1986 TECHNICAL REVIEW SUMMARY

Conservation of Mostar Old Town
Mostar, Yugoslavia

733.YUG.

Date of Completion: 1978 and ongoing

I. OBJECTIVES

1. The restoration and preservation of the historic centre of the 16/17th century Ottoman town of Mostar (noted for its famous bridge), and the documentation of the town's rich building heritage.

2. The revitalization of the commercial and business centre of the old town by a programme of re-use of the restored shops, offices and other buildings to rehouse traditional craftsmen and artisans; and the upgrading and provision of modern facilities for the local population, as well as for the tourists, within the traditional town setting.

II. TOPOGRAPHY, DESCRIPTION AND HISTORY OF MOSTAR

1. The town of Mostar is situated 56 km inland from the Adriatic Sea up the Neretva River Valley, some 150 kms north-west of Dubrovnik on the Dalmatian Coast. It is the second largest town in the Republic of Herzogovina; 85,000 inhabitants live within the town, although the extended community numbers some 120,000. The Neretva Valley is relatively narrow at Mostar, with steep and impressive limestone mountains covered with scrub and fir trees towering over the townscape. The valley, widening out below Mostar, is agriculturally very rich with many fruit orchards, farms and vegetable gardens. Some light industries are also found in the area: a hydro-electric plant, tobacco and cotton factories, an aluminium plant, a distillery (Mostar is famous for a dry, white wine), and numerous fruit juice factories.

The region is famous for its many crafts, some of which are still practised in Mostar, including tanning and leather work, jewellery (especially filagree work), wood carving, coppersmithing, embroidery, blacksmithing, and kilim and saddle making.

2. Most of the old town lies on the left bank of the Neretva River, which is more level, and a small section extends over the bridge to the right bank. The core area of the old town is 742,000 square meters.

3. Mostar originated as a small settlement some 500 years ago with a suspension bridge ("Mostari" means bridge-keeper) and a few houses. Its main period of expansion dates from after the arrival of the Ottomans in Herzogovina and their building of a permanent bridge with flanking towers across the Neretva between the years 1557-1566. From about the middle of the 16th century, a thriving business centre and town developed around this focal crossing point. It continued to flourish throughout the 17th century, by which time the town comprised over a thousand houses. The Ottoman Period, therefore, is well represented by a rich variety of public and private buildings. The following period, under Austrian rule (1878-1918), is also well represented in Mostar by streets of shops, public buildings and an army barracks. The town's present population is divided almost equally between Muslims, Orthodox and Catholics; the latter two were allowed to build churches only in the 19th century.

III. History of the Project :

The community of Mostar founded Stari-Grad in 1977 as a work organization set up to deal specifically with the restoration and preservation of the old town; the community had grown dissatisfied with the "talking bureaucracy" that formerly had been responsible for the old town. Dzihad PASIC was appointed Director of the Organization; he had, since 1969, been Inspector of Monuments for the Republic of Herzogovina and had been involved in the restoration of old buildings for years. In fact, it was Dzihad Pasic who prepared all the documentation for the founding of Stari-Grad. He brought in Amir PASIC (not a relative) as his assistant in April 1979, and together they started the documentation centre.

Stari-Grad is a semi-autonomous organization approved and subsidized by the Ministry for the Protection of Monuments and Nature of the Republic of Herzogovina in Sarajevo. An area covering 742,000 sq.m., i.e., the central core area of the old town, was given over to Stari-Grad; all the rents, taxes, dues and income from advertisements, cinemas, etc., collected from this zone go to the Organisation and form the basic part of their annual budget. This inner zone area is now being extended to include more of the Austrian town.

IV. Work procedures :

1. The core of the old historical town was surveyed, mapped and planned.

2. Every historic building or group of structures was numbered, registered and mapped at 1:500, then foundations, facade and sections at 1:200, then at 1:50 with absolute levels; specific details were drawn at 1:20.

3. All the data pertaining to a structure was collected, and a dossier compiled to include historic photographs, etchings and literary references. Archaeological and art historical on-site analyses and investigations are also carried out. This procedure is carried out for every building within the zoned area; it took Stari-Grad three years to fully document the historical city core.

4. Detailed examinations are conducted on the rate of deterioration and the state of repair of each building.

5. Before any restoration work can begin the following steps must be completed by Stari-Grad :

   a. A detailed and analytical plan of action with all plans of reconstruction must be prepared (always subject to change).

   b. "Anketni" or questionnaires are distributed to the community; the answers and opinions returned are discussed at open meetings with various representatives from the community. All resolutions passed at these meetings are

published. Sometimes as many as 2400 "anketni" are returned.

c. Approval of the programme must be obtained from the Ministry for the Protection of Monuments in Sarajevo for all buildings listed in Category I. Category II buildings can be decided upon by the community, with the approval of the local Commission for Housing.

