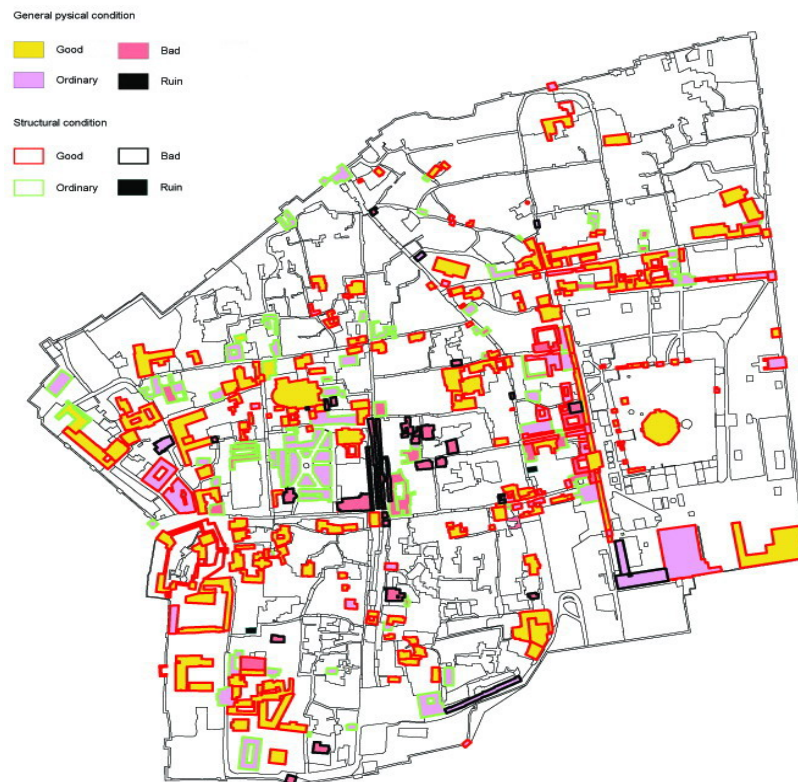
The synthesis of the physical aspects taken in consideration in this step has permitted a preliminary classification of all the inventoried and surveyed objects.

d) The elaboration of the map on the state of conservation and the identification of the historic monuments and sites that need conservation interventions, at different degrees. These needs are also defined and prioritised through specific GIS queries, meant to put in evidence:

- The threats to architectural integrity and authenticity;
- The risks of structural failure;
- The presence of incompatible uses or abandonment;
- The presence of other risks/opportunities in the surrounding urban environment.

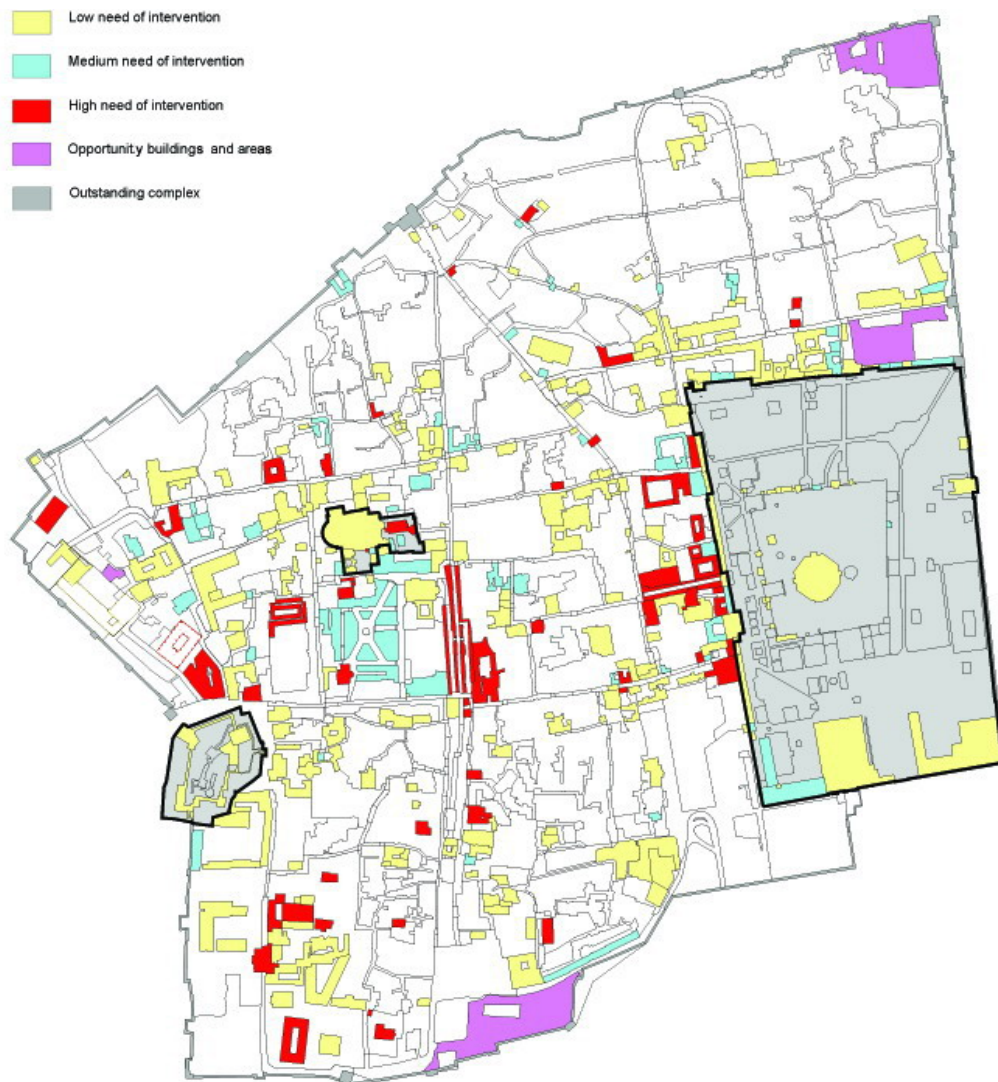
On this basis, a classification of all the inventoried “objects” is proposed that grade the “needs” of conservation interventions on buildings, as well as the needs and the opportunities for other interventions on open spaces, streets and archaeological sites. A series of monuments and sites are identified, which belong to different categories and could be the priorities of a conservation policy, meant to be a tool for both the safeguarding and the revitalisation of the Old City.

GIS Map “General physical condition”



- e) The proposal of a first selection of monuments and sites which could be addressed by pilot conservation projects in the framework of the Action Plan. This refers not only to the needs and priorities identified in the sections above, but also to the more general objective of outlining an urban conservation strategy. General criteria and specific feasibility conditions have led to identify about forty possible projects, addressing different categories and types of “objects”. Among these, 19 project profiles have been developed (see below).

Overall “priority level” and opportunities for conservation interventions



The concept of priority in the context of the Old City of Jerusalem is very delicate, taking into account at the same time the state of conservation of different elements of its heritage, their dimension, the level of risk, the real feasibility of restoration projects, and the actors involved.

The data-base will continue to be developed and enriched with information regarding the cultural heritage of the Old City and its state of conservation. This will strengthen the value of this essential management tool in view of its future use for the conservation of the Old City of Jerusalem.

2. IDENTIFICATION OF CONSERVATION AND REHABILITATION PROJECTS OF INDIVIDUAL MONUMENTS

The need to identify and implement short term actions / projects was emphasized by the experts in order to highlight the international commitment in preserving this unique heritage and UNESCO's role, avoiding over ambitious projects which would have little chance to be implemented in the current conditions.

According to the Action Plan approach, the projects should be selected not only to develop the methodological and operational basis for ensuring the safeguard of the historic heritage, but also to highlight the opportunities that may exist to undertake a broader process of rehabilitation and revitalisation of the Old City. These should therefore address buildings and sites, which present a high "need" for conservation interventions and could at the same time become the catalyst for a process to be gradually expanded in the urban fabric, particularly in the most dilapidated areas. For this, it is essential to identify and select multipurpose intervention projects, aimed at progressively improving the liveability of the Old City for its resident population, enhancing cultural and social activities, creating new income opportunities through strengthening the activities pattern, whilst ensuring the preservation and conservation of the different heritage features.

