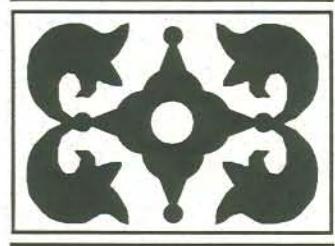

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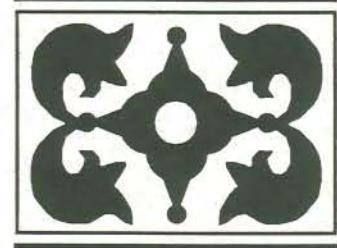
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APPENDIX



Appendix



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The Preservation of Historic Glazed Architectural Terra-Cotta, de Teel Patterson Tiller

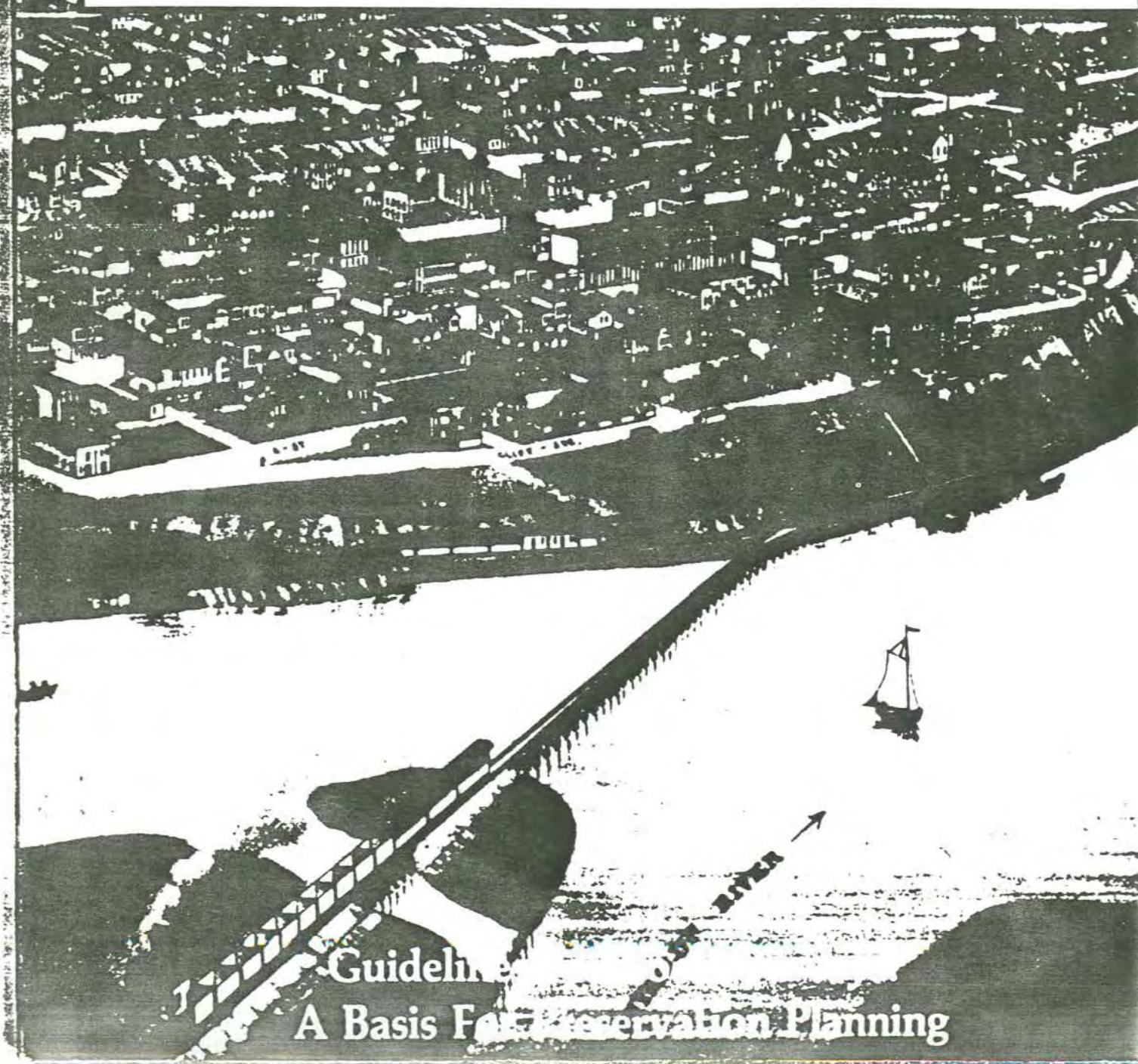


APPENDIX A

NATIONAL REGISTER BULLETIN

Technical information on comprehensive planning, survey of cultural resources, and registration in the National Register of Historic Places.

U.S. Department of the Interior
National Park Service
Interagency Resources Division



Guidelines For Local Surveys: A Basis For Preservation Planning

National Register Bulletin 24

Anne Derry
H. Ward Jandl
Carol D. Shull
Jan Thorman

1977
REVISED, 1985, by Patricia L. Parker

National Register of Historic Places
Interagency Resources Division
National Park Service
U.S. Department of the Interior
Washington, DC

Acknowledgments

Many professionals in the National Park Service made valuable contributions to the preparation of the original, 1977 issue of this publication. William G. Reeves, the late Carolyn Hamm, and Steven R. Rottenbaum of the National Register and Thomas F. King of Interagency Archeological Services prepared drafts for certain sections of this publication, while Katherine H. Cole, Charles Herrington, and the late Wilford Cole provided helpful comments on the entire manuscript. Editorial assistance was provided by Sarah A. Fackelman. The National Trust for Historic Preservation, the U.S. Department of Housing and Urban Development, and many private consultants with considerable survey experience made a number of useful suggestions during the early stages of this project.

The 1977 issue was thoroughly revised and updated in 1985 by Patricia L. Parker. The National Alliance of Preservation Commissions, the National Conference of State Historic Preservation Officers, and staff of the Interagency Resources Division of the National Park Service provided helpful comments on the revised manuscript. Linda McClelland of the National Register provided editorial assistance in preparing the revised manuscript for publication.

We are grateful for the assistance of these people in the preparation of *Guidelines for Local Surveys*.

Anne Derry H. Ward Jandl Carol D. Shull
Jan Thorman

Foreword

Over the last 80 years, Congress and the President have given the Department of the Interior major responsibilities in identifying, registering, and protecting the Nation's historic resources. With the National Historic Preservation Act of 1966, the Secretary of the Interior was called upon to expand and maintain a national register of historic places and to give maximum encouragement to State governments to develop statewide historic preservation programs of their own. The Act recognized that one of the prerequisites for an effective national preservation program was the identification of historic resources across the country through comprehensive statewide surveys. Through a grants-in-aid program established by the Act, limited funding was made available for survey work at both the State and local levels.

During the 1970s, stimulated by implementation of the National Historic Preservation Act and growing interest in their own historic resources, local governments across the Nation developed and expanded their historic preservation programs. When the National Historic Preservation Act was amended in 1980, Congress recognized this growing interest by mandating increased assistance to local governments whose preservation programs are certified by the State Historic Preservation Officer and the Secretary of the Interior as meeting high professional standards.

Historic resource surveys and their resulting inventories form an important basis for planning decisions that affect the quality of our community life. In order to plan for the preservation and enhancement of the

historic environment, it is necessary to determine what properties make up that environment. It is thus no surprise that the effectiveness of the National Register of Historic Places as a planning tool depends upon the quality and comprehensiveness of survey activity.

Basic standards and guidelines for historic preservation surveys have been published by the Department of the Interior as part of the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*. To provide further assistance to communities and local governments in the conduct of high quality surveys, the National Register has prepared *Guidelines for Local Surveys: A Basis for Preservation Planning*. This bulletin is intended to provide a wide range of information on identifying, registering, and protecting historic resources.

The original version of *Guidelines for Local Surveys* was published in 1977, and quickly became one of the National Park Service's most popular historic preservation publications. By 1984 the original version was out of print, and badly outdated as the result of changes in laws (notably the 1980 National Historic Preservation Act amendments), policies, regulations, the organization of the national historic preservation program, and the sophistication of many State and local preservation programs. Accordingly, the National Park Service undertook a comprehensive rewrite of the publication in 1985, to produce the present volume.

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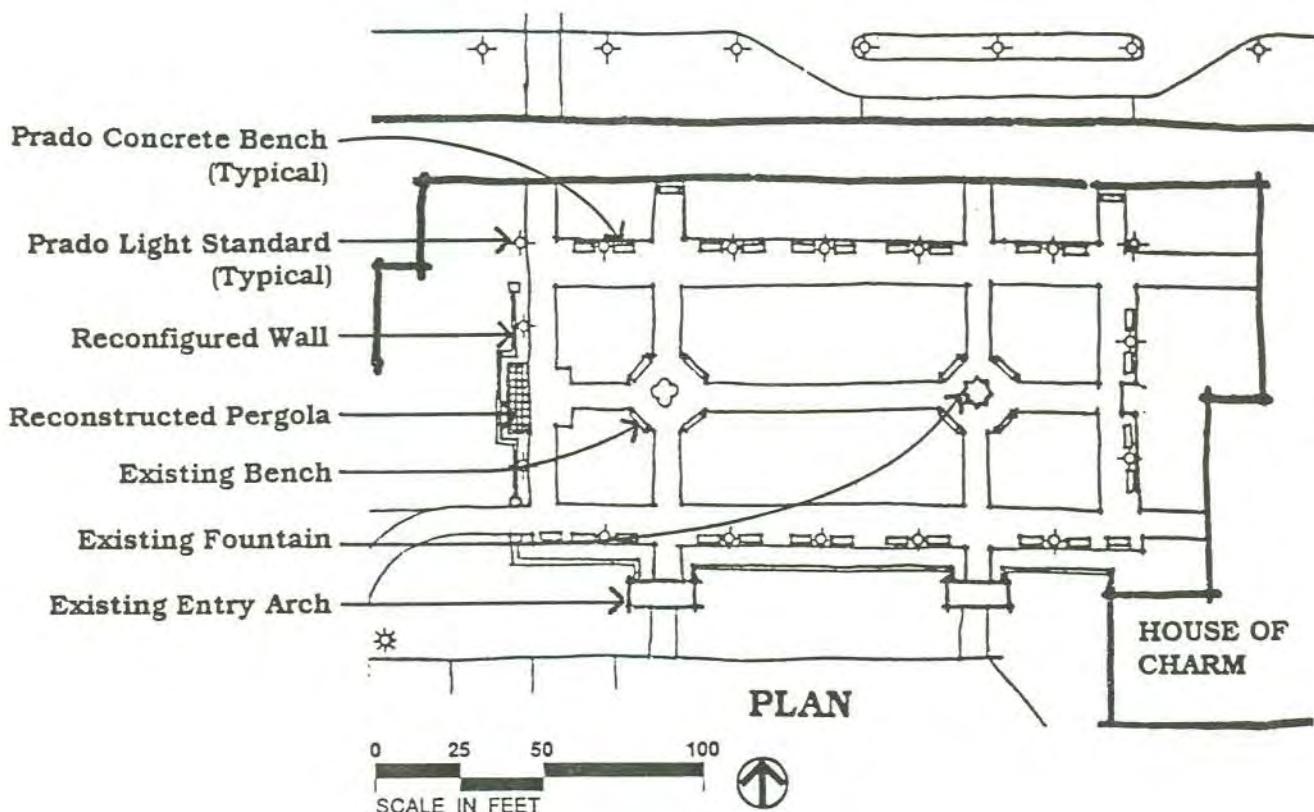
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3. Alcazar Garden