6. Detailed plans are also drawn up for the following within the zoned area; the actual actions are carried out by the relevant authorities :

Traffic control (Traffic Department);
Telephone system (PTT);
Sewage and water system (Electricity Board);
Electricity and wiring (Electricity Board);
All finishing details (sub-contracted to specialized firms).

7. All restoration work is done under the control and supervision of Stari-Grad, thereby ensuring a high and even standard of workmanship. The re-use of restored buildings is also controlled by them, with strict conditions and obligations for the upkeep.

8. Industries, like the Hydro-Electric Plant, are frequently asked to donate their service and/or equipment and heavy machinery for the work; in particular this was the case for work on the bridge.

9. The rent from finished and renovated buildings goes back to Stari-Grad, who re-invest it in the next restoration budget.

V. Budget

The annual rents and dues from the zoned area are estimated and each year's work is planned in advance. An overall Four Year Plan is made with estimates which have to be approved by Sarajevo and then included within the overall city plan. (The 1986-1990 budget plan is now being approved). Stari-Grad therefore knows in advance the budget at its disposal and plans with priorities in mind. Since as many as three or four projects are going on at the same time, it is difficult to

separate the budgets, especially since the same masons will work in two or three buildings at any one time.

A constant problem in Yugoslavia is the ever rising inflation rate; inflation factors have to be estimated and included in any budget. Thus far, Stari-Grad has been relatively accurate to forecast such estimates. A special fund must also be set aside for rehousing or buying up a shop or house. The rehousing of owners while their building is being restored is usually easy; they are housed in local housing projects. Time estimates are also accurate and adhered to for the sake of inflation. Stari-Grad began with an annual budget of US$ 5000 in 1978 (about 25 million Yug. Dinars), and now has an annual budget of over US$ 20,000 (600 million Yug. Dinars). Recently, 40% of the estimated value of any new building project outside the immediate zone was granted to Stari-Grad, somewhat like a VAT. This will increase the potential for future budgets.

VI. Construction and Restoration Methods

1. All historic buildings in Mostar were built of either a conglomerate mixture of rock and river pebbles and using a lime mortar, or with "teneliya" blocks, an oolitic limestone, also used with a lime mortar. Interior partition walls were sometimes constructed of baked bricks. The interior finish was done with a lime plaster, while the exterior façades were usually left unplastered (houses excluded). A lot of the detailing was done with wood, especially the houses and shops. All these materials are found locally and the "teneliya" mine is still in use.

2. Stari-Grad uses traditional building methods whenever they can, but since Yugoslavia lies in an earthquake zone, laws require every building, including restorations, to have structural reinforcement. This has been done discreetly so that the reinforcement does not show.

3. Only industrial lime is available in Yugoslavia today. This is not as strong as traditionally fired lime, so Stari-Grad have "invented" a mortar that consists of three parts lime to one part cement, which has proved to be a successful and strong mixture.

4. Interiors are finished with a lime plaster that is then given a coat of white paint; exteriors are mostly left unplastered.

5. When major rebuildings have been necessary, these have been done with a concrete frame, brick infill dividing walls, and stone facing on the façades.

6. All new roofing is done with traditional materials, slate tiles ("ploca") over a wooden frame, the overlaps sealed with a lime mortar.

VII. Labour Force

All workers and craftsmen used by Stari-Grad are local, and include:

2 stonemasons (K. Zahir, K. Halil) : (all from GRO "Gradzep")
1 slate roofer (S. Hamdija) :

1 carpenter/wood specialist (J. Stjepan) : (from the union of
1 blacksmith (B. Senad) : craftsmen "UniZanat")

All skilled and unskilled labour are hired from local firms who subcontract from Stari-Grad; the same workers have been working for them now for five years. Other skilled jobs (plastering, plumbing, etc.) are also subcontracted to specialized firms in Mostar.

VIII. Restoration Works

Restoration by Stari-Grad can be divided into two groups :

1. restoration and renovation.
2. major rebuildings.

A. Restoration and Renovations

The Bridge, "Stari Mostar" across the Neretva River.

