

## FIELD TRIP FOR RECORDING HISTORIC BUILDINGS: PRACTICE IN DOCUMENTATION TRAINING IN TIANJIN UNIVERSITY, CHINA

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### ABSTRACT:

In China, good architectural schools still keep the tradition of taking the practice of measuring and recording historic buildings as part or extension of their architectural education, as well as a way of education on heritage conservation through participating in historic building recording. The early recording activities undertaken by college students were carried out in 1940's in the architectural department of Hautes Etudes Industrielles et Commerciales (Institute of industry and commerce), Tianjin, one of the predecessor of School of Architecture, Tianjin University. In early 1950's, with the reorganization of a new architectural department, the "Field Trip for Recording Historic Buildings" became a regular course / module for undergraduate program with some connection to the Beaux's tradition. Since then, the brilliant tradition has been kept, improved and enhanced so well that the compulsory course for the second-year students became a "China Quality Course" entitled by Ministry of Education. Further more, based on the achievements and data, which have become part of national or local heritage archives, a series of related researches, conservation plans and restoration projects for the heritage sites, most of which are world heritage or national heritage level, have been finished so successfully as to result in the establishment the "Key Scientific Research Base of Historic Building Survey and Recording (Tianjin University), State Administration for Cultural Heritage". This paper gives a brief introduction of the field trip as a comprehensive, practical module in the five-year program, including the history, background, guidelines, operation mechanism, organization structure, projects, textbook (first of this kind in China), courseware, website, computer games, technique application and development. It also covers its special, comprehensive benefit effects, especially the teaching reforms since the end of 1990's, hoping to share our experience of documentation training with the colleagues throughout the world.

### 1. BACKGROUND

Coincidentally and sarcastically, China's English name sounds like a Chinese word "*chai*", that means "to demolish", or "demolition." It is the case that the boosting of China's economy has been leading to too much unnecessary demolition of old buildings, particularly in some extreme cases even valuable historic buildings were seriously destroyed.

However, have you thought of it? Of all these cases, which one could be carried out without signatures of urban planners or architects? What kind of roles do they play? Who has the responsibility to give the information of the right ideas of heritage conservation?

Although they are not decision-makers, It is strongly believed that well informed planners and designers will be of great help for proper treatment of cultural heritage.

Students in our architectural schools are future architects and urban planners. So the question is:

How can we exert positive influence upon students in the field of heritage conservation? How can we help students to get the right ideas on heritage conservation?

In addition to regular course and lectures for conservation principles, we found out, with decades of teaching experience, that Field Trips for Recording Historic Buildings may be an effective way to attain part of the solutions.

Through participating in building recording projects, the students involved will get an experience deeply engraved on their mind and make further understanding of historic buildings by developing an "intimate" relationship with heritage itself and conducting a "dialogue" with masterpieces and their creators. Finally, it may attract some students to join some future conservation work.

### 2. HISTORY

As the first modern university in China, Tianjin University (TJU), called Peiyang University before 1951, was founded in 1895. Since then, metric survey as part of civil engineering education has been taught for more than a century (fig. 1). Actually, the well-known Wuhan University of Survey and Mapping (merged into Wuhan University in 2000) were created by the staff members from TJU and other universities in 1956.



Figure 1. Old photo of Peiyang (Tianjin) Univ. (1903), showing the main building on the background and a group of students using metric survey instrument in the foreground.

As far as historic building survey is concerned, almost everyone in China knows about LIANG Sicheng, LIU Dunzhen and their Society for Research in Chinese Architecture. In 1930s, they discovered, visited and surveyed hundreds of historic buildings and sites. So, Liang and Liu are regarded as the founders of study of history of Chinese architecture.

However, almost ten years prior to this, in 1920, a young architect called SHEN Liyuan (or Seng Liyuen), who just graduated from an Italian university in Milan, finished the earliest known measured drawing of historic Chinese buildings prepared with modern method (Shen 2002). And 17 years later, he became a professor of Hautes Etudes Industrielles et Commerciales (HEIC, Institute of Industry and Commerce) and was appointed as the Dean of the Department of Architecture, which is one of the predecessors of the School of Architecture, Tianjin University.

During his tenure, from 1941 to 1944, students and teachers from the Department, led by Prof. Zhang Bo, participated in a great project aiming at the measurement and recording of the historic monuments in Beiping (currently Beijing), including the main halls and gates of the Forbidden City and other key buildings along the main axis of Beijing (fig. 2) (Wen 2002). It is regarded as the beginning of our Field Trips.



Figure 2. Measured drawing by HEIC (1941-1944)

In 1952, during the nationwide restructuring of institutions of higher education, a new Department of Architecture reorganised based on the ones from HEIC and others. “Field Trip for Recording Historic Buildings” formally became a compulsory course in undergraduate program. It was after the system of former Soviet Union’s architectural education with some connection to the Beaux’s tradition of France. Simultaneously, the same things also happened to other universities, such as Tsinghua University, Nanjing Institute of Technology, Tongji University, etc.