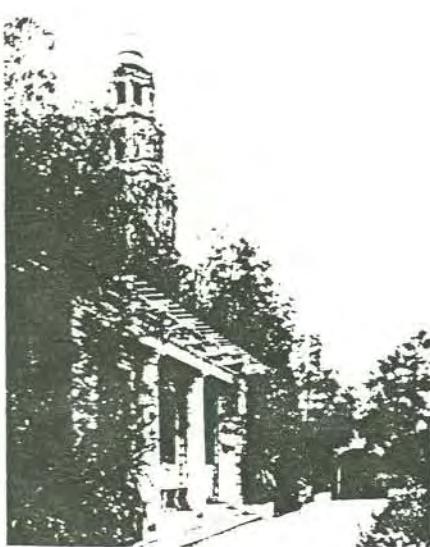
Design Objective:

Rehabilitate the garden fixtures and hardscape.



Recommendations:

- Reconstruct the historic pergola on the west side of the garden that existed during the 1915 and 1935 Expositions.
- Remodel the masonry wall on the west side of the garden as shown on the plan to match south wall.
- Renovate the existing south entry arches.
- Remove the existing flood lights from the south entry arches and install pole lights as shown on the plan.
- Widen sidewalks to accommodate concrete benches and light standards.
- Rehabilitate the entry pilasters on the southwest entry.
- Rehabilitate the garden fountains and nearby benches to their 1935 appearance.
- Relocate the maintenance area adjacent to the garden to a new ground maintenance building on the west side of the Alcazar parking lot.



The Alcazar garden pergola as it appeared in 1915.



Implementation Priorities and Cost Estimates

WEST PRADO	Priority				Approximate Cost (in 1991 dollars)
	No. 1	No. 2	No. 3	No. 4	
House of Charm/Arcades Reconstruction	●				9,240,000
Museum of Man/Mechanical Upgrades	●				1,890,000
Museum of Man Interior Expansion*					
Plaza de California		○			50,000
Old Globe Administration Building**	●				1,155,000
Old Globe Plaza*					
West Prado Streetscape		○			350,000
Alcazar Garden			●		600,000
Museum of Art - Mechanical Upgrades	●				1,449,000
Plaza de Panama		●			1,500,000
The Mall		○			600,000
Palm Canyon/Archery Range				○	150,000
Grounds Maintenance Buildings		○			160,000
Priority Subtotals		\$ 13.7 Million	\$ 2.7 Million	\$600,000	\$150,000
West Prado Total		\$ 17.2 Million			

EAST PRADO

House of Hospitality Reconstruction	●				12,232,500
Natural History Museum Mechanical Upgrade	●				2,205,000
Natural History Museum Expansion*					
Botanical Building Structural Improvements	●				105,000
Botanical Building Historical Renovation				○	200,000
Botanical Building Lawn Area				○	300,000
East Prado Streetscape/ Village Promenade			○		700,000

* Privately funded

** City contribution to a privately funded project



APPENDIX B

U.S. Department
of the Interior
National Park
Service

The Secretary of the Interior's
**Standards for
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THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed or eligible for listing in the National Register of Historic Places. In partial fulfillment of this responsibility, the Secretary of the Interior's Standards for Historic Preservation Projects have been developed to direct work undertaken on historic buildings.

Initially used by the Secretary of the Interior in determining the applicability of proposed project work on registered properties within the Historic Preservation Fund grant-in-aid program, the Standards for Historic Preservation Projects have received extensive testing over the years—more than 6,000 acquisition and development projects were approved for a variety of work treatments. In addition, the Standards have been used by Federal agencies in carrying out their historic preservation responsibilities for properties in Federal ownership or control; and by State and local officials in the review of both Federal and nonfederal rehabilitation proposals. They have also been adopted by a number of historic district and planning commissions across the country.

The Standards for Rehabilitation (36 CFR 67) comprise that section of the overall historic preservation project standards addressing the most prevalent treatment today: Rehabilitation. "Rehabilitation" is defined as the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values.

The Standards for Rehabilitation are as follows:

1. Every reasonable effort shall be made to provide a compatible use for a property which requires minimal alteration of the building, structure, or site and its environment, or to use a property for its originally intended purpose.
2. The distinguishing original qualities or character of a building, structure, or site and its environment shall not be destroyed. The removal or alteration of any historic material or distinctive architectural features should be avoided when possible.
3. All buildings, structures, and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged.
4. Changes which may have taken place in the course of time are evidence of the history and development of a building, structure, or site and its environment. These changes may have acquired significance in their own right, and this significance shall be recognized and respected.

In terms of specific project work, preservation of the building and its historic character is based on the assumption that (1) the historic materials and features and their unique craftsmanship are of primary importance and that (2), in consequence they will be retained, protected, and repaired in the process of rehabilitation to the greatest extent possible, not removed and replaced with materials and features which appear to be historic, but which are—in fact—new.

To best achieve these preservation goals, a two-part evaluation needs to be applied by qualified historic preservation professionals for each project as follows: first, a particular property's materials and features which are important in defining its historic character should be identified. Examples may include a building's walls, cornice, window sash and frames and roof; rooms, hallways, stairs, and mantels; or a site's walkways, fences, and gardens. The second part of the evaluation should consist of assessing the potential impact of the work necessary to make possible an efficient contemporary use. A basic assumption in this process is that the historic character of each property is unique and therefore proposed rehabilitation work will necessarily have a different effect on each property; in other words, what may be acceptable for one project may be unacceptable for another. However, the requirement set forth in the definition of "Rehabilitation" is always the same for every project: those portions and features of the property which are significant to its historic, architectural, and cultural values must be preserved in the process of rehabilitation. To accomplish this, all ten of the Secretary of the Interior's "Standards for Rehabilitation" must be met.

Identify, Retain, and Preserve

The guidance that is basic to the treatment of all historic buildings—identifying, retaining, and preserving the form and detailing of those architectural materials and features that are important in defining the historic character—is always listed first in the "Recommended" column. The parallel "Not Recommended" column lists the types of actions that are most apt to cause the diminution or even loss of the building's historic character. It should be remembered, however, that such loss of character is just as often caused by the cumulative effect of a series of actions that would seem to be minor interventions. Thus, the guidance in all of the "Not Recommended" columns must be viewed in that larger context, e.g., for the total impact on a historic building.

Protect and Maintain

After identifying those materials and features that are important and must be retained in the process of rehabilitation work, then protecting and maintaining them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic material through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, protective plywood, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.

Repair

Next, when the physical condition of character-defining materials and features warrants additional work repairing is recommended. Guidance for the repair of historic materials such as masonry, wood, and architectural metals again begins with the least degree of intervention possible such as patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading them according to recognized preservation methods. Repairing also includes the limited replacement in kind—or with compatible substitute material—of extensively deteriorated or missing parts of features when there are surviving prototypes (for example, brackets, dentils, steps, plaster, or portions of slate or tile roofing). Although using the same kind of material is always the preferred option, substitute material is acceptable if the form and design as well as the substitute material itself convey the visual appearance of the remaining parts of the feature and finish.

Replace

Following repair in the hierarchy, guidance is provided for replacing an entire character-defining feature with new material because the level of deterioration or damage of materials precludes repair (for example, an exterior cornice; an interior staircase or a complete porch or storefront). If the essential form and detailing are still evident so that the physical evidence can be used to re-establish the feature as an integral part of the rehabilitation project, then its replacement is appropriate. Like the guidance for repair, the preferred option is always replacement of the

Additions to historic buildings are referenced within specific sections of the guidelines such as Site, Roof, Structural Systems, etc., but are also considered in more detail in a separate section, NEW ADDITIONS TO HISTORIC BUILDINGS.

Health and Safety Code Requirements; Energy Retrofitting

These sections of the rehabilitation guidance address work done to meet health and safety code requirements (for example, providing barrier-free access to historic buildings); or retrofitting measures to conserve energy (for example, installing solar collectors in an unobtrusive location on the site). Although this work is quite often an important aspect of rehabilitation projects, it is usually not part of the overall process of protecting or repairing character-defining features; rather, such work is assessed for its potential negative impact on the building's historic character. For this reason, particular care must be taken not to radically change, obscure, damage, or destroy character-defining materials or features in the process of rehabilitation work to meet code and energy requirements.

Specific information on rehabilitation and preservation technology may be obtained by writing to the National Park Service, at the addresses listed below:

Preservation Assistance Division
National Park Service
Department of the Interior
Washington, D.C. 20240

National Historic Preservation
Programs
Western Regional Office
National Park Service
450 Golden Gate Ave.
Box 36063
San Francisco, CA 94102

Division of Cultural Resources
Rocky Mountain Regional Office
National Park Service
655 Parfet St.
P.O. Box 25287
Denver, CO 80225

Preservation Services Division
Southeast Regional Office
National Park Service
75 Spring St. SW., Room 1140
Atlanta, GA 30303

Office of Cultural Programs
Mid-Atlantic Regional Office
National Park Service
143 S. Third St.
Philadelphia, PA 19106

Cultural Resources Division
Alaska Regional Office
National Park Service
2525 Gambell St.
Anchorage, AK 99503



APPENDIX C

HISTORIC PRESERVATION SERVICE TRAINING PROGRAM

URBAN CORPS OF SAN DIEGO



David B. Richardson, M.A., M.F.A.

June 2, 1992



FROM THE OFFICE OF THE EXECUTIVE DIRECTOR

The Urban Corps of San Diego is a private, non-profit organization, chartered originally in 1988 by the City of San Diego, and then left to develop its own resources under the able administration of a Board of Directors comprised of business, industry, education, and political leaders.

