

# 共同的遗产

上海现代建筑设计集团历史建筑保护工程实录  
Historical Building Conservation in Shanghai



上海现代建筑设计（集团）有限公司 编

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# 序一 | 张桦

2009年5月的一天，拿到《共同的遗产——上海现代建筑设计集团历史建筑保护工程实录》一书的样稿，迫不及待地从头到尾翻了一遍，一种感慨和感动油然而起，强烈感受到集团近60年的历史积淀的深厚。历年来，集团及集团前身两院先后承接了近百项历史建筑保护、修缮、改建的设计任务，这些项目建筑风格各异，有代表上海近代建筑历史的西洋风格的经典之作，有典型中国江南传统建筑形式精品，还有贯融中西文化的海派建筑。这些精彩纷呈的建筑都是上海这座远东城市建筑“博览馆”的镇馆之宝。上海现代建筑设计集团几代技术人员为保护和维护好这笔珍贵的历史遗产，做出了重大贡献，正是有了他们这种严谨、一丝不苟的工作作风，才能使我们后代得以继续目睹这些历史建筑的光辉，穿行于历史建筑之间，感悟历史，获得熏陶。

上海现代建筑设计集团拥有光辉灿烂的60年的历史，完成了数万个不同规模的设计项目。几十年来，从两院的档案室到现在的集团档案室，承担大量的文字、图纸和照片等建筑档案的保管工作，在档案

中，不乏大量珍贵的、具有历史和学术价值的文献资料。在广大国民对中国传统和历史兴趣日增、国民或国人意识日强的今天，我们精心挑选了影响力较大的20个项目，将项目的图纸、背景资料和设计人员介绍整理后，结集出版，以满足建筑历史学科研究者和广大读者的要求。

上海现代建筑设计集团历史建筑保护技术研究学科中心承担了大量具体的工作，用了近两年时间才得以完成，我由衷地向他们表示敬意和感谢。他们用实际行动来唤起社会对中国历史建筑文化的保护意识，进而推动上海历史建筑研究的发展，提高上海历史建筑学术研究水平。

让我们为光大上海历史建筑文化共同努力。



2009年5月21日



# PREFACE 1

| Zhang Hua

In May 2009, I got the proof of *The Common Legacy – Historical Building Conservation in Shanghai*. After looking the book through, I found myself fraught with emotion, closely approaching the profoundness of a 60-year history of Shanghai Xian Dai Architectural Design (Group) Co., Ltd. Over the years, the Group and its predecessor have completed almost a hundred projects of historical building conservation, restoration, and renovation. Buildings under the projects are distinguished from each other by styles: some are western-style masterpieces representative of modern Shanghai architecture; some have a typical traditional Chinese flavor; and some are mixtures of both western and Chinese culture. These outstanding buildings are all the top treasures of Shanghai – the "museum" of urban architecture in Far East. Generations of architects of Shanghai Xian Dai Architectural Design (Group) Co., Ltd. have made significant contributions to the preservation and protection of the precious heritage. Because of their meticulousness, we and our descendants are blessed to see the brilliant historical buildings, to gain historical insights and to be inspired while roaming among them.

Shanghai Xian Dai Architectural Design (Group) Co., Ltd. enjoys a history of 60 years and remarkable success, and has finished thousands of design projects with different scales. For decades, no matter in the archives of the two major institutes or in the archives of the Group, large

numbers of architectural documents including scripts, drawings and photographs are kept in good condition, most of which offer precious information with both historic and academic value. With the increasing civil interest and awareness in Chinese tradition and history, we carefully selected 20 most influential projects, and published this collection along with introductions on drawings, backdrops and designers, so as to satisfy the demands of researchers and readers.

Historical Building Conservation Technology Center of Shanghai Xian Dai Architectural Design (Group) Co., Ltd. has undertaken substantial work within two years to finish this book. I feel truly grateful and I have to express my respect to them. Their endeavor has aroused awareness to protect the culture of Chinese historical architecture, accordingly promoted development of such research, and raised academic research level.

Let us join in a common effort to promote the culture of Shanghai historical architecture.

*Zhang Hua*

May 21, 2009

## 序二 | 章明

当翻开这本《共同的遗产》时，深深的触发了我在半个世纪前原上海民用建筑设计院工作时的回忆。当时，在陈植老院长的主导下，对上海优秀历史建筑的保护工作十分重视，凡是院承担的各项历史保护建筑修缮工程，老院长都亲自指导，对每项历史建筑和名人故居的修缮设计总是组织有经验的老工程师或自己负责，并安排年轻的设计人员跟随前辈边学边做，对年轻一代的教育与成长起到积极的效果。

1950年代以来，上海建筑设计院所承担了许多历史建筑保护修缮项目都属于后来国家颁布的上海市第一批优秀历史建筑或文物保护单位。这些优秀历史建筑大都经历了沧桑和变化，解放后许多历史建筑曾被改变了原有的功能或在“文革”中遭到破坏，如上海基督教青年会大厦，曾被改为淮海饭店，使用单位保养和管理不善，内部严重破坏。交通银行原为金城银行，曾被改为上海青年宫，1986年恢复银行功能；基督教沐恩堂“文革”中停止宗教活动，教堂归上海市南京中学使用，1979年重归教堂；原汇丰银行1956年~1995年为上海市人民政府办公地，1996年恢复银行功能，进驻浦东发展银行等。由于使用功能的改变，建筑物的内部布局也会随之产生一些变更，因此在维护修缮复原时增加了难度。在资料不全的情况下，需要多方查找资料，现场测绘，反复研究推敲建筑复原的真实性和历史性。举个简单的例子，1980年恢复修缮徐家汇天主教堂在“文革”中被破坏的双塔尖顶时，在没有任何历史资料的情况下，仅凭教堂外景照片，设计小组通过访谈、制作模型，与照

片对比研究，绘制出尖顶高度复原式样，用钢架结构代替木柱结构，用铅板作防潮层，建筑师深入石材矿场选购材料，开劈规格200mm×400mm×5mm的青石板，材质与原意大利石板雷同。天主堂双尖塔修复至今已经30年，外形挺拔，比例完美，恢复了文物保护建筑的艺术价值。