It has to be stressed that, to ensure the necessary requisite of feasibility, it was decided at the beginning not to include interventions on the City walls and the major monumental complexes (i.e. the Citadel, the Haram-es-Sharif, the Western Wall, the Holy Sepulchre) amongst the possible priority projects. These complexes are obviously considered to be the main cultural heritage assets of the Old City and represent the major poles of its functional system. These sites, critically threatened, would require maintenance and restoration interventions, but in Phase 1 the Action Plan was oriented towards feasible interventions, and conservation intervention on these monuments could not be successfully addressed in the present situation.

2.1 Criteria for selecting projects

The following criteria have been identified and used for the selection of priority conservation projects:

General criteria:

- a) Represent a sample of different historic and cultural layers;
- b) Represent a sample of the different categories and typologies of monuments and sites, with high level of architectural and/or spatial interest;
- c) Respond to specific conservation needs mainly with reference to (i) threats to architectural integrity and (ii) structural risks;
- d) Facilitate awareness raising, community participation and capacity building;
- e) Be diffused and connected to (or representing) strategic nodes or trails in the urban fabric, so that conservation projects on buildings could act as catalysts for a wider rehabilitation of the Old City.

Feasibility criteria:

- f) To respond immediately to social pressures promoting economic and cultural revitalization as an integral part of a sustainable conservation process;

- g) To give priority to interventions of reuse on empty buildings and dilapidated or under-utilised open spaces, in connection with criterion f) but also to improve access and visibility of monuments and historic sites;
- h) To give priority to the rehabilitation and repaving of the major streets, particularly the stepped ones, in order to improve accessibility for disabled people, garbage collection, and the overall environmental conditions.
- j) To give priority to the rehabilitation and restoration of the special features connected to the main streets pattern, in order to ensure their preservation and increase their visibility, involving the inhabitants in the rehabilitation projects.

2.2 **Project Profiles**

On the basis of the “Priorities Map” results, the recommendations of the International Experts Committee, the feasibility-oriented set of criteria proposed and after the reactions of the concerned parties, the Project profiles have been developed following these categories:

- a) Conservation/Restoration projects,
- b) Adaptive reuse projects,
- c) Conservation and rehabilitation of used buildings in bad repair,
- d) Public open spaces upgrading,
- e) Street project.

a) **CONSERVATION/RESTORATION PROJECTS**

- 1. Cathedral of St. James
- 2. Church of St. John the Baptist
- 3. Sabil(s):
 - Seti Maryam (Bab Al Asbat)
 - Al Ain (Tariq Al Wad)
 - An Nadhir (as part of the An Nadhir street project)
- 4. An Nadhir Gate (as part of the An Nadhir street project)

These project profiles address the issues of conservation and restoration of monumental buildings and special features of different periods and types, which lay in bad repair and are seriously threatened by structural damages and/or disfiguration of their decorative elements.



These projects include a detailed architectural survey of the whole building and relevant details; an analysis of the structural behaviour and deformation pattern and a survey of cracks on relevant elevations and cross sections; the identification of the required interventions of consolidation and the establishment of technical criteria for the conservation/restoration of the architectural features as well as an evaluation of the intervention costs.

b) ADAPTIVE REUSE PROJECTS

5. Hammam al-Ain
6. St. John Hospital
7. St. Archangels Convent
8. Etz Hayim Yeshiva
9. Al Ma'mal tile factory

These project profiles are meant to explore the potential and the opportunities of “adaptive reuse” for economic (i.e. handicraft and commercial) and community oriented activities (i.e. leisure, cultural, educational) of historic unused buildings.

These project profiles include architectural surveys and structural analysis at different scale, mainly aimed at the evaluation of the possible re-use options and approximate costs. Technical criteria will be established for the needed interventions of consolidation and the conservation/restoration of the architectural features.

Concept layout design proposals will be developed for the creation in these premises of community oriented facilities (project 5), cultural activities (project 6, 8 and 9), tourist residences and facilities (project 7).



c) CONSERVATION AND REHABILITATION OF USED BUILDINGS IN BAD REPAIR

10. St. John Charalambos Convent
11. Madrasa al-Kilaniyya
12. Ribat Al Kurdi/Al Mansour (as part of the An Nadhir street project)
13. Khan al-Sultan
14. Suq al-Khattanin

These project profiles address the preservation issues of monuments and historic buildings, which are actually densely inhabited and/or used for commercial activities. Inappropriate uses

are threatening their architectural integrity, but in the present situation no conservation and restoration intervention can be envisaged, as this would involve the relocation of the residents. Architectural and structural survey should be completed by a survey on socio-economic conditions of the resident population and the present activities, in order to suggest possible reversible solutions to improve housing conditions. These project profiles were intended to represent possible “case studies” for the application of the Housing Manual, in order to explore the possibility to preserve architectural features from further disfiguration, whilst improving the housing conditions of the residents and the liveability of the concerned activities. The projects from 11 to 14 have been only partially developed using the available documentation and the information collected during the overall survey of June 2006, since it was not possible to enter the buildings to conduct the necessary architectural and socio-economic surveys.

d) PUBLIC OPEN SPACES UPGRADING

15. Broad wall and Israel Tower
16. Nea Church area
17. Burj el Luqluq area
18. St. Stephen's Gate area

These project profiles address the need to improve the liveability and the environmental conditions in the Old City through the rehabilitation of some open spaces related to archaeological sites, architectural remains and the city walls.

Surveys mainly concern present uses, spatial and landscape structures to integrate the existing documentation.

The opportunities to create or enhance community oriented activities, whilst improving accessibility and understanding of historic sites have been explored.



e) STREET PROJECT

19. An-Nadhir

A street project with the following components has been envisaged:

- Streetscape analysis and improvement, including façade restoration, street paving, shops windows, signage and urban furniture upgrading;

- Analysis of the existing activities and socio-economic conditions;
- Historic buildings conservation and re-use.

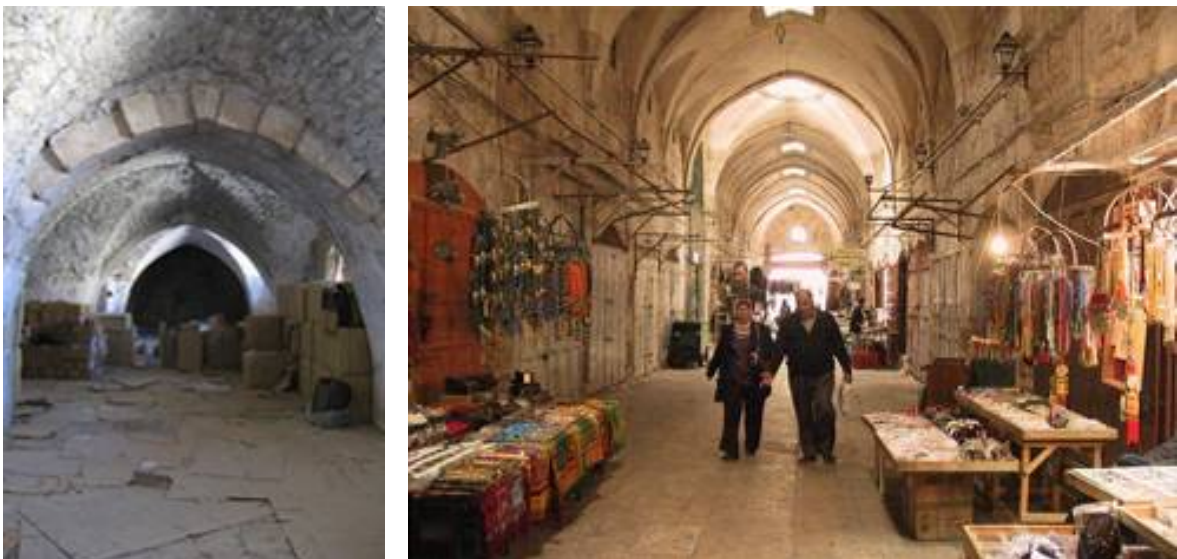
At this stage, the project will focus on:

- Guidelines for the restoration of the facades and refurbishment, and detailed proposals for the restoration of the gate and the sabil (see projects of section 1) ;
- Street repaving, in connection with proposals for the rationalisation of the existing commercial uses and parking;
- Improvement of the streetscape, including proposals for signage, shop windows, cables and wire removal.