The Urban Corps is a service organization whose multiple goals are best expressed, as follows:

- * To provide career and educational opportunities for San Diego youth, ages 18 to 23, who are at risk for lack of employable skills and education.
- * To preserve and protect San Diego's environment through vital conservation work.
- * To conserve our natural resources by means of effective and comprehensive community recycling operations.
- * To enhance the natural beauty of San Diego's environment through litter abatement programs and waste reduction education.
- * To preserve for future generations our historic past through the restoration of San Diego's historic buildings, monuments, and artifacts.
- * To provide services for the greater San Diego community in conservation-related programs on a cost-effective basis that may not normally be available through regular community resources.

The Urban Corps' partnership participation with the Maritime Museum of San Diego in this apprentice program is a golden opportunity to serve both our youth and the community. The community profits both from a growing and skilled labor pool and from the preservation of valuable records of our historic past.

A two way partnership, however, is an effective limit to the rich and significant possibilities inherent in a program of such promise. All segments of the community, joined together, could create a model of education, training, historic preservation, and environmental protection that is to be found nowhere else in the nation.

We welcome help of any kind from individuals and organizations that have the vision to see and understand the significance of this important undertaking.

[Signature]
Sam Duran
Executive Director

INTRODUCTION

Today's Urban Corps of San Diego is providing constructive training, work experience, and education for unemployed youth. It is working in the tradition of the Civilian Conservation Corps of the 1930's and the California Conservation Corps.

While pursuing these admirable goals, the Urban Corps has also provided valuable community services to non-profit organizations and local, and state government agencies. These services will be needed more than ever because of the current fiscal crisis facing our city and state. Many organizations and agencies will be unable to maintain at current levels their operational and social mandates. It becomes more clear that cost effectiveness and private sector initiatives must be given earnest consideration.

Congressional bi-partisan support of The National and Community Service Act of 1990 is a consensus for voluntary efforts of citizens to maintain and rebuild public infrastructures (Appendix D). This renewal of the ethics of civic responsibility has stimulated public and private sector cooperation in seeking solutions to meet human, educational, economic, and environmental needs, particularly those related to poverty.

In preparing to meet the challenge, the Urban Corps of San Diego is actively considering ways to provide needed community services while also fulfilling its expressed educational goals. One area of critical concern for California was pointed out recently by Governor Wilson's Executive Order, W-26-92 (Appendix E). It defines the often overlooked importance of cultural and historic resources to the people and tourism economy of California. To preserve these valuable resources, it directs state agencies to be proactive in developing historic preservation management plans and updating inventories. While historic preservation service projects are traditional in conservation corps programs, Governor Wilson's Executive Order reinforces the need for continued efforts in this area.

At a local level, city and county economic development task force reports also point out the vital importance of giving priority support to tourism.^{18,19} Current analyses, especially the Balboa Park Central Mesa Precise Plan,³ suggest that present fiscal constraints jeopardize the preservation,

INTRODUCTION, continued

maintenance, and repair of cultural and historic resources that are key elements to San Diego County's tourism economy.

In light of these facts, The Urban Corps of San Diego proposes to develop a Historic Preservation Service Training Program that will facilitate the training of a work force that will have the technical skills, high standard of craftsmanship, and educational background to assist in the preservation of cultural and historic resources. To achieve this goal, the following plan will outline the phased program development and introduce the pilot projects.

David B. Richardson

June 2, 1992

HISTORIC PRESERVATION SERVICE TRAINING PROGRAM

URBAN CORPS OF SAN DIEGO

ADMINISTRATIVE MISSION STATEMENT

To develop an efficient and effective program that demonstrates:

- Educational strategies that integrate the values of community service and civic responsibility, preservation of historic and natural resources and the development of academic and vocational skills.
- Utilization of existing institutional and community resources to facilitate research, design, preservation and reconstruction of community-based economic and physical infrastructures.
- Methodology to educate, train and motivate a community service work force that will have the skills, sustained commitment and economic support to solve old and new technological and environmental problems.
- Mutual benefit as a result of collaboration and cooperation between the private and public sectors.

PROGRAM CONCEPT

Corpsmembers under the supervision of professionals, work and learn together on projects that preserve historic, cultural and natural resources.

PROGRAM GOALS

The Historic Preservation Service Training Program seeks to facilitate the phased development and demonstration of the following;

- 1 To create opportunities for urban youth to participate in community service projects that build self-esteem, team work, decision making, problem solving and development of learning skills.
- 2 To educate a work force that will have the skills and commitment to preserve San Diego County's historic, cultural and natural resources.
- 3 To create new opportunities for corpsmembers to gain entry-level vocational skills and experience.

PROGRAM GOALS, continued

- 4 To create a model for the team/system approach for vocational education. Participants learn different jobs, the whole system and how it functions.
- 5 To demonstrate public and private sectors cooperation in rebuilding, restoring, and preserving physical infrastructures.
- 6 To develop educational publications and graphic materials that demonstrate the ethics and value of community service.
- 7 To facilitate inventories and surveys of historic resources including archival research of archaic materials and technologies.
- 8 To create a forum to stimulate innovation and creative thinking about the relationship between fine craftsmanship and economic development.

PARTICIPANTS AND ROLES

The Project Manager

The manager has the responsibility of directing and implementing the program as defined by the mission statement. Coordinating, facilitating and developing program activities with cooperation and input from the advisory committee and technical consultants; training and support for participants; prepare, analyze and present data in a relevant and meaningful fashion; plan and interact with the private and public sectors to accomplish program goals and objectives.

The Advisory Committee

The advisory committee members will assist the project manager in developing a program that integrates academic and vocational training with the technical skills needed for the preservation of historic and natural resources. The advisory committee will consist of members of the building trades, architecture and related design fields, historians, artist-craftsmen and business.

The Technical Consultants (1)

The technical consultant will be contracted by the San Diego Urban Corps to supervise, perform work, teach on-the-job skills as defined by a work/learn project plan. The plan will be developed by the project manager with input

PARTICIPANTS AND ROLES,

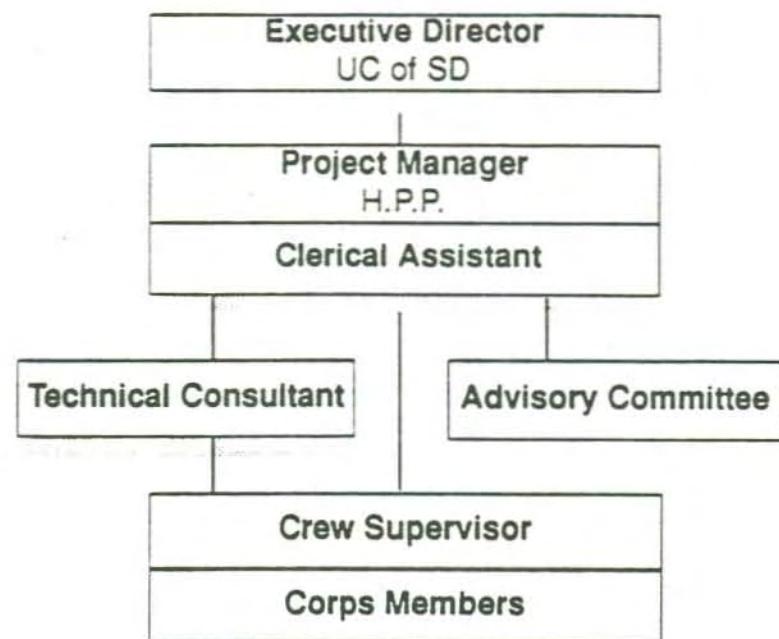
The Technical Consultants, continued

from members of the advisory committee and technical consultant. An active list of consultants will include representatives of various trades, crafts, and technical fields. Whenever possible, unemployed or under employed skilled workers will be given priority. (1) Note: During the 1930's, the Civilian Conservation Corps job title was L.E.M. or Local Experienced Men.

The Corpsmembers

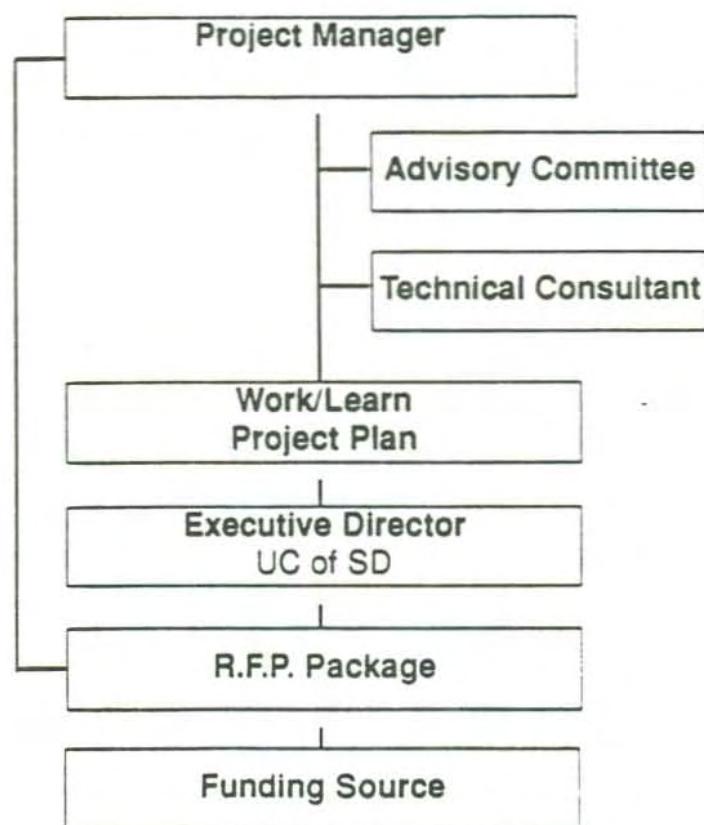
Corpsmembers after attending an informational workshop may apply to enter the training program. The executive director and project manager will review applications and make selections based on skills and aptitude assessments, education, and vocational goals of the applicant. Corpsmembers may advance from entry level work experience to specialized projects that develop technical trade and crafts skills.

PROGRAM ORGANIZATIONAL CHART



PROGRAM FUNDING DEVELOPMENT CHART

(Preparation of funding package)



PROGRAM DEVELOPMENT

PROGRAM RESEARCH DESIGN

The philosophical criteria that will guide program development are key concepts from six text references. They provide research design parameters when developing educational strategies and organizational formats that integrate program goals.