1990年代开始，国家陆续颁布了文物保护法和优秀历史建筑保护法规等。上海城市的历史风貌保护和城市历史文脉的延续已得到各方面的重视，并认为历史风貌是上海城市的“要素”、“灵魂”。有关部门确立了保护原则，对优秀历史建筑的保护性修缮设计要尽可能恢复历史建筑原貌，使艺术价值和历史价值重现出来。

这次现代设计集团历史建筑保护技术研究学科中心组织力量把这些保存了半个世纪的优秀历史建筑保护性修缮工程的图纸、实物照片、文字说明以及近几年的保护性修缮项目一并整理成册，还增加了修缮评价说明。全书图文并茂，按工程的修缮时间顺序，用图册的方式展现出来与公众共享。这些历史成果不仅具有珍贵的艺术和科学价值，更重要的是希望在大规模的城市建设中，为保护好历史文化遗产与再利用、延续城市文脉提供一些参考。



2009年5月28日

## PREFACE 2 | Zhang Ming

Turning over the pages of *The Common Legacy*, my memory of the time when I was still in former Shanghai Municipal Institute of Civil Architectural Design was touched off. Back to five decades ago, under the leadership of former President Chen Zhi, great importance was attached to conservation upon heritage architecture in Shanghai. President Chen saw to every single conservation project that was carried out by the Institute; besides, he organized senior engineers and cultivated the young generation in earnest.

Ever since the 1950s, most buildings under the conservation projects undertaken by the Institute were then declared by the Outstanding Historical Buildings or Protected Cultural Relic Sites of Shanghai. But in the past decades, these buildings had undergone either changes in function after 1949 or damages during the Cultural Revolution. For instance, Shanghai YMCA Building was once changed into Huaihai Restaurant, and severely destroyed due to bad maintenance; the Bank of Communications, former Kincheng Bank, once served as Shanghai Youth Palace, and resumed banking function until 1986; since religious activities were cracked down during the Cultural Revolution, Mu-en Church was taken over by Shanghai Nanjing Middle School and given back to ecclesia in 1979; former HSBC building was used as Shanghai Municipal People's Government office from 1956 to 1995, and regained banking function and entered Shanghai Pudong Development Bank in 1996. In the wake of changes in function, interior layouts of the buildings were somewhat altered. That situation increased difficulty in preservation and restoration. Especially when there was no sufficient information, only after meticulous data collecting and detailed site survey can historical authenticity be nicely restored. In 1980, the two steeples of Xujiahui Cathedral, removed during the Cultural Revolution, were under restoration. In the absence of historical materials, the design team made out the drawings of the steeples based on a few photographs of exterior view. Interviews and models were made and

comparative research was carried out. As a result, steel truss was employed instead of timber column and blue leadings were adopted as waterproof layer. The architects went a long way into the stone fields picking out proper materials, blue stone, resembling the original Italian slates, and cut into 200mm×400mm×5mm slates. Almost 30 years have passed since the restoration project was finished. Its amazing appearance and perfectly organized proportion have brought back the artistic value of the heritage architecture.

Since the 1990s, the State has promulgated several laws, such as Law on the Protection of Cultural Relics and Legislation on the Protection of Excellent Historical Buildings. In that case, due attention has been paid to the protection of historic features and the continuation of urban context of Shanghai; further, the historic features have been esteemed as "the essence" or "the soul" of Shanghai. Related departments established conservation principles aiming to restore to the original to the full, and recapture artistic and historic value.

In editing *The Common Legacy*, Historical Building Conservation Technology Center of Shanghai Xian Dai Architectural Design (Group) Co., Ltd. managed to organize drawings, photographs and illustrations which have been conserved for over half a century, as well as documents of recent restoration projects, and a comment was attached in the end of each projects. The book is organized in the sequence of the projects with adequate pictures and texts, and shared with the public in the manner of graphic illustration. The precious outcome owns great artistic and scientific value. More importantly, it is expected to provide reference to better conserve and reuse historical and cultural heritage during the large-scale urban construction.

*Zhang Ming*

May 28, 2009



# 前言

唐玉恩、张皆正

建筑是历史文化的载体，承载着社会发展的印记，历史建筑是人类的物质文化遗产，各个时期的历史建筑反映着当时的社会政治、经济、技术、历史、文化、艺术特征及其价值观。历史建筑是不可再生的文化遗产，既会自然性物理老化，也会受到天灾人祸的破坏，保护、修缮历史建筑已成为城市传承历史的神圣职责。

上海现代建筑设计集团的子公司——华东建筑设计研究院有限公司与上海建筑设计研究院有限公司（分别成立于1952年与1953年）的历史建筑及保护等资料记载了几代设计师在历史建筑调查研究、保护修缮设计等方面的努力和业绩。

1950年代末，在上海市建设委员会领导下，集中上海市民用建筑设计院、华东工业设计院、同济大学等一些专业人员成立了上海建筑史编委会。当时编委会设在上海市民用建筑设计院，作了大量的调查研究，资料与照片也一直保存在那里。1988年由陈从周、章明主编，上海市民用建筑设计院编著的《上海近代建筑史稿》出版，弘扬上海地区丰厚的物质文化遗产——上海近代历史建筑，为上海历史建筑保护奠定了学术基础并产生了不可估量的作用。

2006年，上海现代建筑设计集团在筹建历史建筑保护技术研究学科中心时，回顾近60年来，涉及历史建筑保护的项目已近百项。其中大部分为全国重点文物保护单位、上海市文物保护单位或优秀历史建筑。一大批修缮设计图纸与相关历史档案保存在集团档案室里。

细读这些图纸资料使我们深受感动，自1950年代的手工铅笔绘图到近十年的电脑绘图，从120黑白胶卷照片到如今的彩色数码成像，在跨越半

个多世纪岁月里，承担修缮设计的建筑师们始终遵循着还原历史真实、修旧如故的原则，以传承历史、精益求精的精神，多方考证，尽可能使用历史材料和工艺等方法进行严谨、科学的设计，为上海保护珍贵的城市历史遗产尽力。这些设计资料不仅记录着历史建筑的修缮内容、技术、过程和问题，概要反映了1950年代以来上海保护、修缮优秀历史建筑的历程；其本身所涵盖的思想、技术、方法乃至精准的设计图等，也已成为极宝贵的历史遗产，具有相当的学术价值、历史价值，值得学习、传承。