The surveys on economic activities and on the state of conservation and use of the existing monuments and buildings should be undertaken with the permission of the concerned parties.

A sample of project profiles is presented in Annex 2.

In addition, making use of the survey carried out to prepare the project profiles of St. John's Hospital and the Suk Al-Khattanin, a first specific architectural and engineering study on the significant and recurrent typologies of cross vaults in Jerusalem has been launched with funds made available from the Universities of Florence and Ferrara, Italy.



Some of the priority projects will be developed as **pilot restoration projects**. They will consist of:

- ♦ preliminary studies according to international technical standards (historical sources, in situ surveys with structures and soil characterization, laboratory tests, structural analysis),
- ♦ restoration works,
- ♦ updating of the information platform of the database to enter the new types of data,
- ♦ development of training and community participation in parallel with the implementation of the works.

3. ACTION TO SUPPORT THE CONSERVATION OF RESIDENTIAL AND COMMERCIAL BUILDINGS

This component of the Plan aims at improving the quality of the housing and commercial building stock and of the living conditions of the inhabitants, while preserving the ordinary architectural elements of the urban fabric as an essential component of the World Heritage Site.

Jerusalem has to be seen and addressed as a living city, with different communities. Housing is undoubtedly one of the priorities: 70 % of the built fabric in the Old City is used for residential purposes and most of the inhabitants belong to a deprived community with very limited income. There is an urgent need to improve the living conditions of the population, taking into account the bad condition of houses and infrastructure as well as the lack of social services, in many areas.

Interventions on the built fabric are often made without technical support and the inhabitants are unaware of conservation priorities. There is an important lack of expertise in conservation. Specific tools need to be developed, such as:



3.1 Rehabilitation manuals

There is an urgent need to diversify the tools, developing a variety of graphic and written communication strategies to suit the various target audiences (architects and engineers, local craftsmen, inhabitants) and respond adequately to their specific skills.

Among the different activities planned for the improvement of the residential and commercial buildings, the first is the elaboration of a “**Manual for housing maintenance and rehabilitation**”, supported by a financial contribution from the Kingdom of Spain.

The core of this work is traditional architecture, essentially civil and domestic, built with pre-industrial techniques and still inhabited. The Manual is a practical and operational

rehabilitation tool for professionals and craftsmen, designed to bring simple and illustrated answers to concrete problems. It is also:

- a survey of the effect of disruptions which, for more than half a century now, have been affecting ways of renovating housing and constructing, as well as on the various ways to preserve old buildings;
- a knowledge and awareness raising tool for decision-makers, professionals and the general public at large, toward the great values carried out by this traditional architecture and the numerous dangers threatening it.

The format of the Manual, addressed primarily to the technicians in charge of the conservation of the site, and to the inhabitants themselves, is a booklet presenting the traditional architecture in the Old City of Jerusalem and a series of fifty-eight illustrated technical cards.

The booklet focuses on the various typologies and construction techniques, with traditional architecture seen as a transmittable heritage as well as a real estate stock, densely inhabited. The illustrated cards show the most common rehabilitation problems and their possible solutions in form of best practices concerning the following:

- pathologies on the structures;
- roofing;
- facades;
- joinery;
- ironworks;
- installations

Two versions of the Manual have been produced in English and Arabic. A Hebrew version is planned. The complete list and two samples of cards are presented in Annex 3.

The Manual is expected to be published in English, Arabic and Hebrew for February 2008. A DVD of all the material would also be compiled with the three linguistic versions.

3.2 Training of technical personnel and awareness raising activities for the inhabitants

Training is known to be one of the essential means to promote appropriate maintenance and repairs. In particular, training for craftsmen and workmen should be developed in order to establish, for example, skilled groups available for specific restoration works, in the exceptional situation of the Old City of Jerusalem where the available professional labour force is presently very reduced.

Awareness-raising campaigns, addressed to different target groups (inhabitants, decision-makers, building workers), are needed so that the communities understand the values of their urban environment and to spread the principles of conservation.

Academic networking could also be a strong tool leading to a broader impact of the mentioned activities.

In the Phase 1, a comprehensive assessment of training needs in the area of heritage conservation and management has been carried out in close cooperation with the

International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM).

Based on this assessment, the Action Plan identifies a number of capacity-building activities to be implemented during its second phase of execution. Due to the limited number of experienced workers within the Old City, basic training programmes for unskilled labour has been included in the Action Plan.

The following activities have been already discussed and agreed with local partners, as the first steps in implementing the training programmes:

- ◆ Development of a funded apprenticeship programme to encourage contractors to train young people. On-the-job training activity will be coupled with simple theoretical courses, open also to local craftsmen to develop specialized conservation skills to meet the conservation and maintenance needs.
- ◆ Awareness raising programme among the inhabitants of the different communities on the conservation of the heritage of the Old City.

The planned time for the completion of these activities is February 2008.

The following items have been identified to be developed in a near future:

- ◆ Training programmes for local craftsmen to develop specialized conservation skills that will meet the conservation and maintenance needs.
- ◆ On-the-job training projects linked to the pilot restoration projects.
- ◆ Support the creation of academic programmes for architectural heritage conservation.



3.3 Study of a microcredit scheme

Microcredit programmes could be an important tool in helping private households provide for some of their basic housing finance needs. Studies to determine the best course of action for the potential implementation of these programmes have been launched, extending the analysis to include small commercial activities.

Particularly, in parallel with the preparation of the Manual, a feasibility study has been undertaken to explore a potential tool for the financing of housing rehabilitation projects. The study consisted of:

- an assessment to generate empirical results on the demand for financial services among the low and middle-income residents of the Old City, understanding basic household repayment capacity;
- financial projections on the basis of the obtained data.

The assessment, carried out on a sample of 250 observations among the residents of the Old City, provided information about the following elements:

- 1) Socio-economic characteristics of the respondents;
- 2) Sources and uses of funds residents draw upon to finance their various needs;
- 3) Formal and informal loans that residents have demanded and used over the past few years;
- 4) Individual loans that potential clients are interested in, and the terms and conditions associated with them;
- 5) The nature of potential home improvement loans based on:
 - the types of homes that potential clients commonly reside in;
 - the typical improvements made in past years; and
 - the types of improvements they are interested in undertaking in the future.

The assessment showed a high potential demand (80% of the sample declared to be interested in accessing home improvement loans) and a potential capacity to repay. The results were used as foundation for microcredit product design. A housing microcredit programme would offer relatively small loans (generally less than 10,000 USD, with a target average of around 3,000 USD for the proposed programme). The developed financial projections indicate that such a programme could serve up to 2,000 households within five years, with a portfolio outstanding of approximately 5.4 million USD at the end of that period. The loan portfolio may be provided through a combination of seed grant and reasonably priced debt.

An additional study to obtain an outline of the microfinance sector in the specific situation of the Old City of Jerusalem with an analysis of the legal framework and an assessment of the most relevant microfinance stakeholders is underway. The study will provide information on:

- Main characteristics of the supply of microfinance services (kind of products offered, kind of target, etc.),
- existence of specific policies and products for housing,
- preliminary assessment of potential interest in developing new products (housing microfinance) and participating in the UNESCO project.
- Recommendations on how to proceed, planning of next steps.

Should the results be encouraging, it will also be investigated whether a group of banks, related to each cultural group, could be formed to administer the microcredit of the funds to the people of the old city. The planned time for the completion of this activity is December 2007.

4 INITIATIVES TO SUPPORT CULTURAL ACTIVITIES

The UNESCO initiative to develop cultural activities side by side with the preservation of the historical sites and buildings in the Old City has been welcomed by the different communities.

Jerusalem faces many problems including poverty, illiteracy, and unemployment. In addition, there is a lack of proper community centres, schools and youth facilities. The exploratory mission of June 2006 obtained an overview of the existing cultural institutions and the bilateral and international institutions which could be interested in supporting cultural development actions for the Old City. The major obstacles assessed are: insufficient meeting places especially for the young, poor facilities, absence of promotional and development activities, low funding levels. This inadequacy of facilities and services exacerbates youth problems.