Figure 3. Our footmarks: heritage sites covered by TJU from 1952—2008

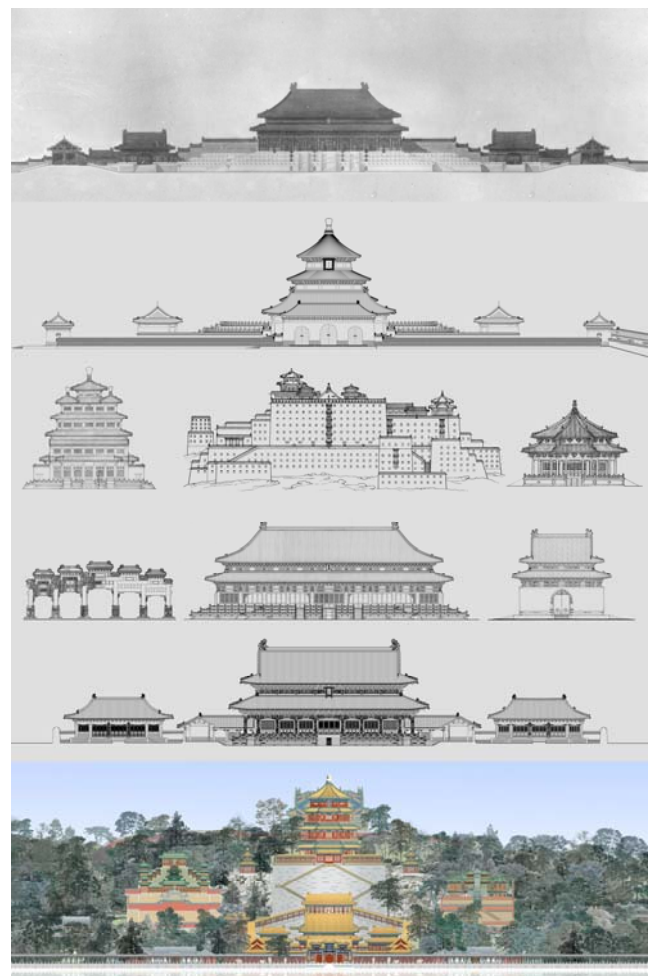


Figure 4. Measured drawings of some World Heritage sites: the Forbidden City, Temple of Heaven, Mountain Resort and its Outlying Temples, Temple of Confucius, the Summer Palace.

During the past decades, we have covered over a hundred large-scale groups of historic buildings in more than 20 provinces, including seven World Heritage sites, and most the rest are official protected heritage sites of national level (fig. 4).

The Field Trip survived difficult days including decade of interruption during “Cultural Revolution” (1966—1976) and the years around 1990, when limited budget, lack of passionate

and qualified teachers and poor technical condition almost made it come to an end.

However, the teaching reform from early 1990s re-vitalized the course and the brilliant tradition has been kept, improved and enhanced so well that it became a “China Quality Course” entitled by Ministry of Education (2007). Further more, based on the achievements and the accumulated data, which have become part of national or local heritage archives, a series of related research, conservation and restoration projects have been completed so successfully as to result in the establishment the “Key Scientific Research Base of Historic Building Survey and Recording (Tianjin University), State Administration for Cultural Heritage” (2008).

### 3. PROFILE

#### 3.1 Significant and Goals

Field Trip for Recording Historic Buildings, a compulsory course for second-year students, is a comprehensive, practical module in the five-year undergraduate program of School of Architecture, Tianjin University. It provides the students involved with opportunities:

- ♦ to get perceptual knowledge about historic buildings through the “dialogue” with the masterpieces of ancient monuments;
- ♦ to utilize and improve the knowledge and skills learned from the first two years through practical tasks;
- ♦ learn more about architectural history as an extension of “History of Chinese Architecture” course;
- ♦ get conservation training through heritage documentation;
- ♦ receive moral education (patriotism, team work, strictness, hardworking etc).

#### 3.2 Time, Venues, and Participants

**3.2.1 Time:** The Field Trip is held in every summer vacation (July to August), including more than 25 days of on-site and off-site hard work.

**3.2.2 Venues:** Venues are varied according to specific recording projects. Large scale historic building complex or heritage sites of national level are preferred.

**3.2.3 Participants:** around 150 second-year undergraduate students, more than 20 postgraduates and/or senior undergraduates (severed as teaching assistants), and five teachers.

#### 3.3 Reforms

In early 1990s, the teaching staff carried out a series of reforms. It was so successful that we not only overcame the difficulties mentioned above, but also led great-leap-forward development in measurement and recording activities.

**3.3.1 Re-orientated and Re-organized:** Instead of keeping the course as a mere teaching activity, the teaching staff made a great change for the goals: to meet the needs of conservation activities and become integrated into the system of conservation, including practice, training and organization.

Correspondingly, the teacher-student organization became a three-level structure, with teachers on the top, postgraduates/senior students in the middle, and undergraduates on the bottom. Postgraduates/senior students play double-roles: teaching and studying. So the whole structure becomes a cross-disciplined, multi-levelled, one-task-and-multi-solution system.