我们从浩瀚的档案中精选了20个跨越50余年历史的修缮设计项目，有知名的外滩经典建筑、历史悠久的中国传统建筑、革命纪念建筑，也有宗教建筑及建成于1955年的上海最“年轻”的优秀历史建筑等。整理这些图纸资料，特别是1950~1980年代的设计，是我们向前辈建筑师学习的机会。

本书着重从历史沿革、修缮技术、设计要点及评价等方面整理编辑历史资料，并重描部分图纸，以保持应有的技术性和学术性。

这些项目原则上以当年委托设计时的名称命名，不合适者附注了原有名称。如第10项“青年会大厦”附注了（上海基督教青年会大厦）。

对于修缮设计的内容，无论“修缮”、“修复”或“室内装修”均确保建筑外观与室内重点部位的原真性，个别项目经充分调研考证、去伪存真地修复了早期历史面貌（真如寺）；部分项目因使用功能的变更作了局部调整或扩建。

本书保留当年承接设计单位原有名称。凡上海市建筑工程局生产技术处设计室、上海建筑设

计公司、上海市民用建筑设计院、上海市规划建筑设计院、上海建筑设计研究院均是上海建筑设计研究院有限公司的曾用名称。凡华东建筑工业部设计公司、华东工业设计院、华东建筑设计研究院均是华东建筑设计研究院有限公司的曾用名称。

书中主要设计人员为当时项目主要涉及的专业及设计人员。所有图注尺寸保持原注尺寸。

本书编辑过程中，选用不少历史档案中当年拍摄、今已泛黄的老照片，它们记载着修缮前后的历史真实。本书保留了1950年代前辈用铅笔手工绘制的龙华塔等图纸历史痕迹，图纸虽已发脆，却仍然优美清晰。历史档案中豫园工程几页小结草稿也反映了前辈对保护历史文化遗产的认真投入，可以说是一笔精神层面的财富。

唐玉恩 张皆正

2009年6月20日



# PROLOGUE | Tang Yuen, Zhang Jiezheng

Being a vehicle of historic culture, architecture witnesses the growth of social development. All along historical buildings are regarded as tangible cultural heritage of human beings, they materially reveal the politics, economy, techniques, history, culture, art and value in old days. Historical buildings are unrenowable heritage. Natural aging and artificial damage make it imperative to conserve and restore the historical buildings, so as to inherit history for a city.

Subsidiaries of Shanghai Xian Dai Architectural Design (Group) Co., Ltd. – East China Architectural Design & Research Institute Co., Ltd. and Shanghai Institute of Architectural Design & Research Co., Ltd. (founded in 1952 and in 1953 respectively) have properly kept documents of historical buildings, and recorded achievement in research, conservation and design by generations of designers.

At the end of the 1950s, Shanghai editorial board of architectural history, involving experts from Shanghai Municipal Institute of Civil Architectural Design, East China Industrial Design Institute and Tongji University, was established under the guidance of Shanghai construction committee. The Board was set at Shanghai Municipal Institute of Civil Architectural Design where large quantities of files and photographs were in the custody. In 1988, *The History of Modern Architecture in Shanghai*, edited by Shanghai Municipal Institute of Civil Architectural Design, with Chen Congzhou and Zhang Ming as managing editors, was published. The book intended to promote affluent tangible cultural heritage in Shanghai – modern historical buildings, lay academic groundwork for conservation on Shanghai historical buildings, and carried imponderable importance within.

In 2006, while Shanghai Xian Dai Architectural Design (Group) Co., Ltd. was underway to found Historical Building Conservation Technology Center, in retrospect, almost a hundred conservation projects have been completed. Among them, most were declared Key Protected Cultural Relic Sites of China, Protected Cultural Relic Sites of Shanghai or Outstanding Historical Buildings of Shanghai. In the archives

of the Group there still stand piles of drawings of restoration design and relevant historical documents.

From hand-made pencil sketches in 1950s to computer graphics in recent 10 years, from 120 black and white film photographs to color digital imaging today, we can severely feel the architects' spirits of inheriting history and seeking for constant improvement. Abiding by the principles of following to historical authenticity and restoring as origin, those architects conducted precise and scientific design by using historic materials and techniques, and did their endeavor to conserve urban historic heritage of Shanghai. Hence, restoration details, techniques, processes and problems have been all meticulously recorded in the files, summarizing the conservation and renovation on outstanding historic buildings since the 1950s; the thoughts, the techniques, the manners and even the accurate blueprints involved can be honored as valuable historic heritage, to embody somewhat academic and historic value which is well worth exploring and inheriting.

Among the vast documents, we picked out 20 restoration projects, of which the annals almost covers half a century, including well-known buildings on the Bund, long-standing Chinese traditional buildings, revolutionary monuments, religious buildings, as well as the "youngest" Outstanding Historical Building in Shanghai which was erected in 1955. Sorting out the files, especially facing the designs finished during the period from the 1950s to the 1980s, affords us an opportunity to learn from our predecessors.

This book introduces historical evolution, restoration techniques, main points of design and comments of the selected projects; it also shows some retraced drawings, and intends to keep due technical and academic level.

In principle, the projects adopt the name used when the restoration was carried out; and for some inappropriate ones, their original names are attached, like noting (Shanghai YMCA Building) at the side of Project 10 "Young Men's Association Building".

The authenticity of appearance and key protected parts inside has been guaranteed, no matter the building underwent "preservation", "restoration" or "interior fitment". Some buildings were restored to original look (like Zhenru Temple) through adequate study; for some others, due to changes in function, partial adjustment or extension was carried out.

Former names of involving design units were retained in the book. Shanghai Institute of Architectural Design & Research Co., Ltd (SIADR) was once called Design Section of Technology Department of Shanghai Construction Engineering Bureau, Shanghai Architectural Design Company, Shanghai Municipal Institute of Civil Architectural Design (SMICAD), Shanghai Municipal Institute of Planning and Architectural Design, and Shanghai Institute of Architectural Design and Research. Besides, Architectural Design Company of East China Ministry of Architecture Industry, East China Industrial Architectural Design Institute, and East China Architectural Design and Research Institute all represent East China Architectural Design & Research Institute Co., Ltd. (ECADI).

The main designers mentioned in the book are major professionals engaged in the projects then. All the dimensions annotated are the same with the original ones.