Strengthening existing institutions looks to be the more efficient means for addressing these issues in the short term. In particular, two institutions – Burj al-luq luq Social Center and Al-Ma'mal Foundation – have the basic infrastructure in place and the potential to broaden the scope and volume of their activities; two of the project profiles presented above aim at improving the spaces pertaining to these institutions. The activities to be developed should have a permanent nature, rather than be “events creation – oriented”, and target youth as a priority.

The most urgent actions identified are:

- ♦ Provide artistic activities for young people.
- ♦ Develop pilot activities using the new technologies.

UNESCO is starting the implementation of some cultural activities, in the form of pilot-projects, based on existing local institutions and exploring the possibility of developing others in the medium term as follows:

♦ **DREAM centres**

The mechanism of UNESCO's “DREAM” Centres (Dance, Read, Express, Art and Music) for young people in conflict or post-conflict situations, already established in Kabul (Afghanistan), Port au Prince (Haiti), Phnom Penh (Cambodia) and currently in Monrovia (Liberia), may be implemented in some existing institutions in the Old City of Jerusalem with funds made available under the “Tribute 21” Felissimo Corporation/UNESCO programme.

This proposal concerns the development of extracurricular clubs for youth aged 6 to 18 in Jerusalem. Four active centres have been selected according to the availability of space and appropriate location. The DREAM clubs will offer sports, music, language and arts lessons as well as a library. Additional activities offered from time to time will include- film day, awareness lectures (lectures on the importance of reading, drug abuse, health etc), puppet shows and plays.

The planned time for the completion of this activity is December 2007 with the available funds.

♦ **Digiarts project: “Scenes and Sounds of My City”**

The UNESCO programme “Scenes and Sounds of My City”, focused on the creative use of communication technologies, enables young people to investigate their urban

environment and share experiences on their cities through workshop lessons as well as through the use of digital material - video, photographic images, and sound projects. The concrete product is a digital project with artistically modified pictures along with sounds of their cities. This should be a pilot project to be expanded to other schools of different communities in the Old City.

The purpose of the pilot project is to invite and guide participants- artists/instructors, youth aged 13-17 from Jerusalem and its vicinity to engage in an art workshop at al-ma'mal foundation, along with staff/ instructors/ artists, working in partnership with community/cultural centres in the old city. The pilot project will include:

- Training programme for teachers and staff.
- Application of the programme among the students and patrons of the cultural institutions.
- A competition of best practise produced through the programme.
- An exhibition at Al-Ma'mal Foundation for Contemporary Art.

Planned time for the completion of this activity: February 2008.

Cultural activities to be developed in the near future are:

a) Medium term

- ◆ Extend the activities to other centres in the Old City.
- ◆ Improve the use of the spaces available for these activities.
- ◆ Expand the activities of existing foundations.

b) Cultural tourism

- ◆ Compendium of cultural facilities within the Old City.
- ◆ Training youth as assistant tourist guides.

c) Crafts

Besides the historical sites and monuments, handcrafted products and souvenirs constitute a visible attraction for the tourists. However, actual product quality is poor and the market is full of imported items. If properly developed and expanded, the Crafts Sector can contribute to the marketing potential of the Old City while offering employment opportunities for women and Youth. Crafts training workshops will be included in the projects in search of sponsors.

5 FUNDING MECHANISMS

UNESCO intends to mobilise international support to carry out the conservation of the cultural heritage of the Old City of Jerusalem.

Requests to donors for funding should ensure that “funding packages” include not only financing of spectacular visible restorations but also of the costs of regular maintenance of the building stock and infrastructure to ensure the sustainability of the programme.

The Plan will investigate the feasibility of the establishment of a loan bank/revolving fund to support the rehabilitation of houses and businesses by their owners, with the collaboration and technical guidance of professional conservators.

The development of the Action Plan will continue with a fund raising campaign to generate financial support for additional projects. The projects to be presented to potential sponsors will consist of a selection of restoration projects chosen among existing project profiles and the additional training and cultural activities that could be developed in the near future.

A booklet containing preliminary project descriptions accompanied by budget estimates to be presented to potential donors for funding will be published before the end of 2007.

ANNEX 1 Members of the International Committee of Experts

Mr Gustavo F. Araoz

Executive Director
ICOMOS/US

Mr Yves Boiret

Head architect for historic monuments in France, Member of the Institute,
historian of the Christian heritage of Jerusalem particularly the Holy Sepulchre

Mr Giorgio Croci

President of the ICOMOS International Committee for the Analysis and
Restoration of Structures of Architectural Heritage

Ms Ulku Izmirligil

Director, Central Laboratory for Restoration and Conservation, Istanbul, Turkey

Mr Vassos Karageorghis

Member of the Institute, former Director-General of Antiquities in Cyprus,
Anastacios G. Leventis Foundation

Mr Saleh Lamei

Director, Centre for Conservation and Preservation of Islamic Architectural Heritage, CIAH,
Cairo, Egypt

Mr Ronald Lewcock

Georgia Institute of Technology, Atlanta, USA

Mr Raif Yusuf Nijem

Chairman of the Restoration Committee of the Al Aqsa Mosque and
the Dome of the Rock

Mr Michael Petzet

President, ICOMOS

Mr Nicholas Stanley-Price (1st meeting) and Mr Mounir Bouchenachi (2nd meeting)

Director-General, ICCROM

Ms Shadia Touqan

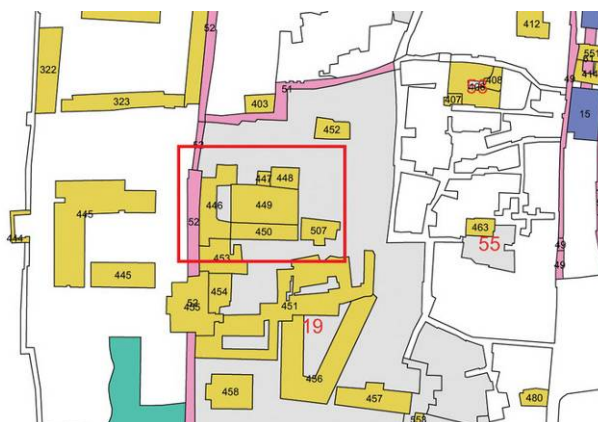
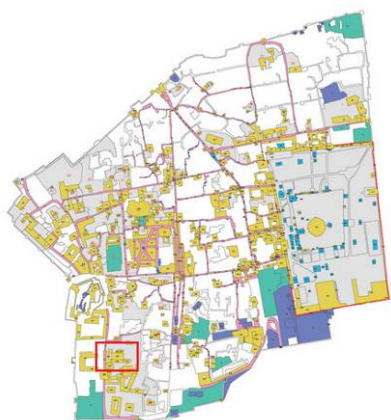
Technical Director, Welfare Association, Jerusalem

Mr Mike Turner

Professor, Bezalel Academy, former president of ICOMOS Israel

Armenian Cathedral of St. James

Inventory position and ID numbers: 447, 448, 449, 450



Naming and ID number from other sources:

UNESCO nomination, 1981	<i>L'église des Arméniens (n. 32)</i>
IAA, 2004	<i>Cathedral of St. James (n. 396, 397, 398, 399)</i>
Welfare Association, 2004	<i>St. James Church / Armenian Complex (Convent and Museum) (n. 9)</i>
Harvard - RSS of Jordan,	<i>Church of St. James the Greater (T023)</i>
TAVO, 1992	<i>St. Menas or Armenische Kathedrale St. Jacobus Maior (1717-1718.1313)</i>
British Mandate map, 1947	<i>Cathedral of St. James (n. 2)</i>

Ownership and concerned stakeholders

Armenian Patriarchate (owner) and the Armenian community

Rationale and objectives

The Armenian Cathedral of St. James responds to the following criteria of selection: a), b), c), d), e). A conservation study was explicitly recommended by the Committee of International experts.

