

## DOCUMENTING THE PANAMA CANAL an International Achievement

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### KEY WORDS:

### ABSTRACT:

The Panama Canal Documentation Project was launched through a tripartite organization – ACP, HABS/HAER/HALS and ICOMOS- on March of 2001, between the countries of Panama and the United States, to document in interpretive drawings, large-format photographs and a data base the history of the construction of the Panama Canal and its mechanical operation, providing future generations with a fully understanding of a colossal achievement of the engineering of the 20th century. The international perspective through which the Panama Canal Documentation Project was conducted illustrates how two countries were challenged into organizing, locating, keeping and retrieving information of a now Panamanian enterprise that was constructed by the United States. The two nations archival infrastructure expanded frontiers as so will do the new set of drawings with its recording methods and techniques achieved through digital retrieval. The link with both ICOMOS organizations also accomplished the other part of the documentation goal, through providing training and exchange of expertise in recording and documenting techniques, assuring the strong liaison that the academic dimension of the project put into *documentation* as a tool for historic preservation activities. Involving personnel from both countries to work jointly assured the new documentation to be shared equally and produced bilingually. 75 sheets with interpretive drawings, a data base and a huge image bank will be the deliverables of the project, to be found at several ACP offices and the Miraflores Visitors Center in Panama and at the Library of Congress, the HABS/HAER/HALS Division of the NPS, the National Archives and the Panama Canal Museum in Florida in the United States, both in hard copies as on electronic version through the corresponding organizations web sites.

This is an extraordinary opportunity to talk about the PANAMA CANAL DOCUMENTATION PROJECT and the successful-international alliance between the Panama Canal Authority, the Panama and the United States ICOMOS committees, and the HABS/HAER/HALS Division of the National Park Service, US Department of the Interior.

### Project background

In early 1999 US/ICOMOS was approached by the HABS/HAER/HALS Division of the National Park Service, US Department of the Interior, to explore avenues of international cooperation to prepare **interpretive documentation** of the work done by the United States in constructing the Panama Canal at the beginning of the 20th Century. This work would be included in the HABS/HAER/HALS collection and archived at the Library of Congress.

### HISTORY

Let me start by presenting a brief history of the geographical location we are going to be speaking of and a short introduction of the organizations involved in the operation:

The Panama Canal is the realization of an idea four centuries old. It dates almost from the discovery of

Using a cooperative agreement with US/ICOMOS, and in turn, the link between US/ICOMOS and ICOMOS Panama, HABS/HAER proposed a joint initiative to achieve its documentation goal. US/ICOMOS felt that this would be a good opportunity to expand its objective of international cooperation and exchanges by using such a project to provide training to Panamanian conservationists in recording and documentation techniques.

A first trip to Panama by the Executive Director of US/ICOMOS and the Manager of HABS/HAER/HALS, on the 20<sup>th</sup> July 2000, gave birth to the initiative. In March 2001, a project manager was assigned to the project.

America by Columbus. The native Indians knew of a narrow place between the two seas and Balboa, a Spaniard was the first white man to cross the Isthmus. He began his expedition and reached the waters of the Pacific (south sea) in 1513.

With the passing of Spanish colonial domination, the United States took an official interest in the subject of a transportation connection between the two oceans;

by 1846 the principle of a canal for all nations was embodied by the United States as the most prominent maritime nation of the Americas.

A first step was taken in 1855 with the construction of the ocean-to-ocean railroad, and secondly in 1881, when a sea level canal got started by the world's chief canal-builder, Ferdinand De Lesseps. After four years the French Canal Company was in serious financial trouble, not just because of all the bad management, but also owing to the yellow fever and the imperative decision to turn the original sea-level design to a lock canal plan. In November 1903, immediately after the separation from Colombia, the negotiation of a treaty between the USA and the Republic of Panama was begun at once by secretary Hay and Bunau-Varilla, the Panamanian council, and was completed and signed by them in Washington on Nov18. Under its provisions the United States guaranteed the independence of the Republic of Panama and, in return for the payment of \$10 million dollars made on the date of the exchange of ratifications, and for an annual payment of \$250,000 beginning nine years after that date, the Republic of Panama granted in perpetuity to the USA a strip of territory ten miles wide and extending three marine miles into the sea at either terminal.

The President of the United States was directly in charge of the whole operation through Isthmian Canal Commissions and, during 96 years, many Divisions and Departments were established to carry out the construction and governance of the Canal Zone. Locally (in Panama) and overseas (in Washington, DC) various offices were established under several names: the Isthmian Canal Commission, the Panama Canal, the Panama Canal Company, and the Panama Canal Commission.