This book contains several faded old photographs which tell the stories before and after the restoration. Hand-made pencil sketches in the 1950s, like the drawings of Longhua Pagoda, are also collected. On that brittle paper, delicate outlines are visible all the same. Through the pages of manuscripts featuring Yuyuan Garden, predecessors' devotion sparkles as treasure, mentally nurturing their successors.

*Tang Yuen, Zhang Jiezheng*

June 20, 2009

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原有名称：龙华塔

建成年代：977年（宋太平兴国二年）

工程地址：上海市龙华路2853号

保护级别：全国重点文物保护单位

工程性质：修复

建设单位：上海市人民政府文化事业管理局

修复设计单位：上海市建筑工程局生产技术处设计室

修复设计日期：1953~1954年

主要设计人员：建筑 乔舒祺、程鹤鸣

结构 汤纪鸿

## 一. 历史沿革

龙华塔相传建于三国吴赤乌十年（247年）<sup>①</sup>，唐乾符、广明年间（874~881年）寺、塔俱毁，现存古塔为宋太平兴国二年（977年）重建，后历年损毁修葺，历史风貌混杂。

解放后，龙华寺由人民政府接管，1954年龙华塔经全面大修，恢复了宋式原貌。1959年5月26日，龙华塔被列为上海市首批甲级文物保护单位，2006年5月25日公布为第六批全国重点文物保护单位。

## 二. 建筑概况

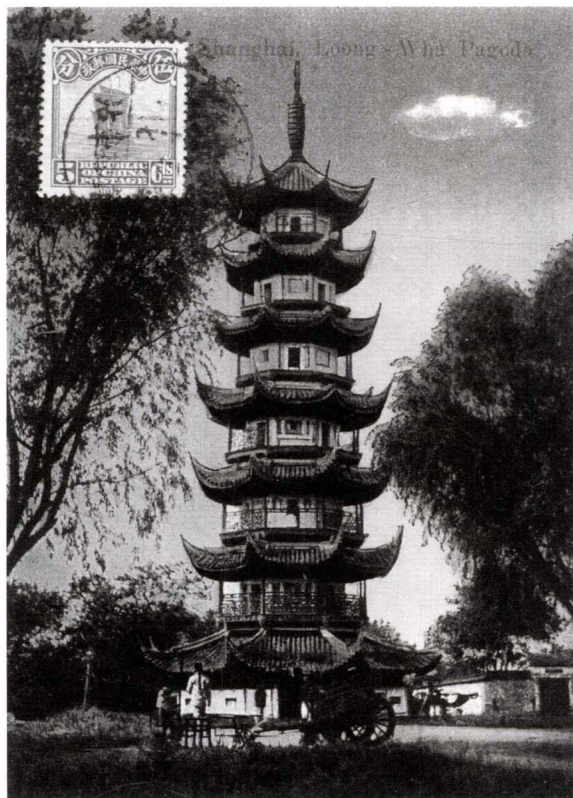
龙华塔为楼阁式塔，砖木结构，八角形平面，七层，总高40.64m。

塔基分四层，最下层为截面14cm×18cm、长30m木桩，桩间填三合土，上铺13cm厚垫木，木上加5层菱角牙子砖，最上层为20层方砖砌筑的砖基。

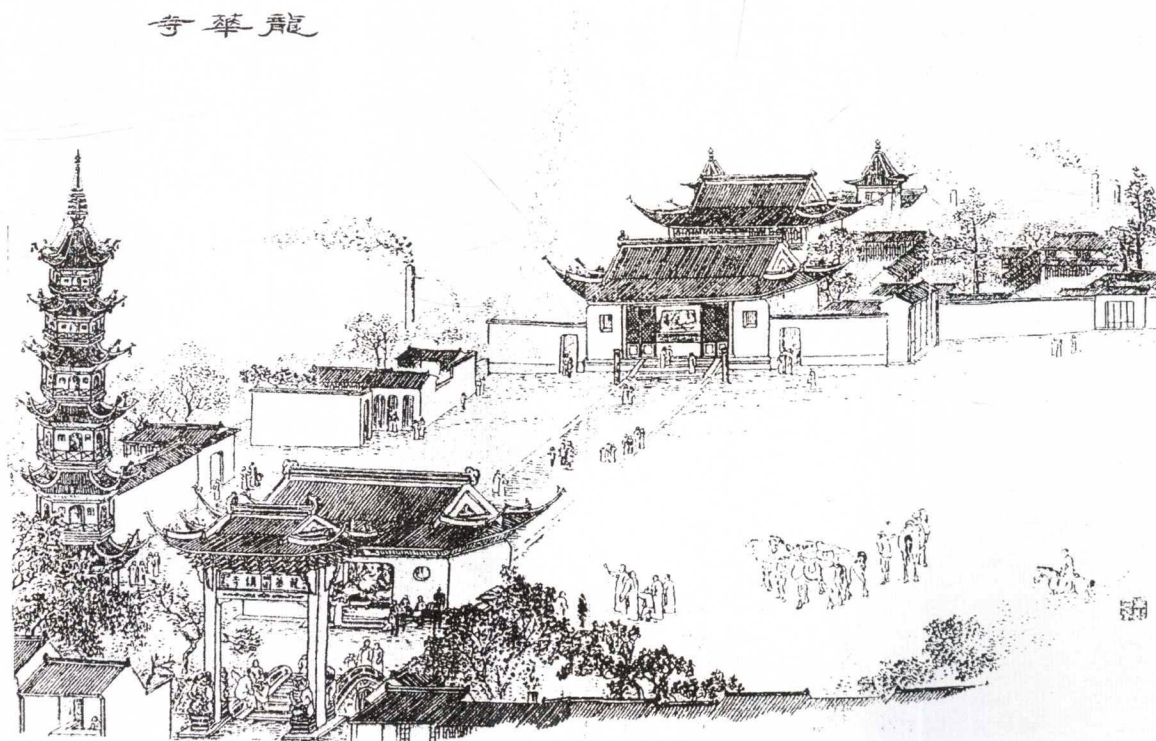
塔身为空筒式，外壁八边形，内为隔层错方向方室。底层八边形基座直径13.4m，柱间径10.4m。室内有木梯贯通七层，从第二层起塔身外设腰檐、平座和栏杆，飞檐高翘，檐下悬挂古钟式铜铃56只。每层四面设壶门，另四面隐出矩形壁龛，但未置佛像。壶门方向逐层转换，使墙体承重均衡。各层施木楼板，楼板下隐出砖拱，拱头卷刹分三瓣，外檐转角铺作施鸳鸯交手拱。底层廊柱柱头呈梭形，额枋施七朱八白装饰，枋底呈琴面。均属宋塔特征。