The cathedral represents one of the finest most distinguished religious buildings of the Crusader's Period, holding an utmost cultural and spiritual interest for the Armenians from all over the world and the Christian community. Furthermore it is the core of a larger complex of very high architectural and urban interest, which still houses several monks and families, and the fulcrum of the whole Armenian Quarter.

The state of conservation suffers from several structural pathologies and the bad repair of the very rich inner decoration, depending on the lack of maintenance and studies, as well as on inappropriate interventions.

The primary objective of the proposed intervention is to address the structural and degradation pathologies, so to allow for further restoration works on the decorated surfaces.

Historic Profile

The large patriarchal monastery of St. James was built at the end of the 11th century by King George I, but after the Council of Jerusalem in 1142, it was transferred to the Armenians, which built over it a new church and a monastery, on a site that was identified as the burial place of the first bishop of Jerusalem (St. James Minor) and, according to the tradition, of the head of St James the Major (the Apostle). Some experts argue that the vaulting of the nave and aisles and the arched entrance to the south porch may have been built by the same masons of the Holy Sepulchre.

Since the construction, the complex was inhabited by monks, and included a large hospice for the Armenian poor. In 1165 AD, a new hospital was attached to the church, part of which was built at the behest of the

Armenian's king Haytun II, whose son was buried there. As the Armenian community was very active in commerce, it was able to enlarge and beautify the church and monastery through the centuries until recent times.

The building activities were particularly intensified after the 1840's and the church became the Cathedral of the non-united Armenians, even if no major changes appear in its relationships with the surrounding urban fabric from the topographic maps since 1860's. At the end of the XIX century the Cathedral was reputed for its lavishness, the profusion of ornaments, and the collection of jewelled vestments and manuscripts, which includes the 13th century insignia of the last Armenian king Haytun. According to anecdotic information, reconstruction interventions have been carried out after the 1927 earthquake such as the new reinforced concrete dome of the Cathedral, which replaces the collapsed one with a different shape. No documents however have been made available about the previous state of the building, which may help to appreciate the extent of this major transformation.

Through history, and until 1967, the complex of the church and the monastery has provided accommodation to Armenian pilgrims from all over the world, whilst at critical times it represented an haven for refugees and the local community. From 1915 to 1923 thousands of Armenians flying from persecutions in Turkey were taken in by the St. James Brotherhood, and during the 1948 Arab-Israeli war, because of its one-meter thick walls, the Cathedral has served as a shelter for the community members, who found protection from bombing and air attacks.



Wilson map_1865



Wilson map_1900



British Mandate map_1947

Actual State

The Cathedral building belongs to the larger complex of the monastery, and it is integrated in a rather complex fabric. The main façade with the ceremonial entrance overlooks an inner courtyard, which is only accessible through the aisle of the convent parallel to the Armenian Patriarchate road: it is therefore invisible from the street.

The Cathedral church is regularly used for religious functions and rites, and it is also visited by numerous tourists at the opening hours. The pedestrian accessibility is however made difficult and dangerous by the intense car circulation along the Armenian Patriarchate road, and the lack of safe sidewalk.

The structure of the building

The building has a masonry structure made up with limestone squared blocks perfectly cut and assembled by very thin mortar layers; the floors are made by vaulted system. It is structured in four main parts, built in different times during the Crusader's period, the Church and the West, South and North sides:

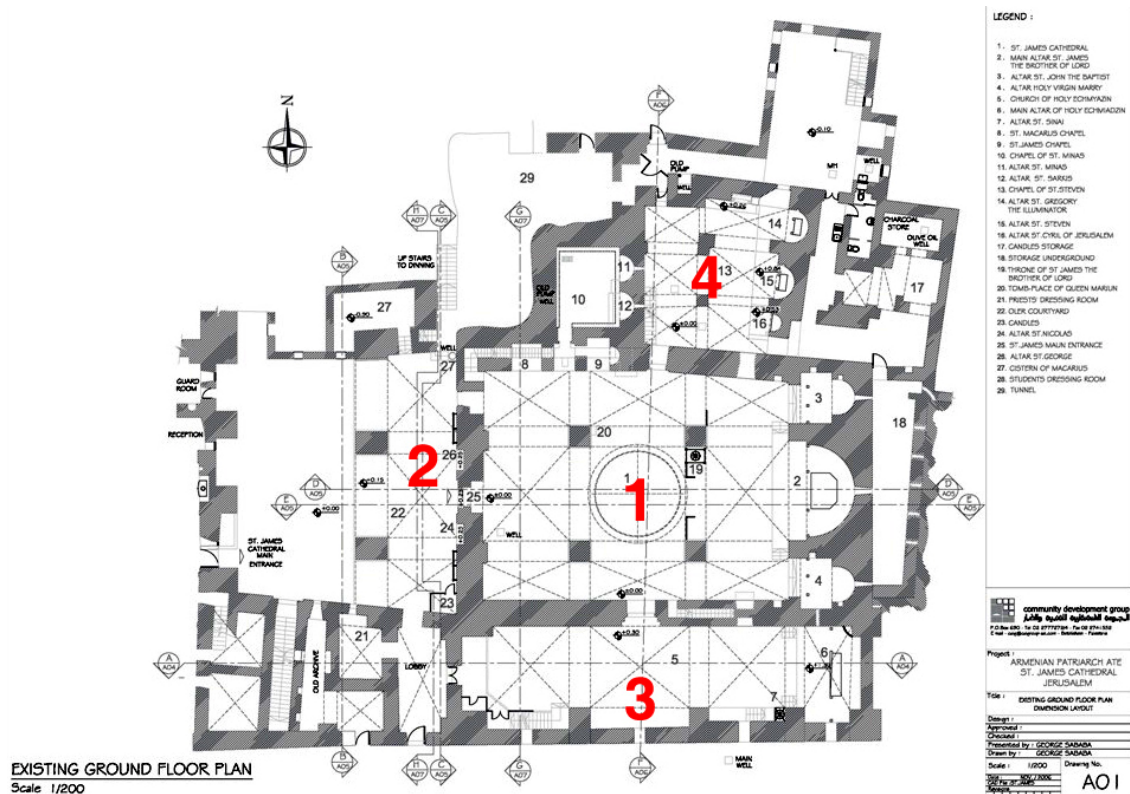
1) The Church has a Greek cross plan with three naves, delimited by the four pillars which sustain the central dome; the main central nave is 6.60 m wide whereas the lateral ones are 3,80 m and 2.70 m wide respectively. Each nave is covered by three cross vaults with 11.50 m and 11.00 m crown heights in the central nave and in the lateral naves respectively. These vaults sustain an accessible flat roof paved with limestone tiles; the central span of the greek cross is covered by a reinforced concrete dome with a maximum height at the intrados of 17.80 m

2) The West side is 1.6 m higher than the church, 7 m large and 18 m long. it consists of the porch at the ground floor that leads to the main entrance, and a first floor that includes the matroneum. The first floor and the roof are covered by three cross vaults spanning 4.80 m each and with 7 m and 14 m crown heights measured from the ground. The vaults are supported by the west wall of the church on one side and by a