- 1 "Renewal of civic responsibility."¹ The National and Community Service Act of 1990.
- 2 "Values education through community service."¹⁰ The Delve, Mintz, and Steward Study.
- 3 "The need for training of craftspersons and technicians" and "Formal training needed for the crafts."¹⁶ James Marston Fitch, Historic Preservation: Curatorial Management of the Built World.
- 4 "The preservation and wise use of California's cultural and historic resources are of importance to the people of this state."² Governor Pete Wilson, Executive Order W-26-92.
- 5 "The transfer of skills on the job through a mentor, skilled supervisor or skilled co-workers." U.S. Department of Labor, Employment and Training Administration. "Work-Based Learning: Training America's Workers," 1989. (Appendix F).
- 6 "Most of the work in a post-industrial economy is work that requires human intelligence. In such an economy, skills of reading, writing, speech, listening, observing, measuring, calculating, and problem solving are essential preparations for any vocation. In a fast changing world in which specific vocational training will be quickly outmoded by technological, economic, and social advances, the only appropriate career education is learning how to learn."²² Adler, Mortimer J. The Paideia Program: An Educational Syllabus. New York: Macmillan Publishing, 1984.

PROGRAM DEVELOPMENT, continued

METHODOLOGY GOAL

The program will develop methods for a simplified, efficient, and effective delivery of the following four training steps;

- 1 Preparing the corpsmember.
- 2 Presenting the task.
- 3 Trying out corpsmember performance.
- 4 Follow-up on newly developed job skills.

Each of the delivery steps will present opportunities for innovation and experimentation. Pilot projects will test delivery methods.

COMMUNITY RESOURCE DEVELOPMENT GOALS

- 1 Develop a working relationship with community-based organizations, professional and trade organizations.
- 2 Develop public and private sector participation in providing transition employment, on-the-job training for corpsmembers entering the job market.
- 3 Develop relationships with artists, crafts and trades persons and their organizations to provide guidance and training methods for developing a high standard of craftsmanship.
- 4 Develop cooperative training arrangements with educational institutions.
- 5 Organize educational experiences that develop craftsmanship. Create a consortium of crafts training programs that promote vocational skill development. Incorporate craftsmanship standards proposed by the Association For Preservation Technology as a component of the training program.⁶

PROJECT DEVELOPMENT

IMPLEMENTATION - Work/Learn Program

Initially, projects and educational strategies will be developed within three areas common to historic preservation (1) survey and inventory, (2) condition reporting, (3) physical intervention, (formats and strategies detailed at the end of this section). Each of these areas will be the formats for on-the-job training projects. These formats will provide opportunities for developing educational strategies. The project formats and educational strategies will be incorporated into a Work/Learn Plan. It will be structured similarly to the Project Evaluation Form used by the California Conservation Corps.⁷ It may be revised and expanded to include specific educational goals, description of follow-up, de-briefing activities including counseling and remediation, and required craftsmanship and skill levels. In general, the Work/Learn Plan is a simplified working guide for all project participants and attempts to integrate work project objectives with vocational and educational goals.

The project manager, with input from advisory committee members and technical consultants will prepare the Work/Learn Plan. Advisory committee members and technical consultants should be proactive in suggesting leads and contacts that will result in projects that provide varying levels of on-the-job experience and educational opportunities. Technical consultants will be encouraged to present proposals to the project manager for consideration by the advisory committee. Advisory committee members may make recommendations but final selection of projects will be made by the project manager and the Urban Corps executive director.

After a Work/Learn Plan is approved, a pre-service orientation workshop for all participants will address objectives and logistics. Corpsmembers may be assigned to work in one of the following:

- Corpsmembers work in crews or individually assisting the project manager or technical consultant.
- Experienced corpsmembers may collaborate with a technical consultant to form a restoration, design, or research team.
- Corpsmembers work with private industry sector, non-profit organizations, and public agencies as interns/apprentices.

PROJECT DEVELOPMENT, continued

FORMATS AND STRATEGIES

SURVEY AND INVENTORY

Historic resource surveys and their resulting inventories form an important basis for planning decisions. In order to plan for the preservation and enhancement of cultural and historic resources, it is necessary to research all pertinent data related to the resource being considered. Training methods and guidelines for historic preservation surveys have been published by the Department of the Interior to provide assistance in conducting high quality surveys.⁴ Using these guidelines, educational opportunities for professionals and non-professionals working together is significant. The non-professional is introduced to basic research methods, information management, recording and mapping techniques as well as application of computer data and graphic systems.

CONDITION REPORT

A condition report contains descriptive records, analysis, and documentation of an artifacts physical condition. Professional skills, including visual analysis, are required. Non-professionals could be trained to assist with measurements, documentation, organization, and computer data entry. The condition report is a valuable tool in determining a physical intervention strategy.

PHYSICAL INTERVENTION

Physical intervention is a critical element of planning. The selection of strategies and therapies to preserve, conserve, and restore an artifact requires research and consultation with professionals. Site work is to be conducted under supervision and maintain a high standard of craftsmanship. The National Parks Service's "Standards For Rehabilitation"⁵ and the "Preservation Craftsmanship Guidelines" of the Association For Preservation Technology⁶ should be followed and used as a training texts.

EVALUATION/JOURNAL

The journal, while being a historic preservation professional responsibility, it is also a useful evaluation and educational tool. To encourage basic writing

EVALUATION/JOURNAL, continued

skills each corpsmembers will be required to keep a journal of notes, data, reflective and creative thoughts, drawings, and diagrams that document the individual and collective experience of the participants. The journal will be reviewed and subject to periodic critique by the project manager and the advisory committee members to subjectively evaluate the success of the program objectives. This review may identify corpsmembers who need remedial education as related to basic academic skills and literacy. If remediation is needed, the Urban Corps will provide placement in an existing remedial program or provide tutoring by a literacy volunteer.

The journal will be kept by all project participants. It must be carried and available for use at all times. The projects involving preservation formats require field notes. This is a professional responsibility and a special training workshop will be developed. Corpsmembers will develop a portfolio documenting their project participation. The journal and portfolio can be used as a valuable tool during job interviews. A job counseling workshop will address its preparation and interview use.

Corpsmembers performance evaluations will be conducted monthly using Urban Corps' existing forms and methods.⁸ Upon completion, all participants will be de-briefed to evaluate project and educational goals. All documents, field notes, journals, drawings, photographs, and videos will be inventoried and reviewed. The inventory list will be attached to the Work/Learn Plan evaluation form to be developed. The inventory of documentation will be useful in the production of the project final reports.

PROJECT DOCUMENTATION

The recording of every phase of preservation and restoration is a professional responsibility. The resulting documentation provides important resources for future research. Corpsmembers will be introduced to methods of incorporating documentation materials into resumes and portfolios. Documentation also provides valuable educational and skill development opportunities. Specialized training in note taking, drawing, journal writing, photography, computer data entry and video production will be developed.

FINAL REPORT

The final report is the organized presentation of the project documentation materials. It provides valuable information for researchers of the future. It could also contain information about educational and training methodology, technical processes, materials, and budget. Its preparation could be developed into a work/learn experience. The introduction of computer desk top publishing and graphic design provides corpsmembers with employable skills.

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Historic Preservation Service Training Corps

SUPPORT LETTERS

K. F. Franke, Capt. USCG (Ret.)
Executive Director
Maritime Museum Association of San Diego

George Loveland
Director
San Diego Parks and Recreation Department

Greg R. Sandoval
Assistant Dean, Student Support Services
Southwestern College

Les Nimmo
Coordinator, Cooperative Education Work Experience
San Diego City College

Edwin D. McKellar, Jr.
Executive Director
San Diego Aerospace Museum

Mary Allely
Supervisor, Special Collections
San Diego Public Library

Kay B. Carter
Executive Director
San Diego Railroad Museum

Mark Hoffman
Staff Associate Curator
San Diego Automotive Museum

Paul W. Johnson, A.I.A.
Robert Donald Ferris Architect Inc.



September 4, 1992

Mr. Sam Duran, Executive Director
Urban Corps of San Diego
1864 National Avenue
San Diego, California 92113

Dear Mr. Duran:

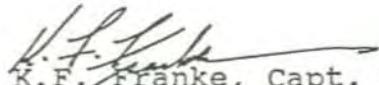
During the past quarter two Urban Corpsmen have been involved in on the job training at the San Diego Maritime Museum. We have evaluated this pilot program as a win/win situation for both the Museum and the Corps. Additionally, since June 8, 1992, five part time youths have also been undergoing this training.

We urge that the program be expanded at least to the end of the year to include (6) full time corpsmen (or women) on a 32 hour week basis.

Maritime apprenticeship is well within the objectives of the Maritime Museum in that we are able to preserve not only our historic ships, but the methods of maintaining them in the traditional manner. An example is recaulking and seam sealing the STAR OF INDIA's decks. This typical shipkeeping is hundreds of years old and is being accomplished in 1992 by 17 year olds. That's apprenticeship at its best.

Throughout the year at this museum, Corps personnel will be subjected to a broad hands-on learning experience. Skills in carpentry, wood and metal working and preservation, painting, rigging, marlinespike seamanship (knots and splices) as well as one-to-one direction from skilled maritime artisans is available. We believe this personal attention and guidance from mature family men adds to attitude enrichment and citizenship on the part of the youths. Our museum volunteers, docents and sailing crew all reflect an enthusiasm for our nautical heritage. When the Urban Corp participants learn and come to appreciate the skill it takes to keep our ships alive, it's definitely win/win!

Very truly yours,


K.F. Franke, Capt. USCG (Ret)
Executive Director
KF:et\9-1167



THE CITY OF

SAN DIEGO

PARK & RECREATION DEPARTMENT • PHONE (619) 236-6643 • FAX (619) 236-6219
CITY ADMINISTRATION BUILDING • 202 C STREET • SAN DIEGO, CA 92101-3869

GEORGE I. LOVELAND
Director

- Central
- Coastal
- Community Park & Recreation
- Golf Course Operations
- Lifeguard Services
- Management
- Open Space
- Park Development

Sam Duran
Executive Director
Urban Corps of San Diego
1864 National Avenue
San Diego, CA 92113

Dear Sam:

Re: Historic Preservation Service Training Program

The Urban Corps proposal for a Historic Preservation Service Training Program is an exciting prospect for the City of San Diego.

My staff has had nothing but praise for the efforts of the two young Corps members working on the Alcazar Garden tile restoration. Expanding that specific apprenticeship concept into a broader program of on-the-job training in historic preservation and museum skills is a tremendous idea.

The Urban Corps has an excellent reputation in the community for providing constructive training, work experience and education to unemployed youth. I see great potential in this new program for valuable interaction between Corps member interns and City employees as they maintain historic facilities in Balboa Park. Also, in light of the severe budget limitations facing the City, the availability of an organized auxiliary work force in this specialized area would be extremely beneficial.