塔顶层竖立一根铁制塔刹，高8.25m，由覆钵、露盘、七重相轮、宝瓶、浪风索等18个构件组成。

<sup>①</sup> 见《龙华镇志》63-68页“龙华寺”篇“始建兴废”章“附：始建考”节。

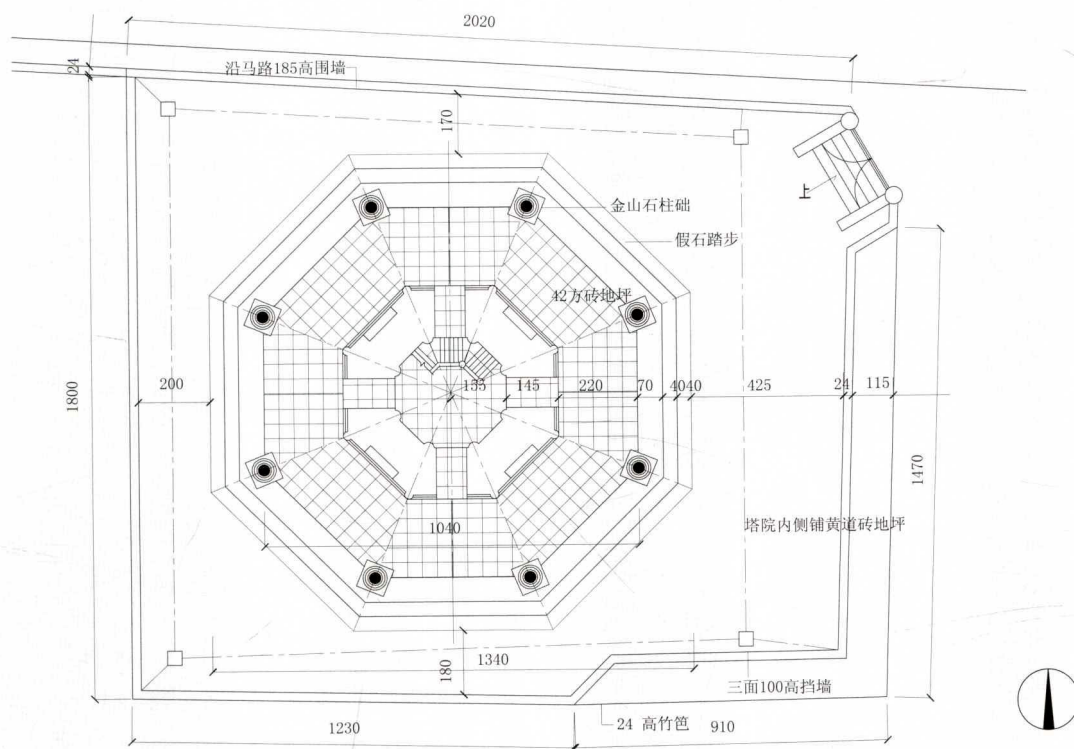


1-1 民国年间龙华塔历史照片明信片 《旧上海明信片》

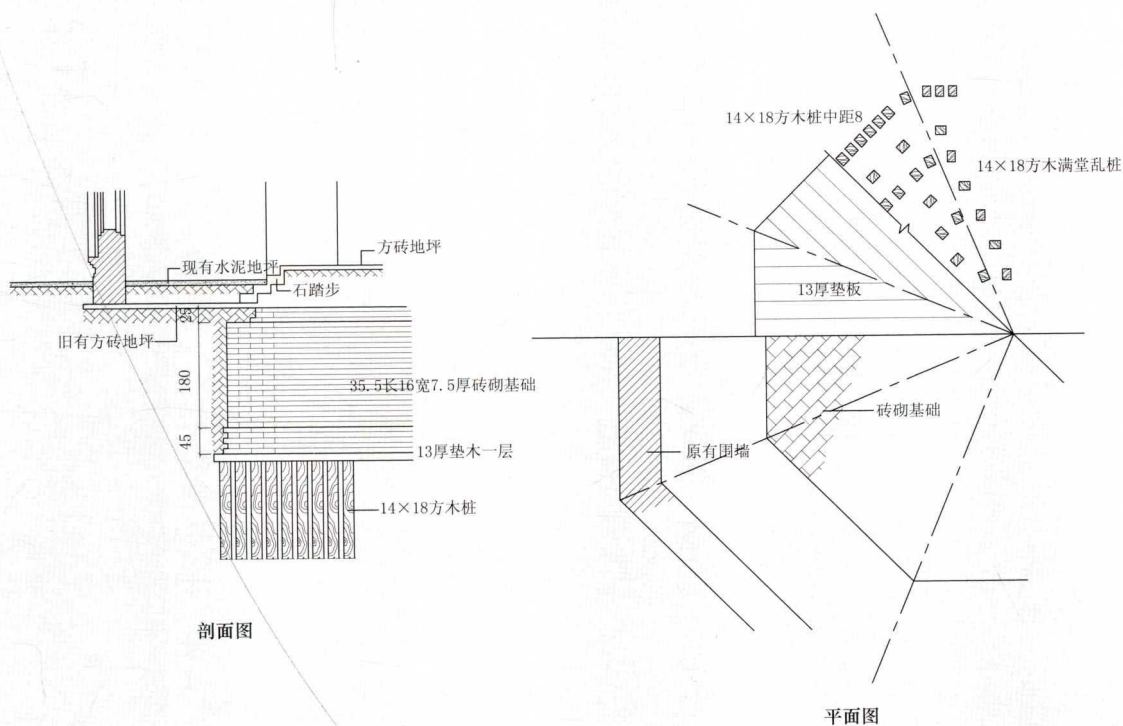


1-2 龙华寺、塔插画 Illustration of Longhua Temple and Longhua Pagoda 《上海寺庙旧志八种》，“龍華志共讀樓鈔本” p4-5