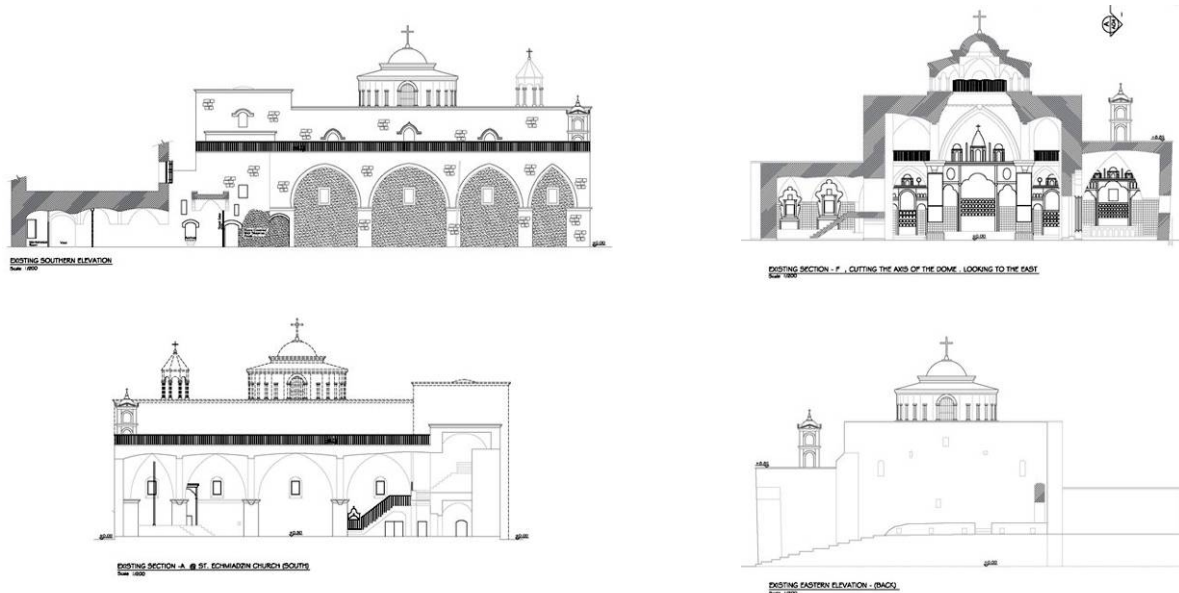
series of pillars, 2.20 m thick, on the other side.

3) The South side consists of the hall of the church of Holy Echmyazin at the ground floor measuring 25x7 m; a staircase connects here the ground floor the hall to the matroneum of the West side. The hall is covered by four cross vaults spanning 5.60 m and with an approximately 7.80 m crown height, plus a small vaulted staircase that takes to the upper floor of the west side; such vaults are supported by the south wall of the church on one side and by a series of pillars 2.5 m thick on the other side. These vaults sustain an accessible, flat roof, paved with limestone tiles, where a small bell tower is placed at the east side.

4) The North side is composed of a series of minor spaces, built in different times; among them the chapels of St. Minas and St. Stephen, usually considered as the eldest church, with the sacristy and other service rooms (stores, wells). These spaces are covered by cross vaults with variable span and height.



Plans of the ground floor

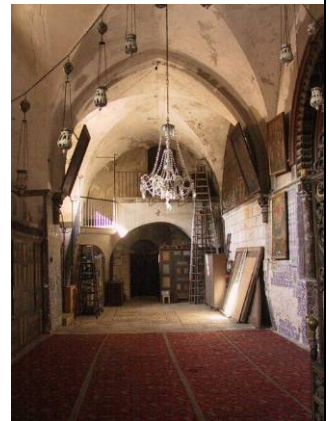


Façades and sections

Photographic documentation



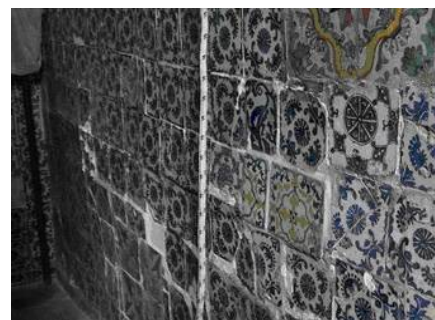
The main façade and entrance from the monastery courtyard (left, center), and the southern façade (left)



The central and the northern naves from the matroneum (left and centre); the entrances to the northern chapels and the church of Holy Echmyazin on the southern side (centre, right)



The dome from the central nave and from the roof (left, centre), and the roof terrace of the cathedral (right)



Cracks in the vaults of the southern and western side (left, centre), and the deterioration of the tiled surfaces in the southern side

Conservation issues

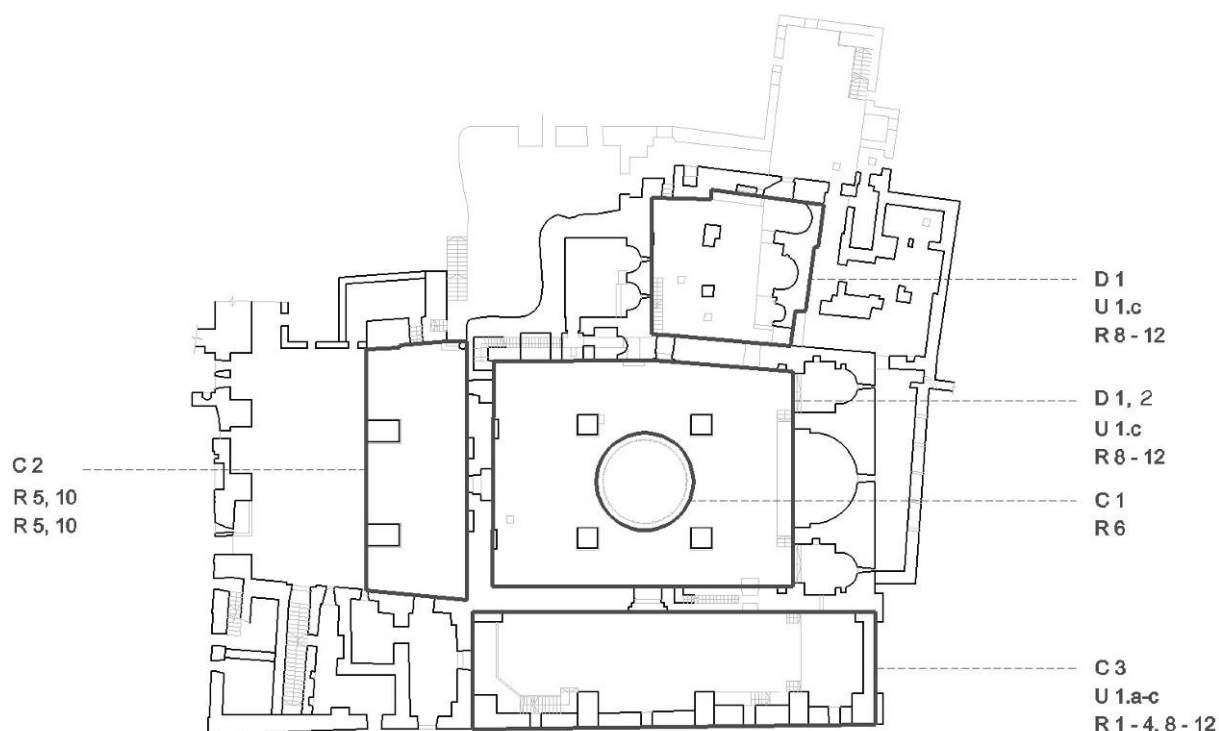
Overall state of conservation

The Cathedral is preserved in its authenticity and integrity, even if the overall state of conservation is rather critical.

There are mainly structural problems concerning the South side, in particular the vaulted spaces and the gallery above the entrance arcade of the church (West side); and it is possible to observe an overall advanced state of decay of the decorated surfaces and of the relative plaster supports.

After the earthquake of 2004 the fractures occurred in the roof of the South part were repaired with cement mortar and the bell was removed from the tower, to be placed on the ground.

In the plan below, the structural problems and the pathologies are indicated, that are described in detail and make the object of the proposed interventions below.



LEGEND D = DEGRADATION; C = CRACKS AND DEFORMATIONS; U = URGENT INTERVENTIONS REQUIRED; R = REINFORCEMENT AND RESTORATION

Structural problems (C)

The following cracks and deformation patterns have been identified:

C1) Church (small balcony of the dome):

- a- cracks in the external ring of the overhanging small balcony under the dome; such cracks originate at the walking level of the balcony in correspondence with the symmetry axes of the southern and eastern arches of the dome; leaning toward south, they reach the extrados of these arches and propagate along the extrados surface without involving the thickness of the arches

C2) Western block:

- a- small cracks on the vaults covering the ground floor; in particular in the central vaults cracks can be seen in correspondence with the main axes of the vault and with the springs of the internal wall
- b- cracks on vaults of the upper gallery (including the vaults above the stairs leading to the gallery); such cracks have a SO-NE direction in the staircase vault and in the southern vault of the gallery, and a NO-SE direction in the northern vault of the gallery; in the central vault, the cracks have a

crossed pattern

- c- cracks in the junction area between the gallery vaults and the nave vaults
- d- cracks in correspondence with the central window of the western wall (main front of the complex) and with the window of the northern wall

C3) Southern block

- a- marked slope of the southern piers which bear the cross vaults
- b- cracks in correspondence with the junction area between the vaults and the southern wall, visible even at the extrados of the vaults (on the flat roof a crack can be seen in E-O direction)
- c- diagonal cracks in the plane of eastern and western walls of the hall
- d- deformations in the geometry of the stone arches dividing the cross vaults

The possible cause of cracks and deformation patterns C1 and C2 can be found in the Earthquake of 2004, due to a mutual hammering between the church and the western block caused by the major height of the block that gives rise to a detachment of the gallery vaults from the nave vaults. The crack pattern of the western block may be caused by twisting movements occurred in consequence of such a detachment.