This bridge, one of the most famous landmarks in Yugoslavia, is a masterpiece of Ottoman architectural and engineering skill, and was completed in 1566, after a construction period of nine

years. It was designed and built by the architect Hajrudin (Khairuddin), a pupil of the great Ottoman architect Sinan. It has a high arched span rising some 27 metres above the level of the river, is 4 metres wide, and has an overall length of 30 metres. It is built mainly of "teneliya" blocks. Raised bands of stones, roughly 60 cms apart, lead up the steep slopes of the bridge.

Repairs have been carried out on the bridge in the past, but scientific and systematic studies began only in 1970 when Dzihad Pasic wrote the first major report; the bridge was drawn and each stone numbered. In 1979, a preliminary underwater structural examination revealed major weakness in the natural rock under the footings of the bridge. The right bank in particular had been eaten away by the erosive actions of the Neretva, thus creating caverns under the right foot. So with special divers and underwater equipment loaned from the Hydro-Electric Plant, the caverns were checked, drawn and core samples taken for analysis. Steel bars were then driven into the bedrock, the overhang strenghtened and the whole area filled in with reinforced concrete. The operation was filmed on video with underwater cameras, and completed by 1982.

Although the bridge itself is quite stable (it survived World War II when the Germans filled the steppings with sand and drove their tanks across it), it is constantly monitored and examined. In 1985, while working on the upper vaults, checking each stone and its state of "fatigue", small circular holes were discovered in the vaults. Water, seeping through the interstices, was freezing in these hollows, and could have caused damage in the future. It was therefore decided to waterproof the interstices between all the stones on exposed surfaces. A bonding and waterproofing material called Cibafix was chosen as being the best available on the market; it was ordered from Switzerland and will be applied on the bridge in March 1986.

Cost of foundation repairs : US$ 45,000 in 1982.

Estimated cost of repairs on upper vaults : US$ 36,000, 1985 and ongoing.

Tower "Tara" (left bank) built in 1576, after the bridge, but, as part of the same complex. It had been restored in 1737, but by 1982, was in very poor condition on the interior. The walls were strengthened with reinforced concrete on the interior, the roof was completely re-done and the interior spaces were redesigned as artists' ateliers. No central heating was installed so that although all the studios are rented out they are only used in summer.

Total costs : US$ 33,000 in 1982.

Hadzi Megmed Karadzoz Beg Mosque was built in 1557 by order of Sultan Suleiman the Magnificient himself; it is a classic Ottoman mosque built by the same masons that built the bridge. It is a square building, 13.40 x 13.40 m., and has richly painted interiors. Stari-Grad required the open porch "hayat" roof, all the rotten wood in the panelling was replaced and new lead sheating put on top. The gardens and the cemetery that form a part of the complex were cleaned up and landscaped.

Hadzi Mehmet Karadzoz Beg Madrasah in the same complex but built later in 1562, was also repaired. The wooden framework of the roof was rebuilt, the slates were replaced and new lead sheating was put over the domes. Both are still used by the Muslim population for prayer and studies.

Time span : 7 months in 1978, 1 month in 1985. Costs :

Clock Tower "Sahat Kuly" was built in the 17th century; it was in poor condition and needed repairs. The upper part was restored, the conical capping rebuilt and new lead sheating put over it. The interior steps had to be completely rebuilt, these were done of oak. The Genoese clock was repaired and now works well. The garden near the tower was landscaped and the steps leading up to it were repaved.

Time span : 7 months in 1982. Costs :

Roznamedzi Ibrahim Effendijina Mosque was built between 1621-1623 by Ibrahim Effendi who was roznamedzi (controller/secretary) to Sultan Murad IV (1633-40). It is a small square mosque, 9.65 x 9.65 m., with a single dome and an elegant minaret with very fine muqarnas decoration. A section of the uppermost part of the minaret fell in 1970 crashing through the domed roof and damaging it. The minaret was restored by D. Pasic in 1970 before the founding of Stari-Grad; the rest was completed by them in 1978. They repaired and replaced the damaged wooden panelling that decorates the interior of the dome and redesigned the space inside for use as an exhibition hall or gallery. Plain iron rails on three sides allow for the easy hanging of paintings, the lighting, mainly spots, is discreetly handled. The "hayat" was also repaired, i.e. the roof. Good reuse of space.

Time span : months in 1978. Costs :

Shops, Offices, business district (left bank) consisting of some 30 shops and offices that have been restored on the left bank of the Neretva River, including the headquarters of Stari-Grad, a double storied office. The shops are tiny wooden cubicles, the larger areas have been turned into restaurants. The restoration consists mainly of redoing the roofs (wooden frame and slates); all the interiors are provided with modern facilities. All the details of the roofs, hinges, wooden slats, sills, overhangs, etc. have been faithfully reproduced according to traditional methods. The shops have been rented out to local people and artisans, these include 1 sculptor, 1 wood-carver, 2 shoemakers, 1 coppersmith, 2 jewellers, 4 galleries, few small businesses, two local crafts shops and numerous cafes and restaurants catering for the locals and for the tourists. The interior decorations were done and paid for by the individual leasors, but they had to be approved by Stari-Grad.