1-3 修复设计塔院总平面图 (注: 本项目所有图纸尺寸标注单位为厘米) Master Plan



1-4 修复设计基础 Foundation

Longhua Pagoda is one of the oldest Buddhist building in Shanghai. It is recorded to be first built in 247 AD, during the Three Kingdoms Period. The existing structure was rebuilt in 977 AD, during the Northern Song Dynasty. Over years of damage and restoration, it is now characterized by various styles. Standing 40.64 meters high, the multi-storied pagoda has a brick-wooden structure, with seven stories and eight faces. It bears a hollow core surrounded by a wooden staircase. Starting at the second story, the pagoda is decorated with balconies, balustrades and eaves. There are four doors on each story; each set of doors varies in directional orientation. The pagoda boasts architectural qualities of Song Dynasty, like cross bracket sets, shuttle-shaped column tops and curved beam bottoms. The restoration of the pagoda was carried out in 1954 following the Song Dynasty style. In May 2006, the structure was declared a key protected cultural relic site of China.

### 三. 修复设计背景

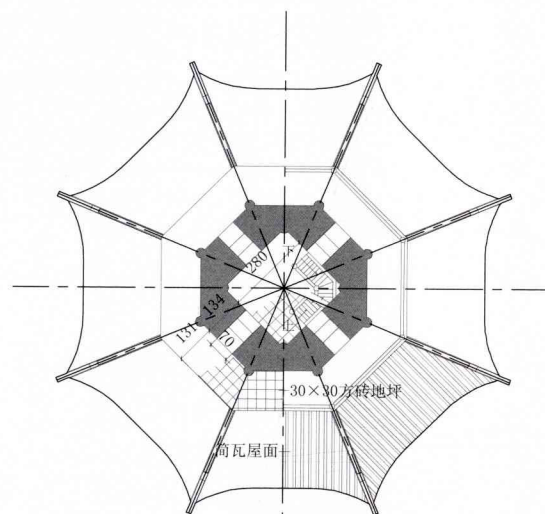
1953年, 为贯彻中央保护古文物建筑办法的原则, 对宋代建筑龙华塔进行测量检查。上海市人民政府文化事业管理局决定对龙华塔进行抢修加固。

中央文化部指示必须按宋式原样进行修复。修复设计前曾请南京工学院刘敦桢教授来沪, 对龙华塔修复提指导意见。1953年7月, 乔舒祺、程鹤鸣二人先实地测绘, 再进行修复设计, 并赴苏州勘察双塔等古塔, 在同济大学陈从周教授帮助指导下, 最终完成设计方案, 经中央批准后进行施工。

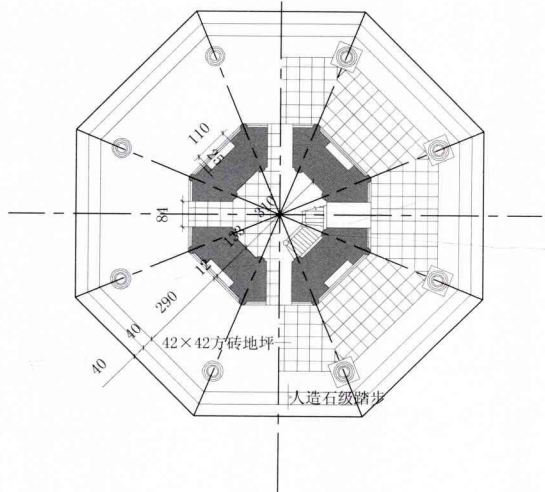
### 四. 修复设计前存在问题

1. 龙华塔塔身存在倾斜状况, 结构有塌落处。经仔细勘测, 倾斜水平角度为 $0^{\circ} 42'$ 。
2. 勘察发现塔柱有虫蛀情况, 受害木材表面只有很多小孔, 剥开外皮, 内部已成粉屑。
3. 塔顶航空灯电线腐烂。
4. 龙华塔建成后, 经各朝代数度修建, 其部分建筑构件已受明清建筑影响。