**3.3.2 Series of Transitions:** there are many specific changes and transitions in the teaching activities. The examples are showed in the table 1.

From focusing on (before)	To (after)
Presentation concern	Technique concern
Perceiving and experiencing	Exploring and discovering
Presentation skill mainly	Theoretic thinking included
Simplex professional training	Comprehensive cultivation

Table 1. Changes before and after the reforms

#### 3.4 Techniques Applied

Hand measurement with instrumental survey control is generally applied in the field trips, but for special subjects and needs, all techniques available and appropriate are exploited. CAD are used as a main measure for 2D line art drawings. For latest decade, new technologies were constantly introduced to keep up with the international development:

- ♦ Before 1998: conventional instruments
- ♦ 1998: CAD (fig. 5)and EDM
- ♦ 2004: mini UAV for aerial photography and photogrammetry (fig. 8)
- ♦ 2005: GPS
- ♦ 2006: 3D laser scanning (fig.6)
- ♦ 2007: digital close-range photogrammetry (fig. 7)

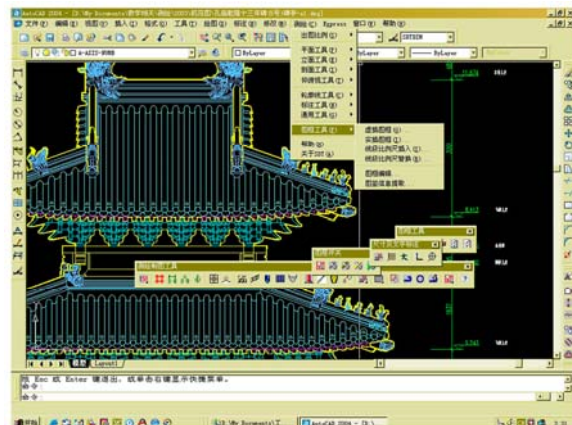


Figure 5. CAD software base on AutoCAD





Figure 6. 3D laser scanning



Figure 7. digital close-range photogrammetry



Figure 8 mini-UAV and photographs

### 3.5 Textbook, Website, Courseware, and Game

In order to make the training progress more and standardized and systematic, and for better quality control, we edited and published *Measurement of Historic Buildings* (*Gu Jianzhu Cehui*, fig. 9) the first formal textbook of this kind in China (Wang 2006). In addition, we took all kinds of digital measures to attract students to get involved in the recording activities, including building a website (<http://202.113.13.85/zggjzch/new/>) (fig. 11), developing a series of CAI courseware (fig. 10) and a special “find difference game” (fig. 12).



Figure 9. The textbook



Figure 10. The CAI courseware



Figure 11. the website for the course

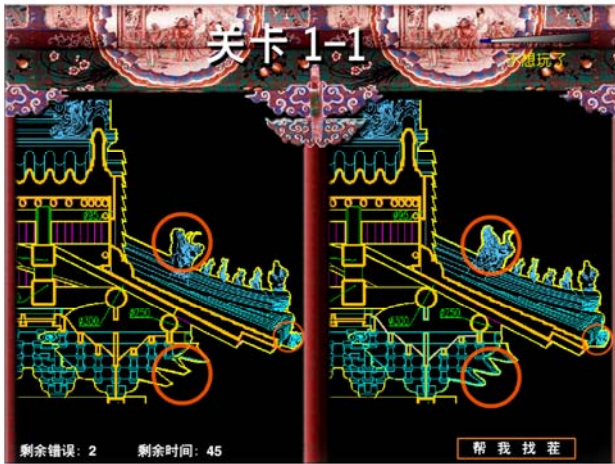


Figure 12. Computer game

#### 4. PROSPECT

As mentioned above, the field trip nowadays is not merely a teaching process, but becomes a comprehensive practical action, in which the products by second-year students can be directly used for further conservation activities. In recent decade, the accumulated data attained by the field trips were widely used in important research projects afterwards, conservation master plans, and restoration projects for the heritage sites concerned, such as master plan for conservation of Summer Palace, nomination of World Heritage site the Imperial Tombs of Ming and Qing Dynasty, and the research projects for Yangshi Lei architectural Archives (listed in UNESCO's "Memory of World" ), restoration project for Angkor Monuments in Cambodia (fig. 13) and so on. Therefore, by cooperating with cultural heritage authorities and getting integrated into the conservation system, we thus create a virtuous circle, in which teaching, research and social practice are well organized, and there forms a win-win situation between the university and administrations of cultural heritage. This was so successful that the "Key Scientific Research Base of Historic Building Survey and Recording (Tianjin University), State Administration for Cultural Heritage" were approved by the China State Administration for Cultural Heritage. It goes without saying that in this framework – "Research Base" and "Quality Course", the future of the recording activities will be better and better and hence the related research, assessment, conservation plan, and restoration design will be enhanced and improved.



Figure 13. As-bulit survey of Chau Say Tevoda, Angkor Monuments, Cambodia (after restoration)

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