San Diego citizens are proud of their City's Spanish heritage, which is best exemplified in the Balboa Park Historic District. The City has placed a high priority on preservation and adequate maintenance of these unique resources, and your Historic Preservation Service Training proposal offers an innovative approach to help meet that need.

I look forward to continuing the excellent working relationship my department enjoys with the Urban Corps.

Sincerely,

GEORGE LOVELAND
Director

GT-756



DIVERSITY
BRINGS US ALL TOGETHER



San Diego City College

1313 Twelfth Avenue, San Diego, CA 92101 (619) 230-2400

Cooperative Education Work Experience
230-2495

September 3, 1992

David Richardson
Urban Corps
1864 National Avenue
San Diego CA 92113

Dear David,

I appreciate you taking time from your busy schedule to share with me your new program, "Interns in the Urban Corps." The program sounds challenging and could be a real learning experience for our students.

I shared our conversation with my Dean and he was very receptive to the internship concept. Dean Dark and I agreed that this would be an excellent opportunity for City College students to be a part of your program. Please include us in your internship and any other areas that you feel would be beneficial to students, the college, the community and the Urban Corps.

Sincerely,

Les Nimmo
Coordinator

LN:mc

cc: Dean Dark



Governing Board
Augie Boreno
Bill Blank, J.D.
G. Gordon Browning, D.M.D.
Jerry J. Griffith
Maria Neves-Perman

Joseph M. Conte
Superintendent/President

August 26, 1992

Mr. Dave Richardson
Educational Coordinator
Urban Corp of San Diego
1864 National Avenue
San Diego, CA 92113

Dear Mr. Richardson:

I am writing to inform you that your clients of Urban Corp can apply and enroll in the College's Cooperative Education (Work Experience) Program each semester that we offer courses.

If you have any questions, please call me at 482-6379.

Sincerely,

Greg R. Sandoval
Greg R. Sandoval, Assistant Dean
Student Support Services

GRS:mm

Correspo/UrbanCorp.892



San Diego Aerospace Museum

2001 PAN AMERICAN PLAZA, BALBOA PARK, SAN DIEGO, CA 92101
(619) 234-8291 FAX: (619) 233-4526

September 11, 1992

David B. Richardson
Education Development
Urban Corps of San Diego
1864 National Ave.
San Diego, CA 92113

Dear Mr. Richardson,

In keeping with our museum's educational responsibilities, we have been planning a training and education program to teach the skills needed in aircraft restoration and preservation. We have named this project "The Heritage Skills Program," and we would strive for San Diego Community College recognition for academic credits. Our students would be drawn from many sources, including young people interested in aircraft restoration, preservation or maintenance as a career.

We have numerous skilled craftsmen who would be well-qualified as instructors. It would be most helpful to have Urban Corps of San Diego's participation in the program as these young people have been helpful in our previous association with them. We can offer young people apprentice training in several of our departments and functional areas.

We do support the concept of apprentices and interns in the museum. It is completely in consonance with and amplifies our already extensive education program. We appreciate the opportunity to help our community and society by offering education and training to young people.

I look forward to a productive and long-lasting association in developing skills and leadership qualities in young people of the San Diego Urban Corps.

Sincerely,

Edwin D. McKellar, Jr.
Executive Director



THE CITY OF
SAN DIEGO

SAN DIEGO PUBLIC LIBRARY • 820 E STREET • SAN DIEGO, CALIFORNIA 92101

August 26, 1992

David B. Richardson
Urban Corps of San Diego
1864 National Avenue
San Diego, CA 92113

Dear David:

Thank you for organizing the informative meeting of August 7, 1992. Margaret Kazmer and I enjoyed meeting the other community members & appreciate their interest in the architectural drawings collection here at the library.

We at the San Diego Public Library are certainly interested in having the proposed inventory and condition report completed as part of the Urban Corps Historic Preservation Project. The opportunity to participate in this kind of community service project, to provide a vehicle for volunteer training, and cooperate with groups like the Balboa Art Conservation Center and the American Institute of Architects in conserving the historical resources for the whole community is exciting. There are other important collections in San Diego at the Railroad Museum etc. which could also benefit from the Urban Corps' pilot project at the Library. The description and preservation of these collections is of considerable importance to San Diego's history, and will make them available nationally also.

I look forward to continuing our association.

Sincerely,

A handwritten signature in cursive script that appears to read "Mary Allely".

Mary Allely
Section Supervisor
Special Collections

MA:mz





SAN DIEGO RAILROAD MUSEUM

1050 Kettner Blvd. San Diego, California 92101

General Information: (619) 697-7762

Development Office: (619) 595-3030

September 8, 1992

Mr. David Richardson
Education Development
URBAN CORPS OF SAN DIEGO
1864 National Avenue
San Diego, CA 92113

Dear David:

RE: Urban Corps of San Diego Historic Preservation Service
Training Program

As a result of preliminary meetings held with you, myself and the library staff, the San Diego Railroad Museum is extremely interested in the internship program being developed by the Urban Corps. These interns would be of great service to the Museum, assisting in various projects at our downtown San Diego office and library. Since we have already discussed mutual needs of archival conservation, I believe you have some idea the benefit both groups would receive from such a partnership.

We welcome the help you may provide to meet our public educational mandate. Long range goals for us could be developed to expand our youth education program to allow corpsmembers to go into schools to give railroad history or preservation presentations, to cite one example.

We are an all volunteer organization who has embarked on a program of expansion and the availability of a quality research facility on railroad heritage and, to a greater extent, San Diego's history. I believe that the on-the-job skills and work experience offered to corpsmembers would fit into your goals and objectives. I know it will provide much-needed, valuable assistance to our facility, staff and volunteers. Additionally, the exchange of experience and skills between our volunteers and young corpsmembers will foster good inter-generational relationships.

I look forward to hearing from you in the near future to discuss this concept and its implementation.

Sincerely,
Kay Carter
Kay B. Carter
Executive Director

THE
SAN DIEGO
AUTOMOTIVE
MUSEUM

September 4, 1992

David Richardson
San Diego Urban Corps
1864 National Ave.
San Diego, CA 92113

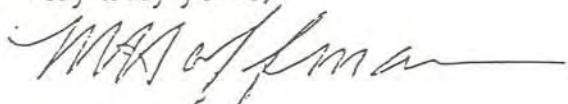
Dear David:

I would like to thank you for the time you took to describe the efforts of the San Diego Urban Corps and, more specifically, the Historical Preservation Service Training Program. After reviewing the literature you left, and discussing the matter with our Director, I am pleased to express our enthusiastic interest in your program.

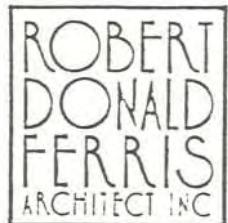
Our museum is currently in the process of exploring various educational "outreach" programs by which we might take an active role in the edification of San Diego youth. We recognize the unprecedented potential modern museums have as institutions that both educate *and* inspire.

We believe your approach to be very unique and deserving of a serious and concerted effort on our part toward its implementation. As we discussed on the phone, we are currently in the process of developing a proposed format for our museum's program. I appreciate the support you have, and continue to, offer and I look forward to working with you to make this very worthwhile program a reality at the San Diego Automotive Museum.

Very truly yours,



Mark Hoffman
Staff Associate Curator, Registrar



September 7, 1992

David Richardson
Education Development
Urban Corps of San Diego
1864 National Avenue
San Diego, Ca. 92113

Mr. Richardson:

I would like to commend you on the work you have done on your Historic Preservation Pilot Project. I believe that this endeavor is prime for our current economic circumstance and is a win-win situation for all who participate. This project allows many community groups to become involved in a common goal - the betterment of the community. As we have discussed earlier, there are many community groups that I am involved with, which I know would like to participate.

I feel that this project would be of great benefit to the community. Obviously, the young participant would gain a valuable skill. The training facility would benefit from a no-cost or low-cost apprentice. The groups and professionals involved would be assisting in the training of a potential future employee.

You have my support and involvement!

Sincerely,

Paul W. Johnson, A.I.A.



APPENDIX D

Commission on National and Community Service

Background

The National and Community Service Act of 1990 (Public Law 101-610, as amended) created the Commission on National and Community Service to provide program funds, training, and technical assistance to States and communities to develop and expand service opportunities. The Act is intended to:

- Renew the ethic of civic responsibility in the United States
- Encourage citizens, regardless of age, income, or ability, to engage in full- or part-time service
- Involve youth in programs that benefit the Nation and improve their own lives
- Enable young adults to make a sustained commitment to service by removing barriers created by high education costs, loan indebtedness, and the cost of housing
- Build on the network of existing Federal, State, and local programs and agencies
- Involve participants in activities that would not otherwise be performed by paid workers
- Generate additional volunteer service hours to help meet human, educational, environmental, and public safety needs, particularly those related to poverty
- Encourage institutions to volunteer their resources and energies and to encourage service among their members, employees, and their affiliates
- Identify successful and promising community service initiatives and disseminate information about them
- Discover and encourage new leaders

The COMMISSION is governed by a 27-member Board of Directors, including 21 members appointed by the President and confirmed by the Senate and six ex-officio members. The Commission's Chairperson is Paul N. McCloskey, Jr., and its Executive Director is Catherine Milton. The Commission can be reached at:

The Commission on National and Community Service

The National Press Building, Suite 428
529 14th Street, NW
Washington, D.C. 20045

Tel: (202) 724-0600
Fax: (202) 724-0608



Commission on National and Community Service

Program A total of \$73 million is available in fiscal year 1992. Commission funds will be available in four major categories:

Serve-America

This year, up to \$16.9 million is available for programs sponsored by schools or community-based agencies to involve school-aged youth in service to the community. Serve-America also supports programs that involve adult volunteers in the schools. Funding will be allocated to States submitting successful applications according to a formula. Funding will be granted on a competitive basis to Indian Tribes and to local applicants in States that do not apply.

Higher Education Innovative Projects for Community Service

Higher education institutions or public or private, non-profit, agencies working in partnership with those institutions can be awarded a total of up to \$5.6 million. Funds will support student community service projects or teacher training in service-learning methods.

American Conservation and Youth Service Corps Programs

Full-time, year-round, or summer conservation and youth service corps programs can receive up to \$22.5 million. These programs must involve teenagers and young adults, who receive job and skill training, living allowances, and scholarships. They may also include special corps members, such as senior citizens, who provide special skills to the program. Grants will be made on a competitive basis to States, Indian Tribes, and local applicants in States that do not apply.