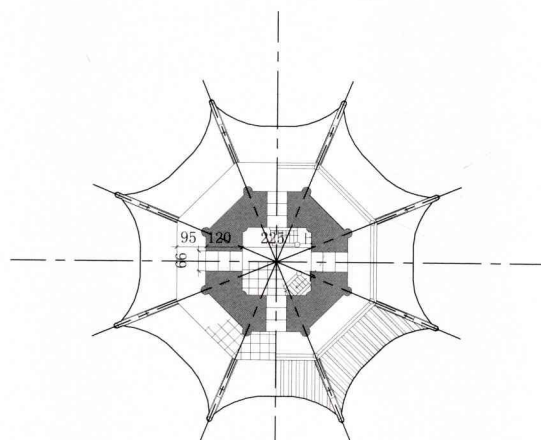




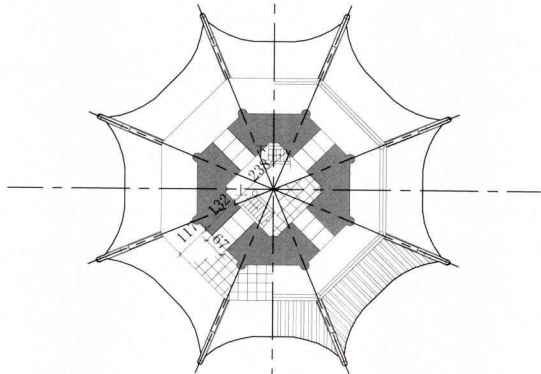
二层平面图



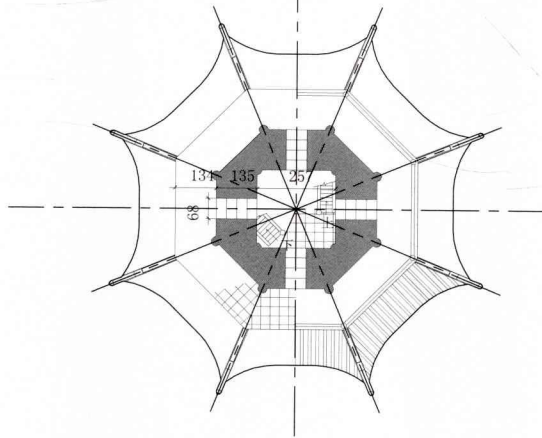
一层平面图



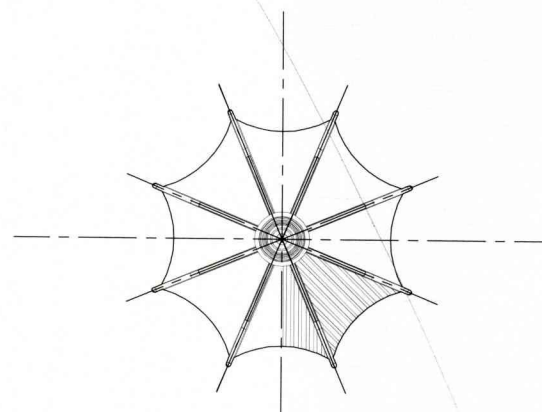
五层平面图



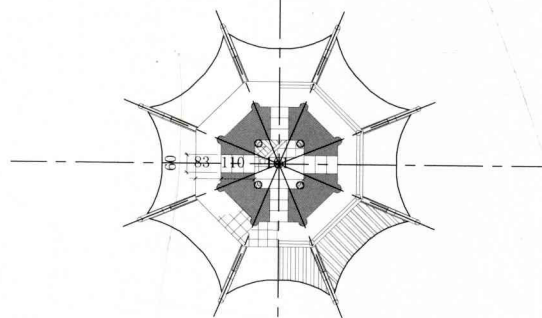
四层平面图



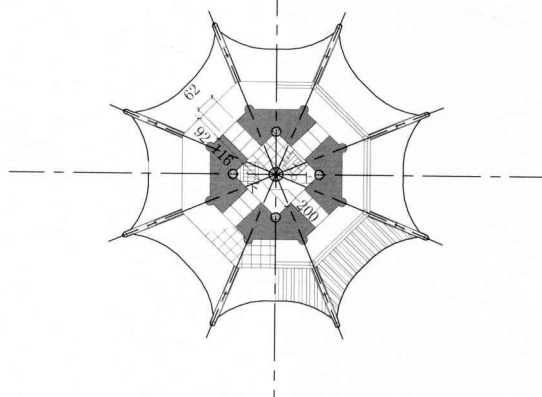
三层平面图



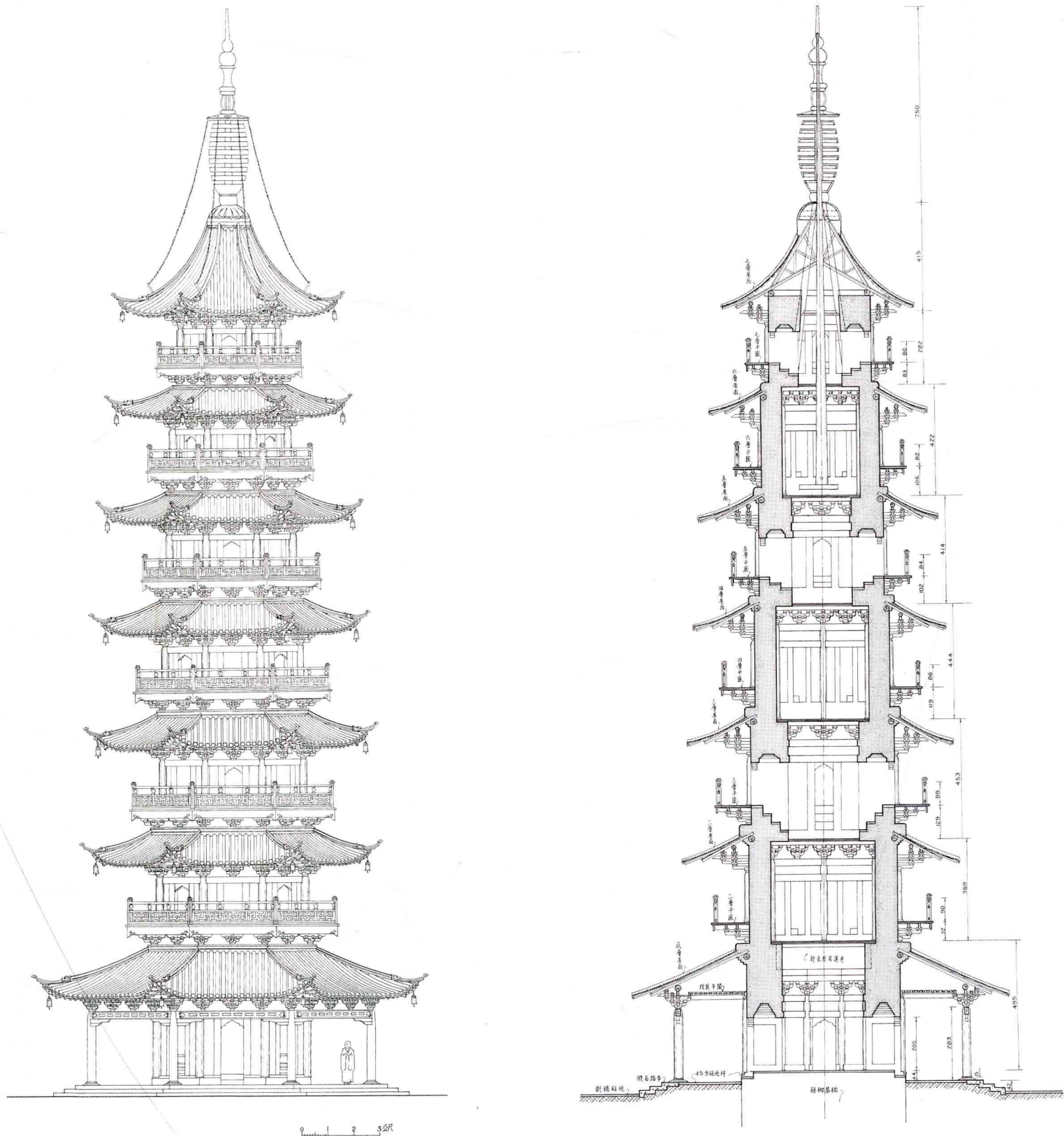
塔顶平面图



七层平面图



六层平面图



1-6 修复设计立面图、剖面图（铅笔手工绘制施工图） Elevation and section 上海现代建筑设计集团档案室藏 工程编号：53-2-49，图号：建施4、5