#### **AUTHORITY OF THE PANAMA CANAL, ACP**

Today, the Authority of the Panama Canal is the autonomous agency of the Government of Panama in charge of managing, operating and maintaining the Panama Canal. This was the result of the CARTER-TORRIJOS Treaty of 1977 which gave the Panamanians full responsibility for the Canal at noon, eastern-time, December 31, 1999.

#### **HABS/HAER/HALS**

The Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscape Survey (HABS/HAER/HALS) is an integral component of the federal government's commitment to historic preservation. The program documents important cultural sites throughout the

United States and its territories. It was established in 1933 as a program within the National Park Service and in 1934 an agreement between the Library of Congress and the American Institute of Architects was signed.

Complete sets of HABS/HAER/HALS documentation consist of measured drawings, large-format photographs and written histories, interpreting through its built environment America's diverse ethnic and cultural heritage. To insure that such evidence is not lost to future generations, the HABS/HAER/HALS collections are archived at the Library of Congress, where they are made available to the public as reference materials or they can be accessed on-line.

#### **US/ICOMOS**

The U.S. National Committee of the International Council on Monuments and Sites (US/ICOMOS) runs an International Summer Intern Program created in 1984. To date, 413 young professionals in historic preservation from the U.S. and 52 other countries have completed internships under this exchange program, fostering heritage conservation and historic preservation at the national and international levels through education and training and international exchange of people and information.

#### **THE PROJECT**

The *purpose* of the project was to produce a new set of information that would interpret the physical configuration of the canal's construction as built at the beginning of the twentieth century, and become an essential tool for the conservation of the mechanical-engineering systems, several of which have already been replaced by new technology. We were aware that this process would include tangible as well as intangible evidence, which contributed to the main objective: the creation of a documentation that would form an understanding of this engineering heritage and its related values.

The *strategy* of this documentation process was to be merely INTERPRETIVE; we were completely aware that construction drawings do not communicate in a language that people in general are trained to understand, and part of our goal was to help people understand. As Paul H. Risk, of Yale University, defines interpretation "the translation of the technical or unfamiliar language of the environment into a lay language, with no loss in accuracy, in order to create and enhance sensitivity, awareness, understanding, appreciation and commitment. For Risk, "the goal of interpretation is a change in behavior of those whom we interpret".

*As information providers, we were to do the following activities:*

**Heritage Recording**--capturing information relevant to understanding the physical configuration, evolution and condition of the Canal's site and structures at an exact period of time --1904-1914--.

**Documentation**--the production of new information units, drawings, photographs and written report, that would constitute new interpretive knowledge of this particular site and structure.

**Information management**--the process of acquiring, storing, and sharing the site's documentation to ensure its accessibility, security and reliability through a database.

**Conservation**--through new documentation we would globally transmit a cultural heritage with its significant messages intact to the greatest degree possible.

A *personnel strategy* was formed at the Washington office and, through the US/ICOMOS Summer Intern Program, Panamanians were to come and make part of the team. The *operation's* plan of a project to record a resource as vast as the Panama Canal required an international approach.

*Documentation procedures* were to follow the National Park Service Secretary of the Interior's Standards, necessary with both Panamanians and North American personnel working together at different sites. Final bilingual drawings would be housed at the Library of Congress of the USA and in the Republic of Panama, supported by the agreement for sharing of information and the exchange of expertise and training. Interpretive drawings; large-format photographs; field records, and a database will be the final deliverables of the project.

### **Operation**

The Panama Canal documentation Project started on June 2002 through the internship summer program, hiring a young architect from Panama for producing CAD drawings of the Pedro Miguel Locks in the Washington office and a USA student to work in Panama on the Administration Building. Besides these two young professionals, the project included two architectural students; a Colombian architect who worked on the database and a Vietnamese/American to do the hand-drawn sheets. Before beginning the summer program, large-format photography took place in July 2001, photographically documenting the twenty-first century technological changes.

Getting started in Washington, access to virtual drawings was our immediate choice, because of the distance, size and complexity of the Canal. Although the approach was to use digital data, several visits to the site were required in order to develop the familiarity needed for recording this complex

structure, which besides encouraging an active engagement, it would build a unique liaison between the surveyor and the construction. The act of gathering data, organizing it and translating it into 3D drawings, required intellectual, emotional and interpretive skills that were distributed well. Each one of the team members established a relationship to the others within their goal and I am proud to present to you what has been achieved.