Full-Time and Part-Time National and Community Service Programs

As many as 8 States and Indian tribes may share up to \$22.5 million in 1992 to test national service programs that will engage individuals ages 17 and older in full-time or part-time service. Participants will receive education or housing benefits upon completion of their term of service.

In addition, the Commission will provide training and technical assistance and may fund five other programs: demonstration projects for rural youth, employer-based retiree volunteer programs, governors' innovative service programs, a Peace Corps/VISTA training program, and a program that places Foster Grandparent programs in Head Start centers.

The types of service activities are broadly defined; participants may perform any educational, human, environmental, or public safety service project that will benefit the community.

Fact Sheet continued

Commission on National and Community Service

Funds and Applications

The majority of the funds available through the National and Community Service Act of 1990 will be distributed by States. Indian tribes are considered States under the Act and may submit applications directly to the Commission. Institutions of higher education also apply directly to the Commission.

States are strongly encouraged to establish a State Advisory Committee to assist in developing a Comprehensive State Service Plan and in completing the State application. The Advisory Committee should include representatives of State agencies and a variety of local and community-based organizations, labor, business, educators, parents, youth, senior citizens, and volunteer organizations. The application process is outlined below.

States

States may apply to the Commission for funds under:

- Subtitle B, Part I: Serve-America
- Subtitle B, Part II: Higher Education Innovative Projects for Community Service
- Subtitle C: American Conservation and Youth Corps
- Subtitle D: National and Community Service

States that receive funds from the Commission will then award grants to local organizations on a competitive basis according to criteria set forth in the Act. Subtitle B, Part I funds will be granted to States according to a formula based on Chapter 1 and school-age population. States may apply for funds under Subtitle B, Part II only in partnership with institutions of higher education or their consortia. Funds for Subtitle C and D will be awarded to States on a competitive basis.

Local Organizations

Local organizations may apply for funds under:

- Subtitle B, Part I: Serve-America
- Subtitle B, Part II: Higher Education Innovative Projects for Community Service
- Subtitle C: American Conservation and Youth Corps

A local group that wishes to apply for funds under these Subtitles will apply to their State lead agency, designated by their Governor's office, unless that State declines to apply for funds. If the State declines to apply for funds, local groups may apply directly to the Commission.

Institutions of Higher Education

Institutions of higher education, or consortia thereof, may apply for funds under:

- Subtitle B, Part II: Higher Education Innovative Projects for Community Service

These funds will be granted on a competitive basis.

Notification and Application Deadlines

States must notify the Commission on National and Community Service by February 3, 1992, if they intend to apply for funding. To find out whether your State intends to apply, call the Commission after February 3, 1992, at (202) 724-0600. All applications, State and local, will be due to the Commission on March 23, 1992, and grants will be made in May or June. Application forms will be available from the Commission office by late January. Requests for applications should be sent to the Commission at the address on the front of this Fact Sheet.

Technical Assistance

Meetings will be held to assist States and local leaders in the development of proposals:

- Washington, D.C.: January 27, 1992
- Dallas, TX: January 29, 1992
- San Francisco, CA: January 30, 1992

Board of Directors

Commission on National and Community Service

Joyce M. Black currently serves as the Executive Director of the Governor's Office for Voluntary Service in New York and as President of the National Assembly of Health and Social Welfare Organizations and of the Council of Families and Child Care Agencies in New York State. She is currently President of the Day Care Council of New York and founder and chairperson of the Mayor's Voluntary Action Center of New York City.

William J. Byron, S.J., is the President of The Catholic University of America in Washington, D.C., Founding Director of Bread for the World, and member of the Board of the Joint Commission for the Accreditation of Healthcare Organizations.

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Daniel J. Evans is the President of Daniel J. Evans Associates in Seattle and former Governor and Senator from Washington State.

Maria Hernandez Ferrier is the Executive Director for Special Programs in the Southwest Independent School District in San Antonio.

Frances Hesselbein is President and CEO of the Peter F. Drucker Foundation for Nonprofit Management in New York City and Chairperson of the Board of Governors of the Josephson Institute for the Advancement of Ethics. She serves on the Board of Directors of the Mutual of America Life Insurance Company and was Chief Executive Officer of the Girls Scouts of America.

Alan Khazel is Co-Founder and Co-Director of City Year in Boston. He serves on the Board of Directors of Share Our Strength (S.O.S.), a national hunger relief organization, and on the Board of Directors of the Massachusetts Youth Service Alliance.

Reatha Clark King is the President and Executive Director of the General Mills Foundation in Minneapolis. She served eleven years as President of Metropolitan State University of Minnesota.

Leslie Lenkowsky is President and CEO of the Hudson Institute in Indianapolis.

Jack A. MacAllister is Chairman of the Board and former CEO of U.S. West, Inc. He serves on the Board of Trustees of the University of Northern Colorado and on the Boards of Directors of the National Park Foundation and the St. Paul Companies.

Paul N. McCloskey, Jr., practices law in Menlo Park, California. Mr. McCloskey is a former member of Congress from the 12th Congressional District in California. During his time in Congress he was a strong supporter of national service legislation and currently serves as the chairperson of the Commission.

Wayne Meisel is Executive Director of the Corella and Bertram F. Bonner Foundation in Princeton.

Richard Frederick (Digger) Phelps was head basketball coach at the University of Notre Dame. He currently serves on the Citizen's Stamp Advisory Committee of the United States Postal Service.

George Wilcken Romney is the founding chairman of VOLUNTEER - the National Center and former Governor of Michigan. He currently serves on the Board of Directors of the Points of Light Foundation. He has been Chairman, President, and CEO of American Motors, Secretary of Housing and Urban Development, and Managing Director of the Automobile Manufacturing Association and Automotive Council for War Production.

Patricia Traugott Rouse is the co-founder of The Enterprise Foundation and serves as Secretary/Treasurer and member of the Board of Trustees. She is also a member of the Board of Directors of Jubilee Enterprise of Greater Washington, Inc. and of the National Low Income Housing Coalition.

Shirley Sachi Sagawa is Senior Counsel and Director of Family and Youth Policy for the National Women's Law Center and former Chief Counsel for Youth Policy to the Senate Labor and Human Resources Committee. She also serves as Public Policy chairperson of the Organization of Pan Asian American Women.

Johnnie Smith is Pastor and Founder of the Evangelistic Temple Church. He was elected Chairman of the South Carolina Appalachian Council of Governments Board of Directors and currently is Vice Chairman of the State Human Affairs Commission.

Glen W. White, Ph.D., is the Director of Training at the Research and Training Center on Independent Living and Research Associate at the Institute for Life Span Studies at the University of Kansas.

Gayle Edlund Wilson is the First Lady of the State of California. She is a current sustaining member and former President of the Junior League of San Diego.

Robert L. Woodson is President of the National Center for Neighborhood Enterprise in Washington, D.C.

Karen Susan Young is the Communications Director of the Campus Outreach Opportunity League in St. Paul.

Catherine Milton is the Executive Director of the Commission. She is founder and director of the Haas Center for Public Service at Stanford University. She was a key organizer of Campus Compact, a founding board member of Youth Service California, and the founder of K-12 service programs in Palo Alto, California. A former staff member of the U.S. Senate Special Committee on Aging, Ms. Milton has authored several books, including *Women in Policing*.

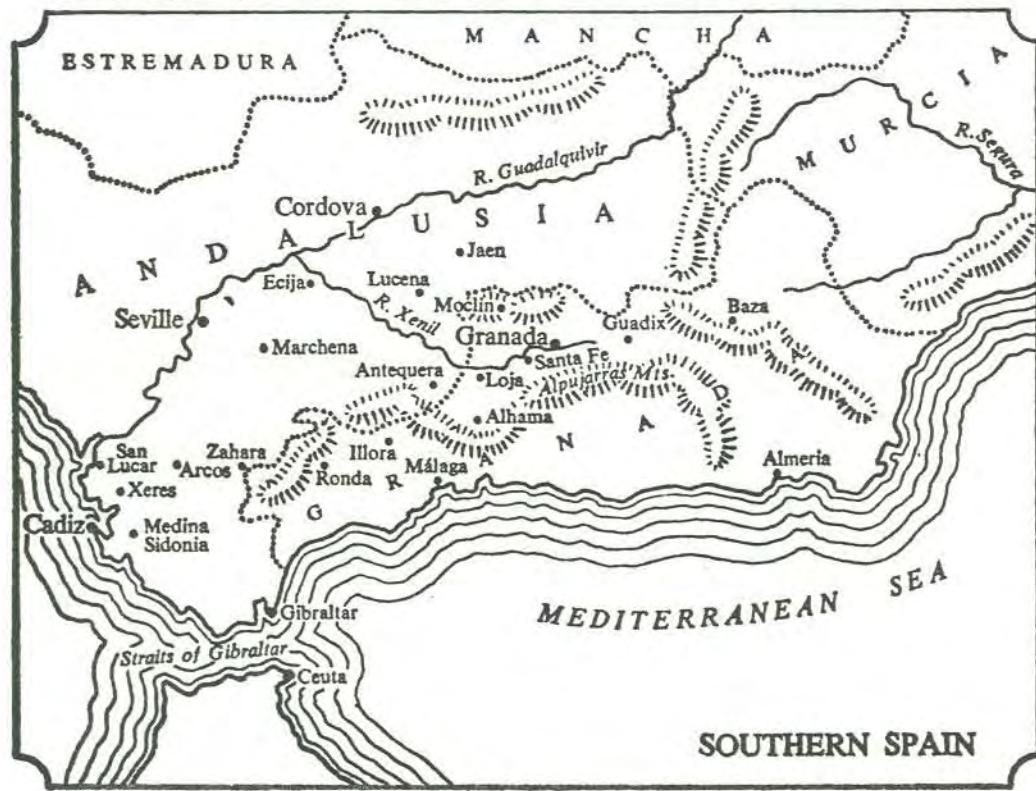
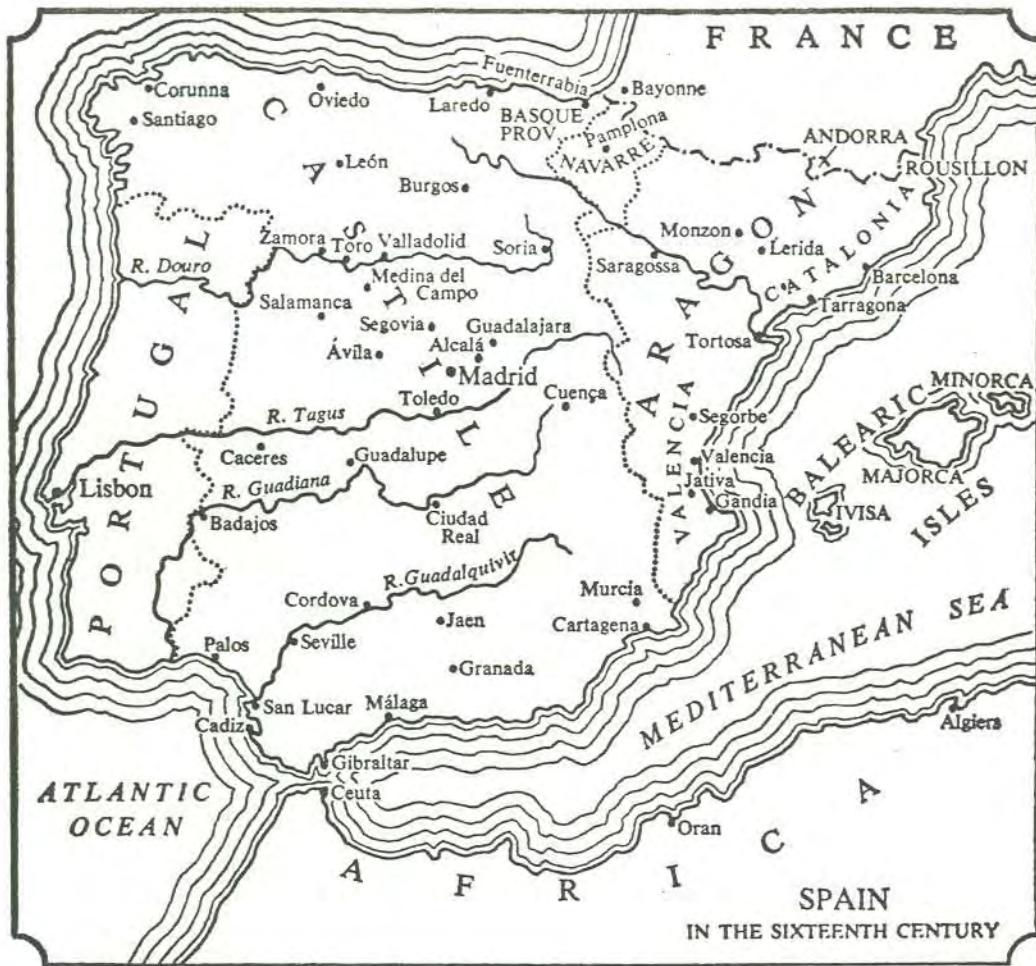