## 五. 修复设计原则

中央文化部对龙华塔修理工程提出指示，必须恢复宋塔原来样式，为保护文物古迹，应特别着重从考古着手，古塔修理全国范围尚属初次，必须慎重进行作为典型范例。

## 六. 修复要点和技术

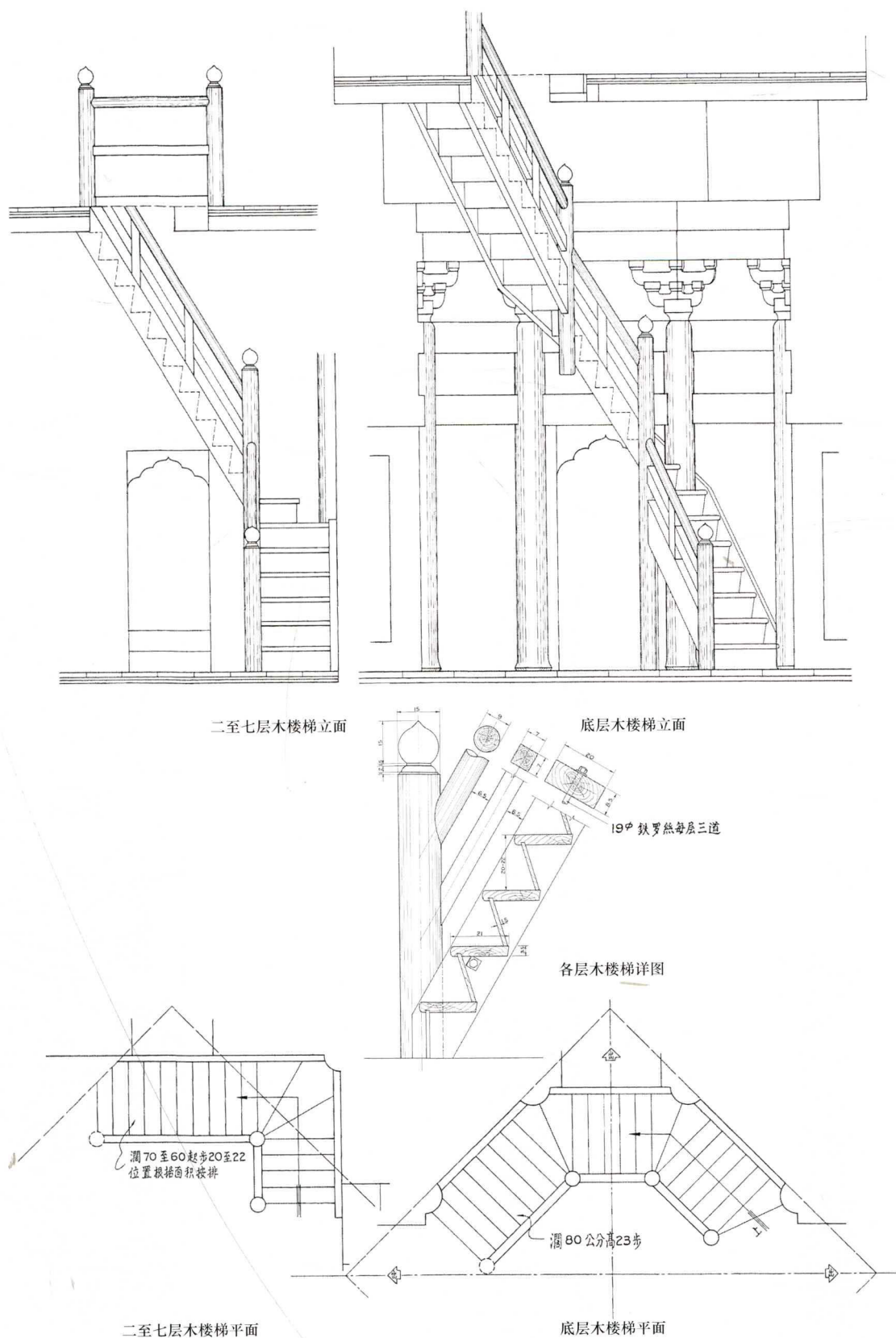
1. 扶正倾斜塔身：因塔身倾斜为 $0^{\circ} 42'$ ，为此程鹤鸣、汤纪鸿工程师专程去南京工学院向古建筑专家刘敦桢请教，刘教授意见：要治本，先解决扶正问题，再进行修理。具体方法为：（1）掘沟探查塔基；

（2）钻探勘察塔基周围土体；（3）速与波兰大使馆联系，以先进方法进行加固扶正（中央建筑研究院曾介绍波兰扶正倾斜工厂烟囱的方法）。回沪后除第三条方法因需文化部与波兰大使馆联系，第一、二条方法当即实施，根据开掘的塔身基础计算，塔身地下重量为196t，地面重量为835t，在市工务局市政桥梁工程专家徐以枋指导下，以1：4：8混凝土填实塔基沟坑，扶正塔身。

2. 祛除塔柱蛀痕：1953年7月24日邀请华东行政委员会、农林水利局、昆虫学家钱念曾驻现场察看后，鉴定意见系粉蛀甲虫所害，而非白蚁。在木材使用前用化学药品处理可起到防治作用，在已使用的木材中发现虫害则处理较难，往往不能将害虫彻底杀尽。针对龙华塔虫蛀情况，钱念曾先生建议：先将外层虫蛀小孔刨去一层，如内部发现虫害细粉必须彻底清除。如内部尚属完整，先涂透火油，再涂柏油，磨沙后加漆，保证长期使用。

3. 更换航空灯电线：经数次与龙华机场联系沟通，机场决定将旧线拆去，换装铅皮新线。

4. 恢复古塔风貌：乔舒祺建筑师偕同市文化局徐孝穆、同济大学教授陈从周至苏州双塔、虎丘塔、北寺塔考察后，在陈教授的指导下，按照宋代古塔，勾画了各项细部图像，1954年6月完成了详细的古塔修复设计建筑图纸绘制工作。



1-9 修复设计木楼梯详图 (铅笔手绘制施工图) Wooden staircase detail 上海现代建筑设计集团档案室藏 图号: 9-8