Time span : 1978 -

Water Mills (right bank). This group of small mills below the tannery were restored, reroofed and rented out as restaurants (closed in winter).

Kajtazova House, originaly built in the 16th century, it has undergone many restorations. Stari-Grad restored and cleaned all the wooden elements, repaired the roof and advised the owners on the arrangement and decorations of the interiors - the objects displayed, however, all belong to the family. The house is now open to the public as a Turkish House Museum. The details and the presentation have been well done.

Biscevica House, a large mid 16th century house now subdivided into three parts and owned by three different families. The roof of one section was redone. It is used privately.

2. Major Rebuildings

Koski Mehmed Pasha Madrasah and embankments. The madrasah was built by Mehmet Koski who was roznamedzi to the Grand Vizier Lala Mehmed Sokolovic (1604-1606), in the year 1618/1619 (date of the mosque complex), and is situated on the left bank of the river. The madrasah was still in use in 1937, but was neglected during WWII and fell into a ruinous state. In the 1950's, it was razed to the height of one metre, the whole becoming part of an open air market. It was rebuilt from photographs; the ground plan was excavated and the room divisions were kept the same. It was constructed with "teneliye" limestone blocks and lime mortar but was strengthened on the inside with reinforced concrete. All finish and wooden details, the chimneys, doors and windows were reproduced, copied from photos of the original details. Modern facilities were incorporated into the building without changing the floor plans. The roof was made using traditional slates on a wooden frame. When the building was completed, it was rented by the Tourist Bureau (the Assistant Director's father was, ironically enough, the old imam who taught in the madrasah). Stari-Grad also rebuilt the embankment, the ruins along the fountain in the courtyard were also repaired.

Time span : 1 year, 1979. Costs : US$ 690 per sq.m.,area is 260 sq.m., Total US$ 179,000.

Business District, "Prijecka Carsija" (right bank) on the street leading up the right bank from the bridge and consisting of about 30, shops dating mainly from the 18/19th centuries, and all in a very ruinous state. They were pulled down and completely rebuilt, some of wood, some in limestone blocks and cement, according to their original designs. All finishing and final detailing were also done according to traditional, original plans. The shops and premises have been rented out as galleries, restaurants or as craft shops, including a blacksmith, a wood carver and a shoe-maker.

Time span : 1985-1986 Costs : US$ 540 per sq. m., area 500 sq.m., Total : 270,000 US$

Dzemal Bijedic House dating from the end of the 18th century, was the house of the national hero and long-time President of the Federal Executive Council, Dzemal Bijedic. It was in a ruinous state and was rebuilt using a concrete frame with brick walls and infill. The house was turned into a museum with mementos, photographs, and other objects pertaining to the President's life both in Mostar and outside.

Biscevica House, another section, was rebuilt by Stari-Grad, again using a concrete frame with brick walls - only the central wooden pillar is original. The house belongs to the sons of D. Bijedic, who now use it as a weekend retreat. The last third of the Biscevica House will be given to Stari-Grad on the present owners death, to be repaired and turned into a Museum.

Tannery "Taphane" was originally built in the 16th century as the military barracks for Ottoman troops guarding the bridge. It was turned into a tannery in the 17th century. It is a quadrangle with rooms on all four sides, some facing into the central courtyard while others face out onto the river. The riverine half of the building was in a totally ruined state, only the wall stumps were left; it had to be completely rebuilt. This was done using a reinforced concrete frame with walls made of "teneliya", river pebbles; the interior walls were made of bricks. The embankment under the tannery had been so undermined by the action of the Neretva that it had great, cavern-like spaces in it,

and these had to be filled and strengthened. The interiors will be finished in the traditional manner with lime plaster and wooden floors. Most of the roof slates are original, and are being reused. The other half of the quadrangle is still standing and is in use as a tannery; this will require some repair and the roof will have to be redone. The riverine half will be used as a traditional restaurant and the summer theatre festival will have their new home there. When complete, the other half will also house galleries, shops, leather workers and the tannery.

Time span : Work began in 1982, riverine half completed in 1986, second half by 1987.

Costs : US$ 540 per sq.m., area 1760 sq.m., Total cost: US$ 950,400.