APPENDIX E

DATE	PLACE	NAME	PARK SITE	THEME	MEMORABLE FEATURE
1851	London	Great Exhibition	Hyde Park	Industrial progress	Crystal Palace
1888	Barcelona	Exposicio Universal de Barcelona	Citadel Park	Regional and international commerce	Arch of Triumph and the Umbracle
1889	Paris	Exposition Universelle	Champs de Mars	Centennial: French Revolution	Eiffel Tower
1893	Chicago	Columbian Exposition	Jackson Park	Fourth century: Columbus exploration	The "White City" and the Ferris wheel
1894	San Francisco	Midwinter Fair	Golden Gate Park	Promotion of West Coast climate and resources	Japanese Tea Garden and Music Concourse
1915	San Francisco	Panama Pacific International Exposition	Presidio and Marina Park	Opening of the Panama Canal	Palace of Fine Arts
1915	San Diego	Panama-California Exposition	Balboa Park	Opening of the Panama Canal	California Building and tower
1925	Paris	Exposition Internationale des Arts Decoratifs et Industriels Modernes	city center: both sides of the Seine	Art Deco movement	No permanent buildings or parks
1929	Barcelona	Exposicion International	Montjuic Park	Spanish industry, art and sport	National Palace
1929	Seville	Exposición Ibero-Americana	Maria Luisa Park	Iberian-American cultural bonds	Plaza de España
1933	Chicago	A Century of Progress Exposition	Burnham Park Harbor	Scientific progress	Science Gallery
1935	San Diego	California Pacific International Exposition	Balboa Park	Southern California styles and climate	Ford Museum and Old Globe Theater
1939	San Francisco	Golden Gate International	Treasure Island	Pacific Basin	Tower of the Sun and Pacific House
1992	Seville	Expo '92	Isla de Cartuja	Five hundred years: Columbus exploration	Monastery refurbishment: Santa Maria de las Cuevas



APPENDIX F





APPENDIX G

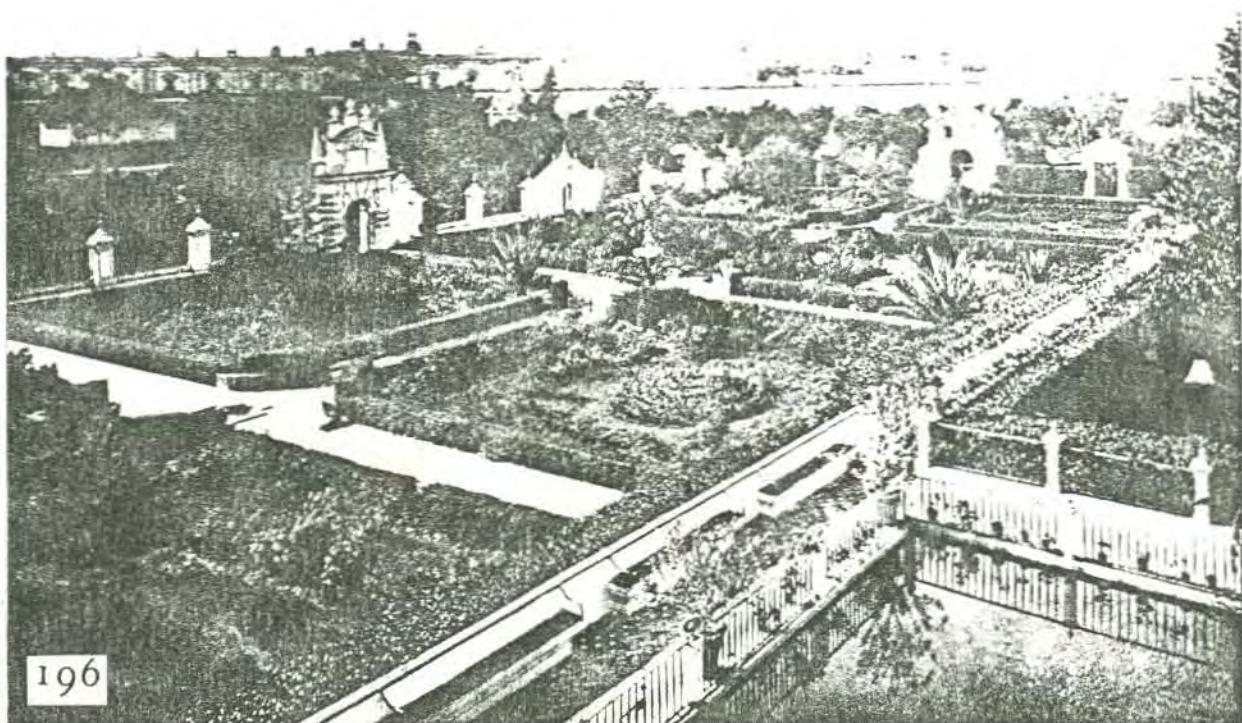


Photo Lacoste

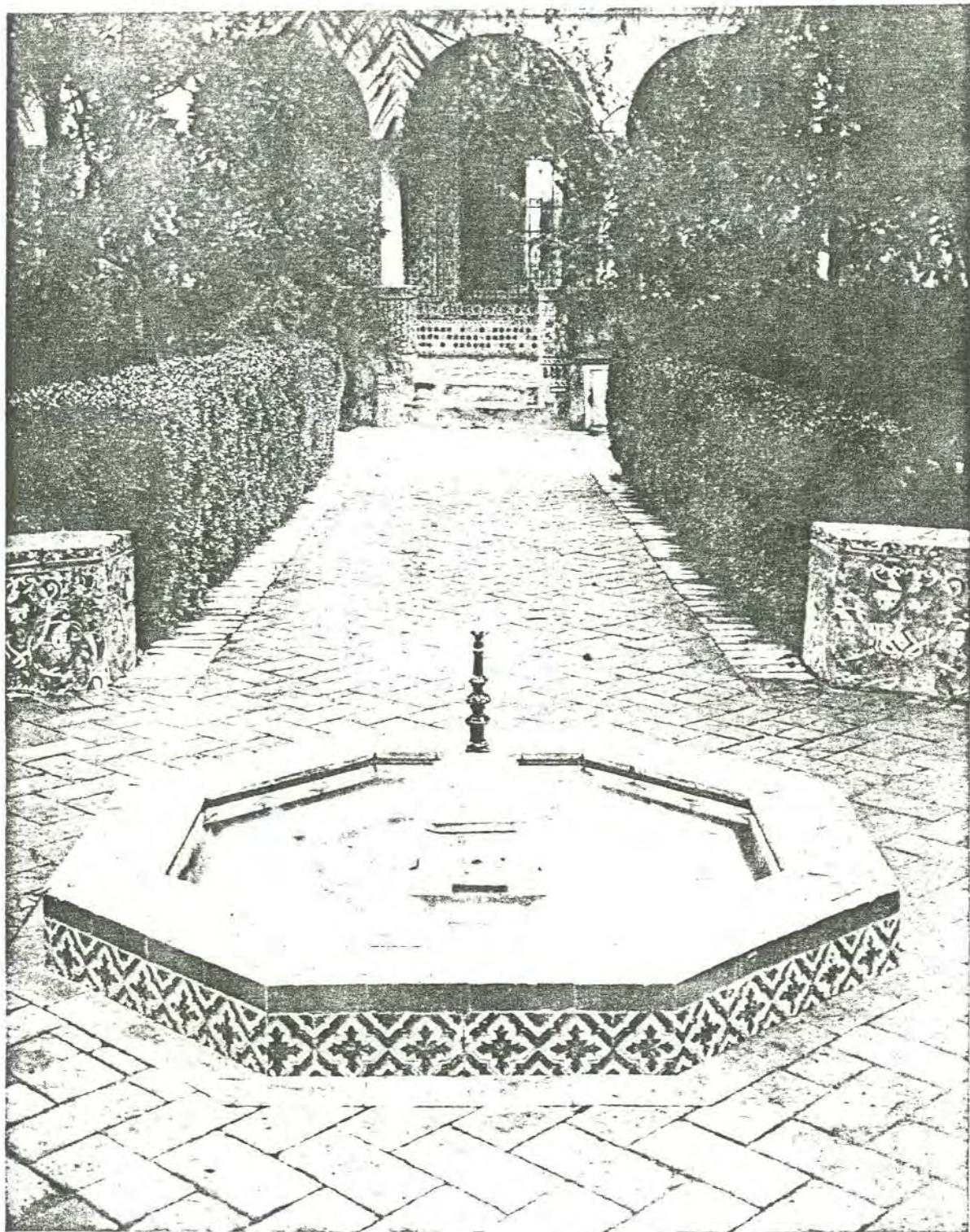
GENERAL VIEW OF THE ALCAZAR GARDENS TAKEN TWENTY-FIVE YEARS AGO BEFORE NEW TREES WERE PLANTED