At the beginning of the project, the situation with the existing-engineering drawings was the following:

Back in 1994, the Records Management Branch of the Panama Canal Commission (PCC) requested an on-site scheduling assistance from the National Archives and Records Administration (NARA) regarding the architectural and engineering drawings accumulated at the PCC's Engineering and Construction Bureau in Panama. Permanent disposition of the entire collection was scheduled to take place immediately after microfilming. A hard copy was to be left with the Panamanian administration. But in 1997 a new agreement took place and instead of transferring the original drawings to the United States, a microfilm hardcopy was accepted.

The entire collection, dating from 1899 to the present, was grouped by a numbered series running from 1 to 70 according to dates and kept entirely in Panama under the custody of the Central Archives Office of the Authority of the Panama Canal (ACP) in the drawing vault of the Engineering Division at Diablo Heights. Today new headquarters are being restored at Corozal Oeste, where the entire collection will be housed under very good conservation conditions.

A visit on May 2001 to the office of Information Technology of the Engineering Division at APC informed us about a digital project that took place by direct order of the Department of Defense, from June 1998 through December 1999, when the drawings were scanned and an Access database was provide for its retrieval. In accordance with the agreement, the scanned images were subsequently to be transposed to a computer-output microfilm and be sent to NARA. NARA received one silver halide and one diazo copy in October 2001.

In 1995, the Environmental Resources Planning Section and the Planning and Environmental Division of the Mobile District Corps of Engineers for the Panama Canal Treaty Agency conducted a baseline historic resource assessment of the historic lands and facilities located within the Panama Canal Zone. Prior to the survey, a team was sent to gather the archival records and transferred them successfully to NARA.

Having identified and located the documents--the architectural and the engineering drawings, the textual records, the photographic albums--of the former Panama Canal Zone at the National Archives and Library of Congress in the United States, and in the

Republic of Panama as well, the second step of the project was ready to start. This was the signing of the cooperative agreement between organizations and pertinent entities that were interested in documenting the engineering, architectural and cultural aspects of the Canal.

Knowing we had no hard copy of engineering drawings in the United States, the PANAMA CANAL DOCUMENTATION PROJECT had to approach the mission of recording a historic structure that was distant, and in another country, through obtaining construction drawings, as it would have involved many difficulties to have conducted the documentation through field measurements. The VIRTUAL APPROACH was decided.

Next, another decision came into place: the period to document. The dates selected were 1904 to 1914 that included the planning, the sanitary and the construction periods of the Isthmian Canal Commissions. We needed to locate and obtain the digital images of these drawings, within the vast amount of information (3,000 sq ft of drawings +/- 200,000 digital entries).

A selection of 30,000 scanned drawings, within a total of 200,000 was copied to 37 CDs. But when manipulating the scanned information at the Washington office it was hard to access as it was arranged numerically and there was no subject reference for its retrieval. An exhaustive research at the ACP led us to finding the Isthmian Canal Commission's LOG BOOK which became the key to the following processes of the Documentation Project.

In order to understand what I just said, you must understand that the actual work of the Panama Canal began before it had been finally decided whether the sea-level, or lock, type of canal would be adopted. Much of the organization had been set in place before Congress ordered that a lock canal be built. In the later part of 1906, a designing force was organized, under the Principal Assistant Engineer in the Washington Office of the Isthmian Canal Commission. This force presented studies for the lock masonry, the gates and the emergency dams. A group went to the Isthmus of Panama after the reorganization of the work in the spring of 1907, and continued there developing the studies for the masonry. However, the studies for the lock gates and emergency dams were continued in Washington. In July 1908, the designing of the locks, dams and regulating works was consolidated and the part of the force then in Washington was brought to the Isthmus, and remained there until disbanded upon completion of its work.

Finally, in 1908 the office force of the Assistant Chief Engineer, engaged upon the designs was organized in 1908 into six subdivisions as follows:

MASONRY and LOCKS, including VALVES  
LOCK GATES

OPERATING MACHINERY and ELECTRIC  
INSTALLATIONS  
EMERGENCY DAMS  
SPILLWAYS  
AIDS TO NAVIGATION

Cooperation among these subdivisions was essential as the designs and plans prepared by each were more or less affected by those of others; the plans as a whole had to be in agreement, to avoid errors in construction. Thus, the tracings originating in one subdivision were submitted for review to every other subdivision whose plans might be affected, and there, such affected portions were checked and the tracings signed by those in charge. Subsequent alterations or additions to plans had to be conspicuously reviewed and the revised tracing dated and initialed by all concerned. A record was kept of all blueprints sent to the construction divisions, together with the acknowledgment of their receipt, and this is the LOG BOOK that we found.