As for the cracks and deformation patterns C3, the possible causes are the following:

1. Vault thrust onto piers; it can be noticed that the hall is covered directly by the roof without any intermediate floor: the lack of a stabilizing weight make the piers, despite their 2.5 m thickness, unable to bear the vault thrust
2. The 2004 earthquake widened the existing cracks (in particular, the one in the hall roof, filled in with cement mortar); it probably widened (or caused) the diagonal cracks on the eastern and western walls (in-plane shear cracks)

Degradation of materials and surfaces (D)

The following pathologies have been observed:

D1) swelling of the mortar layers under the tiles at lowest level of the walls and subsequent expulsion and/or rupture of the tiles; such a phenomenon is spread all over the building

D2) detachment from the walls and physical decay of the wooden supports of the paintings which cover the internal surfaces of walls (in the past such decorations were hidden behind large canvass paintings)

In both cases, the possible cause of degradation is the humidity, with subsequent damaging of the lime mortar supporting the tiles and the wooden painted panels

Proposed conservation interventions

The following interventions are recommended, that are indicated on the plan above:

Urgent interventions

U1) Monitoring the present conditions of the complex with weekly-monthly inspections and appropriate measurements, in order to acquire information on the evolution of the material and structural decay affecting the building. On these basis it will be possible to reach a better understanding of the causes of the damage and to provide appropriate interventions in order to prevent a worsening of the damage. In detail, this action should include: (see ANNEX 1):

- a- Monitoring the crack width on vaults and walls (B 10.10)
 - cracks in the west and east walls of south hall
 - cracks at the junction area between the vaults of the south hall and the south wall
- b- Monitoring the slope of the southern walls of the complex; a device should be placed on each pier which bears the vaults of the south hall (B 10.12)
- c- Monitoring the hygrothermal conditions of the masonry works (walls and vaults; B 10.13)

Medium and long term interventions (R)

The proposed interventions of reinforcement and restoration, which are identified on the plan above, have been selected on the basis of the available information and with reference to the technical literature; the application of more appropriated or detailed solutions will strictly depend on the results of further studies and insights.

- R1) Underpinning of the southern and western walls
- R2) Insertion of iron tie rods or reinforced concrete connections in the junction area between the east and west walls of the south hall and the south wall
- R3) Insertion of extradosal tie-rods above the vaults of the south hall
- R4) Reinforcement interventions on the west and east walls of the south hall in order to enhance their in-plane shear resistance (thickening of the masonry, use of fibre-reinforced materials)
- R5) Tying up at the crown section of the west block (fibre-reinforced bands)
- R6) Consolidation of the small balcony under the dome by strengthening the connections between the balcony itself and the bearing walls behind (steel bars)
- R7) New waterproofing system on the roof of the church and re-design of the raining water waste disposals
- R8) Interventions for the reduction of the humidity in the complex (foundation drainage disposals, waterproof films to be inserted at the basis of the walls, forced aeration system, water-repellent plasters where possible)
- R9) Remaking of the church pavement by laying the historical elements over a new crawl space to be built
- R10) New plasters on the walls to be covered
- R11) Removal of the ceramic tiles, insertion of a new support made with hydraulic mortar and final fixing of the tiles
- R12) Removal and restoration of the painted wooden panels, fixing of the panels on new supports that will isolate them from the humidity of the walls

Technical criteria

The interventions of structural reinforcement and restoration should be preceded by preliminary analyses in order to acquire a higher level of knowledge regarding the building. These have been schemed in a comprehensive procedure that is proposed in annex 1 and includes:

- a- The collection and interpretation of the historical documentation from archives;
- b- In-situ surveys for the characterisation of the structures (constructive techniques, Working conditions of the structures) and the soil;
- c- Laboratory tests on materials and soil;
- d- Structural analyses (static and seismic vulnerability).

All the interventions have to be consistent with the established international conservation codes, and respond in particular to the following criteria:

- reversibility, non-invasivity and recognisability
- compatibility with building typology, constructive techniques, structural behaviour and traditional materials

Cost estimate

Preliminary studies: 60.000 UDS

Reinforcement and restoration interventions: 1.089.000 USD

Possible training and awareness component

Awareness Raising in the Armenian Community

This training/awareness activity should consist of a series of meeting with stakeholders of the Armenian community. These stakeholders should include key members of the Church as well as the community at large in the Old City. The meetings should be used as a means of dialog and exchange regarding the heritage values of the Cathedral of St. James and the planned project. It should also provide the community with an understanding of the World Heritage Convention.

Short Course on Management, Maintenance, and Repair of Buildings

This short course should be for those charged with the day to day management and maintenance of the church. A study will need to be made by the training team to look at the specific management, maintenance, and repair issues at the church. This course should be as hands-on as possible.

Professional Conservation Training on Structural Issues in Religious Buildings

The Cathedral of St. James provides a very interesting case study related to structural problems of religious structures in the Old City. A course could be organized for professionals to help them to understand the pathology of structural problems, methods of monitoring, and finding appropriate solutions.

OCJ
Summary - List of cards

- 1.01 - Consolidating a foundation
- 1.02 - Consolidating a wall by grouting (injecting hydraulic lime mortar)
- 1.03 - Rebuilding a stone wall
- 1.04 - Removing plants from walls (superficial plants)
- 1.05 - Removing high plants from walls (deep plants)
- 1.06 - Observing a crack in a stone wall
- 1.07 - Repairing a crack in a stone wall
- 1.08 - Repairing and renovating a damaged stone.
- 1.09 - Replacing a damaged stone
- 1.10 - Preparing lime putty
- 1.11 - Temporarily supporting a wall bulge
- 1.12 - Fixing a bulge by rebuilding a segment of a wall
- 1.13 - Consolidating a stone wall with anchoring system
- 1.14 - Consolidating or replacing a broken lintel
- 1.15 - Gluing broken stones
- 1.16 - Repairing stone in contact with metalwork
- 1.17 - Repairing the deteriorated connections of a wooden roof structure
- 1.18 - Fixing arches in galleries
- 1.19 - Consolidating a cross vault
- 1.20 - Repairing a stone dome (deep cracks)
- 1.21 - Maintaining a lime mortar dome (superficial cracks)
- 1.22 - Treating flooring settlements

- 2.01 - Improving the waterproofing of a cement roof
- 2.02 - Improving the waterproofing of a rendered or tiled roof
- 2.03 - Fixing a pottery parapet (parapet Mashrabiyya)
- 2.04 - Maintaining a red roof)
- 2.05 - Improving critical points in red roofs
- 2.06 - Fixing a wooden cornice
- 2.07 - Fixing a stone cornice

- 3.01 - Preparing and applying a limewash
- 3.02 - Repairing cracks and the detachment of lime plaster
- 3.03 - Preparing and applying a lime rendering or plastering
- 3.04 - Temporary Façade Decoration (Post-Mecca pilgrimage)
- 3.05 - Halting the rising damp process
- 3.06 - Protecting and renovating a facade with a sacrificial layer
- 3.07 - Fixing damaged joints

3.08 - Cleaning a façade

3.09 - Cleaning a facade from crystallized salts (efflorescence)

4.01 - Protecting and treating an external woodwork (windows and doors)

4.02 - Fixing a joinery work (superficial repair)

4.03 - Maintaining a joinery work (fine repair)

4.04 - Improving air insulation in a wooden joinery

4.05 - Improving the waterproofing of a wooden joinery

4.06 - Improving the waterproofing of a wooden joinery (2):