IX. Future Projects

Work is expanding for Stari-Grad, although their major works are still within the zoned, core area of the old town: the exceptions are the mahallas or the private residential districts which are outside. During the next four year period, 1986-1990, Stari-Grad intend to complete the following restorations :

Tower "Hallabiyah", completed in the year 1676, on the right bank of the river. It will be restored as ateliers for artists.

Hadzi Mehmed Karadzoz Beg Mosque, the interiors have to be repaired, as does the minaret. The estimates and computer analysis of the parts to be restored are being compiled now. The budget for this project has been supplied jointly by the Republic of Herzogovina and the Islamic Community in Mostar and they have been given 18,000 US$ to begin with. The total costs will be much more.

Nesuh-Aga Vucjakovica Mosque was built in 1528/29 and is the oldest existing mosque in Mostar today. The lead of the roof has to be replaced and the interior repaired.

Koski Mehmed Pasha Mosque, whose roof and interior needs repair. The wall paintings in the interior will also be cleaned and restored.

Hammam Ceyvan Beg was built in 1626, and is the earliest hammam in Europe. The domes and walls need repair, and the interior needs to be restored so that it can function again as a hammam.

Ceyvan Cehajina Mosque, built between 1552-1558, and restored during the Austrian period in 1895, was turned into the Mostar Historical Museum in the early 1970's. The dome and the interior need repair, water seepage is damaging the walls.

Other projects include repairing and restoring four water mills, 17 shops on the right bank from the Austrian period (19th. century), numerous houses and designing the urban renovation of Marshall Tito Street, the main street in Mostar.

X. Technical Assessment

The work is of a generally high standard, the finish is good, and all materials used are of good quality. The fact that traditional building materials are easily available helps in keeping up the general level of restoration. There are no visible signs of ageing in any of the buildings, nor are there any apparent problems with the restorations.

Maintenance is kept up and all the buildings are clean and well looked after; all facilities function properly. If anything goes wrong, it is quickly attended to. There were no signs of leakage, even though it rained heavily for two days while we were there.

XI. Users

The main users and social beneficiaries of this project are the town's people, and the tourists who travel to Mostar every summer; both parties seem very satisfied with the end results. Stari-Grad are planning to poll the tourists this summer for their opinions and suggestions, and as the community of Mostar participates in the decision-making process, they can always voice their opinions. The fact that more communities in Mostar want to be included in

Stari-Grad's zoned area is a clear indication of the town's approval; after all, it can only improve their image.

XII. Aesthetic Assessment

The many and varied aspects of this restoration project, with different building types, from private houses to public mosques, have been handled very well. All the restorations fit well into the general atmosphere of the old town and the homogenous look is not disturbed; nothing is overdone, cute, or touristic. The re-use of old buildings is sensitively done, especially where mosques are concerned, and whenever possible the building is used for its original purpose. The overall impression is excellent and fitting.

Technical Reviewer : Selma Al-Radi

28 March 1986

LIST OF BUILDINGS

I. Restorations/Renovations	Re-use
"Stari Most", old bridge	--
"Tara", tower (left bank)	ateliers/studios
Hadzi Mehmed Karadzoz Beg Mosque (roof)	original usage
Hadzi Mehmed Karadzoz Beg Madrasah (roof)	" "
"Sahat Kula", clock tower, steps, gardens	" "
Roznamedzi Ibrahim Effendijina Mosque	exhibition gallery
Street of shops (left bank), 32 shops "kujundziluk-Stara Carsija"	crafts, shops,artisans restaurants, offices
Water mills (right bank)	restaurant
Private houses, Kajtazova, Biscevica	Turkish House Museum private residence

II. Major Re-buildings	
Koski Mehmed Pasha Madrasah and embankments	Tourist Bureau,atelier
Street of shops, "Prijecka Carsija" (right bank)	shops, crafts, artisans, restaurants, gallery
Houses, Bijedic, Biscevica	Museum, private house
"Taphana" tannery (in process)	Theatre, restaurant, ateliers, tannery

III. Future Projects		Year
Tower "Hallabiyah (right bank)	Ateliers	1986
Hadzi Mehmed Karadzoz Beg Mosque (int.)	original use	1986
Nesuh-Aga Vucjakovica Mosque (interiors)	" "	1986
Koski Mehmed Pasha Mosque (roof,interiors)	" "	1986-1990
Hammam, Ceyvan Beg	" "	1986-1990
Ceyvan Cehajina Mosque (roof,interiors)	museum	
Seventeen shops		1986-1990
Numerous houses		1986-1990
Marshall Tito Street (urban design)		1986-1990