With the scanned digital drawings, the Log Book and a reference library of 199 books acquired under a long-term lease from the Panama Canal Commission's Washington office, six main subjects were selected to approach the fifty-mile / 80 Kilometers waterway connecting the Atlantic and Pacific oceans. As originally designed it was composed of three pair of locks—Miraflores, Pedro Miguel and Gatun—one dam, Gatun, and two lakes—Gatun and Miraflores, two port facilities and a Railroad mainly. Later, in the mid-20th century, the Bridge of the Americas that spans the Canal, Madden Dam, and other improvements were added. These aspects of the Canal are to be recorded by the *Historic American Engineering Record* ~ **HAER**.

Singular buildings within the Canal Zone, like the Administration Building at Balboa, the house of the Administrator of the Canal, the Hospitals at Colon and Panama City, the lock control houses, the lighthouses, the railroad terminals, etc. will be documented through the *Historic American Buildings Survey* ~ **HABS**, being all fine examples of 20<sup>th</sup>-century tropical architecture.

The five U.S. community sites, the six forts, two air force bases and the facilities of a single naval station that were turned over to the Panamanian government on December 31, 1999, with the property transfer and as part of the privatization process, typical changes in the urban and architectural character of the Canal are occurring, necessitating the need for documentation of these early twentieth century landscapes as part of the *Historic American Landscapes Survey* ~ **HALS**.

## DELIVERABLES OF THE PROJECT

Two main deliverables –the database and the drawings-, as also a huge electronic image bank and

65 large format photographs constitutes the final product of the Project. All of them can be found at the US Library of Congress, HABS/HAER/HALS Division of the NPS, the National Archives –NARA, the Panama Canal Museum in Tampa, Florida as in Panama at the Authority of the Panama Canal offices and at the new Miraflores Visitors Center.

### The Database

A new Isthmian Canal Commission database will run on File Maker Pro software, through the HABS/HAER/HALS Information System. Three categories were set up to identify the ICC drawings:

1. The drawings registered in the Log Book
2. The drawings not registered in the Log Book, but under the name of the ICC
3. The drawings done by contractors

The web interface with the database of HABS/HAER/HALS, the US National Archives and the Authority of the Panama Canal, will allow users to browse more than 6,500 entries regarding the Panama Canal by subject, location and general keyword searches; digital images from the available scanned and interpretive drawings, large format photographs and written historical and descriptive data from the project will also be attached at agreed locations.

### The Drawings

A total of 75 drawings were produced, on 24"x36" Mylar:

- **Raster drawings/** in order to holistically illustrate the history of the Panama Canal, graphic drawings were done under the HAER format.
- **Vector drawings/**  
\*3-D: scanned drawings were pulled from the database and CAD drawings were

created through AutoCAD, version 2002, scaling the "object" 1:1. A library was built of the masonry and machinery of the lock, all drawn and edited to an agreed level of detail. A three-dimension illustration was the final result, which in turn was used for animation –museographic purposes.

\*2-D: two-dimension final drawings illustrate the Canal using feet and inches. Although the drawings are done in both Spanish and English on the same sheet, it was decided to do the drawing itself in the English measurement since it was the system used for its construction. Nevertheless, both imperial and metric data will be provided on the drawing sheets, besides a graphic scale.

- **Free-hand drawing/** was used as needed to fill in areas not otherwise digitally recorded.

To end this presentation, I would like to summarize in three statements what I believe were the most relevant achievements of the Project:

1. The success of the alliance between the tripartite organization. The team was able to build upon different identities, ethnic differences and with the multiple and varied conditions that were part of working abroad, especially when looking at this Project from the political scope of the recently reverted Canal. In doing so we become advocates of the tripartite relationship that surely contributed to a worldly documentation's interest, involving these two countries in a new partnership through the ICOMOS committees.

2. Without any question, the Documentation Project planted a seed: it projected historic preservation concerns into interdisciplinary and inter-institutional Panamanian programs, which eventually will spring forth at their own timing, under the pressures from new and old participants.

3. And finally, the real impact: assuring to future generations the comprehension of the design and operation of the Canal, **promoting the permanence of its memory through information.**

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