4.07 - Treating superficial wood damages

4.08 - Repairing a protruding timber screen (Mashrabiyya / Balcony)

4.09 - Replacing the deteriorated segments of a decorative ceiling

4.10 - Enhancing storefronts and shading

5.01 - Repairing the ironmongeries used for windows and doors

5.02 - Treating rust

5.03 - Fixing the defective joints between metallic elements in-situ

6.01 - Placing the contemporary equipments on external surfaces

6.02 - Introducing and placing contemporary facilities inside old houses

6-03- Improving natural light and illumination

6-04- Bringing fresh air and natural ventilation

6-05- Improving the position of technical equipments on the roofs - Antennas, (TV, Phone.) water-tanks, solar panels

6-06- Distributing technical infrastructures from roofs to housing units

6-07- Sewage and rain water

Here below two examples of cards:

1-02- Consolidating a wall by grouting (injecting hydraulic lime mortar)

Level of Competence

- ☐ the users
 ☐ worker, new building craftsman
 ☐ worker, traditional craftsman
 ☒ architect, expert in architectural heritage

The Element's State of Conservation and Description

The grout (liquid lime mortar) is an adhesive substance, a binder which is made from lime and fine sand; it can be injected into the structure of a damaged building to replace or complement the old mortar lost within the damaged stonework.

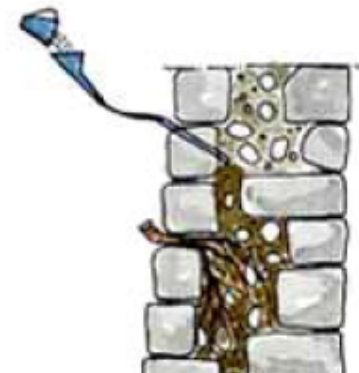
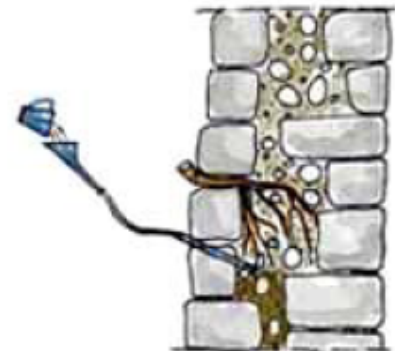
Problem's Description and Diagnosis

During the various movements of the stone structure, the lime mortar deteriorates and disintegrates either partially or totally, due to water penetration through the building's structure. This causes the structure to lose its technical integrity, and weakens its load bearing capacity.

The Description of Interventions/Maintenance

The process of injecting the building's structure with liquid lime mortar (grouting) is as follows:

- Cut or rake out the stone pointing and re-point with lime mortar, the mix being lime to fine sand (2- 3 mm) 1 to 3; the sand component can vary depending on the size of the joints. Thus, one should add more lime where the joints are narrow; the mortar being less liable to contraction.
- After wetting, the structure is injected with hydraulic lime mortar combined with water, in a ratio of 1 to 1. If hydraulic lime is not available or difficult to obtain, then add brick dust (from pottery or red tiles) that contains high percentage of Aluminum Oxide and Ferric Oxide to lime putty in water. It is also possible to add pozzolanic material (such as pumice). If brick dust or pozzolanic materials are not available or expensive, a small amount of cement (up to 25% of the binding material) can be added to non-hydraulic lime slaked with water, in order to ensure the strength required for the stonework; the injection is carried out in phases of two courses (max. 1m) at a time, until the wall is completely filled.
- The mortar is mixed, using an electric drill fitted with a mixer blade. The mortar has to be injected deep into the walls. An effective method is to use a gravity system with a funnel end. Another similar system uses a gypsum container in the shape of a swallow's nest. This is mounted on the wall, the grout is poured in and the mortar disperses through the cavities and joints of the stonework. A plastic bottle can also be used, cut vertically, inverted to form a half funnel, and placed against the wall. The nozzle of the funnel should be placed tight against a horizontal joint. Care should be taken not to permit the mortar to leak out from the cut face of the funnel onto the general wall surface.



Caution !

- Avoid injecting non-hydraulic lime mortar.
- Avoid injecting the mortar over too great a height of wall in a single phase, so as to prevent the mortar from being forced back out of the wall due to pressure or causing the wall split and burst.

1 –16- Gluing broken stones

Level of Competence

- ☐ the users ☒ worker, new building craftsman ☐ worker, traditional craftsman ☐ architect, expert in architectural heritage

The Element's State of Conservation and Description

Textured stonework is commonly used in traditional buildings where it is found in floors as tiles, in facades, lintels, windows and doors frames and in ashlar walling. It is also found in the construction of domes, columns, bases, capitals. Such stonework has different characteristics, different colors and different shapes (lime painting or molded gypsum works).

The stone is generally bonded with lime mortar of fine consistency. It may also be bonded with lead sheet 1-2 mm thick, laid in the horizontal joints (as in the lead school in the end of the Mamluk era).

Problem's Description and Diagnosis

Depending on location, textured stonework is exposed to many factors, from vastly different climatic conditions of rain, wind and snow, to physical conditions such as earthquakes. Reaction to these conditions results in different types of fault in the stonework.

Sometimes, the stone has inherent defects or faults, unseen hairline cracks in the surface of the stone, that themselves cause cracking. The defects are easily seen in damp stones after it dries. In general, when the stones crack, sides move and part, causing damage or failure of the stones above.

Maintaining the structure of a building is traditionally done by removing the defective stonework. This one is replaced with stone similar in shape and size, and bedded in a matching mortar.

Alternatively, after supporting the stonework, the defective stones can be removed and repaired by gluing the cracked elements. One avoids the problem of cutting out the stones and finding a replacement with the same qualities. It also has the advantage that the authentic material is kept in its original place.



The Description of Interventions/Maintenance

Repair method for gluing broken stones (Removal and re-installing are not described here). This method can apply to all types and sizes of stone.

Preparation of the stone surface: Remove dirt and dust from the surfaces on which the glue is to be applied, using a brush and water. Clean surfaces and leave to dry.

Positioning the stone: The larger section of the broken stone is placed on the ground, alongside a vertical board, slightly inclined. The board shall be at least equal in length to the complete stone. Wedges in the lower part of the stone will ensure that it remains steady and will not move or fall forward. It is imperative that, before gluing, one tests that the surfaces to be glued are a reasonable match.

Supporting the glued surface with reinforcement: Reinforcement is inserted in a similar position to that in concrete reinforced with steel. For example, if the stone is spanning an opening, one must place the steel in the negative (lower) part of the stone. To locate the exact position of the hole to be made in a two-piece stone, one paints the position of the holes in the first piece of the stone. The second piece is then positioned on top. When removed, there should be a trace of the paint spot, indicating the position of the hole to be drilled in the second piece of stone. The drilled holes must be slightly larger in diameter than the reinforcing rods to be inserted (in order to leave enough space for the rods and glue). The holes must then be cleaned. Preferably, the bars should be of rust resistant material (fiberglass, tephlon or stainless steel rods).

Gluing method: First test a small amount of the adhesive. One might wish to add coloring or mineral paint to obtain a matching colour/tone to the individual stone. The coloring process must take place before adding the catalyst. Mix the catalyst with the adhesive quickly. It may be as short as 4 minutes at 20 C°. The bars and the stone surfaces are coated with the mixed adhesive. The surfaces of the stone, with the bars now inserted, are brought together. To hold the pieces, wedges can be used. The gluing procedure may be completed in 15 minutes to 24 hours (see manufacturer's instructions).

Cleaning: Clean the excess material using a trowel or a knife before it sets (the lower part should be protected with a plastic or paper tape). Alternatively, ethyl alcohol on cloth may be used to clean any excess material from the surface.



Caution !

- Do not attempt to bond with any kind of mortar, since it is very thick and weak.
- Test every step before actually doing it.
- The adhesive used is flammable and may cause damage when inhaled as it is an irritant to both skin and eye.
- The gluing procedure must take place very quickly, since the adhesive dries fast. Carry the procedure in the coolest space available without direct sunlight.