*

(circa 1900)



GENERAL VIEW OF THE ALCAZAR GARDENS, SEVILLE, SHOWING THE WALL PROMENADES



GARDENS OF THE ALCAZAR, SEVILLE
Brick path leading to the pavilion of Charles V



APPENDIX H

SLIDE LIST AND LOCATION CODES

WEST FOUNTAIN

Elevations - Exterior

- 1• WF-EL-NW-X
- 2• WF-EL-NE-X
- 3• WF-EL-SE-X
- 4• WF-EL-SW-X

Elevations - Interior

- 5• WF-EL-NW-N
- 6• WF-EL-NE-N
- 7• WF-EL-SE-N
- 8• WF-EL-SW-N

Plan View

- 9• WF-PV-N
- 10• WF-PV-E
- 11• WF-PV-S
- 12• WF-PV-W

Plan View Floor

- 13• WF-PV-N-F
- 14• WF-PV-E-F
- 15• WF-PV-S-F
- 16• WF-PV-W-F

WEST SEATS

Elevations

- 17• WS-EL-NW-L (LEFT)
- 18• WS-EL-NW-C (CENTER)
- 19• WS-EL-NW-R (RIGHT)
- 20• WS-EL-NE-L
- 21• WS-EL-NE-C
- 22• WS-EL-NE-R
- 23• WS-EL-SE-L
- 24• WS-EL-SE-C
- 25• WS-EL-SE-R
- 26• WS-EL-SW-L
- 27• WS-EL-SW-C
- 28• WS-EL-SW-R

Plan View

- 29• WS-PV-NW
- 30• WS-PV-NE
- 31• WS-PV-SE
- 32• WS-PV-SW

SLIDE LIST AND LOCATION CODES

EAST FOUNTAIN

Elevations - Exterior

- 33 • EF-EL-N-X
- 34 • EF-EL-E-X
- 35 • EF-EL-S-X
- 36 • EF-EL-W-X

Elevations - Interior

- 37 • EF-EL-N-N
- 38 • EF-EL-E-N
- 39 • EF-EL-S-N
- 40 • EF-EL-W-N

Plan View

- 41 • EF-PV-N
- 42 • EF-PV-E
- 43 • EF-PV-S
- 44 • EF-PV-W

Plan View Floor

- 45 • EF-PV-N-F
- 46 • EF-PV-E-F
- 47 • EF-PV-S-F
- 48 • EF-PV-W-F

EAST SEATS

Elevations

- 49 • ES-EL-NW-L (LEFT)
- 50 • ES-EL-NW-C (CENTER)
- 51 • ES-EL-NW-R (RIGHT)
- 52 • ES-EL-NE-L
- 53 • ES-EL-NE-C
- 54 • ES-EL-NE-R
- 55 • ES-EL-SE-L
- 56 • ES-EL-SE-C
- 57 • ES-EL-SE-R
- 58 • EL-EL-SW-L
- 59 • ES-EL-SW-C
- 60 • ES-EL-SW-R

Plan View

- 61 • ES-PV-NW
- 62 • ES-PV-NE
- 63 • ES-PV-SE
- 64 • ES-PV-SW



APPENDIX I

7 PRESERVATION BRIEFS

The Preservation of Historic Glazed Architectural Terra-Cotta

de Teel Patterson Tiller



Technical Preservation Services Division

Heritage Conservation and Recreation Service

Glazed architectural terra-cotta was significant in the development of important architectural idioms in this country—specifically, the "Chicago School," the High Rise and the Historic or Beaux Arts styles. In fact, glazed architectural terra-cotta is one of the most prevalent masonry building materials found in the urban environment today (Fig. 1). Popular between the late 19th century and the 1930s, glazed architectural terra-cotta offered a modular, varied and relatively inexpensive approach to wall and floor construction. It was particularly adaptable to vigorous and rich ornamental detailing. However, with changing vogues in materials and architectural styles and rising production costs, glazed architectural terra-cotta fell into disfavor and disuse by the mid-20th century.

Today, information on the maintenance, rehabilitation and replacement of glazed architectural terra-cotta is limited, as are sources of new glazed architectural terra-cotta. This report, then, will discuss some of the major deterioration problems that commonly occur in historic glazed architectural terra-cotta, methods of determining the extent of that deterioration and recommendations for the maintenance, repair and replacement of the deteriorated historic material.

What is Terra-Cotta?

Generically, the broadest definition of terra-cotta refers to a high grade of weathered or aged clay which, when mixed with sand or with pulverized fired clay, can be molded and fired at high temperatures to a hardness and compactness not obtainable with brick. Simply put, terra-cotta is an enriched molded clay brick or block. The word *terra-cotta* is derived from the Latin word *terra-cocta*—literally, "cooked earth." Terra-cotta clays vary widely in color according to geography and types, ranging from red and brown to white.

Terra-cotta was usually hollow cast in blocks which were open to the back, like boxes, with internal compartment-like stiffeners called webbing (Fig. 2). Webbing substantially strengthened the load-bearing capacity of the hollow terra-cotta block without greatly increasing its weight.

Terra-cotta blocks were often finished with a glaze; that is, a slip glaze (clay wash) or an aqueous solution of metal salts was brushed or sprayed on the air-dried block before firing. Glazing changed the color, imitated different finishes, and produced a relatively impervious surface on the weather face of the final product. The glaze on the terra-cotta unit possessed excellent weathering properties when properly maintained. It had rich color and provided a hard surface that was not easily chipped off. Glazing offered unlimited and fade-resistant colors to the designer. Even today, few building

materials can match the glazes on terra-cotta for the range and, most importantly, the durability of colors.

Types of Terra-Cotta

Historically there are four types or categories of terra-cotta which have enjoyed wide use in the history of the American building arts: 1) brownstone, 2) fireproof construction, 3) ceramic veneer, and 4) glazed architectural.

Brownstone terra-cotta is the variety of this masonry material used earliest in American buildings (mid- to late 19th century). The brownstone type is a dark red or brown block either glazed (usually a slip glaze) or unglazed. It was hollow cast and was generally used in conjunction with other masonry in imitation of sandstone, brick or real brownstone. It is often found in the architecture of Richard Upjohn, James Renwick, H. H. Richardson and is associated with the Gothic and Romanesque Revival movements through such ornamental detailing as moldings, finials and capitals.

Fireproof construction terra-cotta was extensively developed as a direct result of the growth of the High Rise building in America. Inexpensive, lightweight and fireproof, these rough-finished hollow building blocks were ideally suited to span the I-beam members in floor, wall and ceiling construction (Fig. 3). Certain varieties are still in production today, although fireproof construction terra-cotta is no longer widely employed in the building industry.

Ceramic veneer was developed during the 1930s and is still used extensively in building construction today. Unlike traditional architectural terra-cotta, ceramic veneer is not hollow cast, but is as its name implies: a veneer of glazed ceramic tile which is ribbed on the back in much the same fashion as bathroom tile. Ceramic veneer is frequently attached to a grid of metal ties which has been anchored to the building.

Glazed architectural terra-cotta was the most complex development of terra-cotta as a masonry building material in this country. The hollow units were hand cast in molds or carved in clay and heavily glazed (often in imitation of stone) and fired. Sometimes called "architectural ceramics," glazed architectural terra-cotta was developed and refined throughout the first third of the 20th century and has been closely associated with the architecture of Cass Gilbert, Louis Sullivan, and Daniel H. Burnham, among others. Significant examples in this country include the Woolworth Building (1913) in New York City and the Wrigley Building (1921) in Chicago.

Late 19th and early 20th century advertising promoted the durable, impervious and adaptable nature of glazed archi-

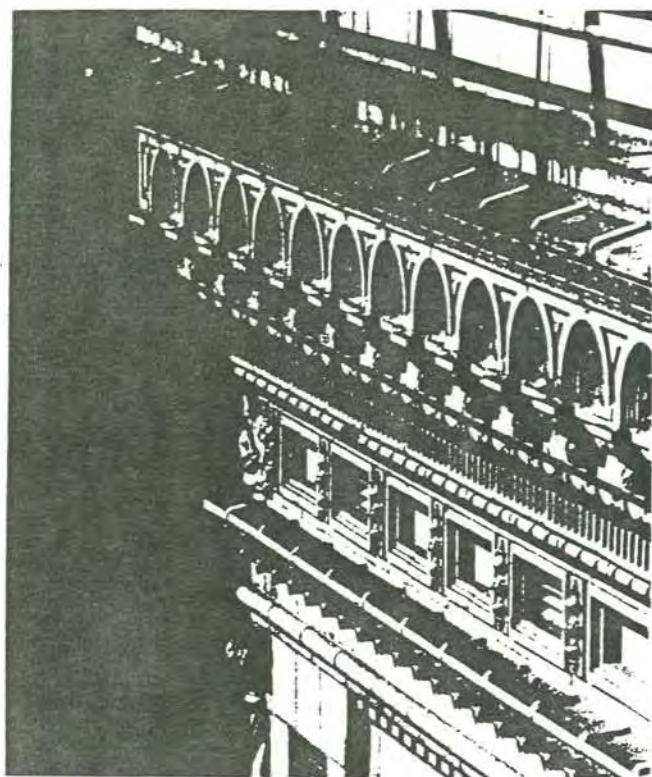


Figure 1. *Terra-Cotta Detailing.* Adaptable to every nuance of color, texture, and modeling, glazed architectural terra-cotta was ideally suited to satisfy the tastes of an eclectic age. Its popularity was, however, short lived; it endured only 30 or 40 years after its introduction as a building material late in the 19th century. (Larry Payne, Houston, Texas)

textural terra-cotta. It provided for crisp, vigorous modeling of architectural details as the molds were cast directly from clay prototypes without loss of refinement. Glazed architectural terra-cotta could accommodate subtle nuances of modeling, texture and color. Compared to stone, it was easier to handle, quickly set and more affordable to use. Thought to be fireproof and waterproof, it was readily adaptable to structures of almost any height. The cost of molding the clay, glazing and firing the blocks, when compared to carving

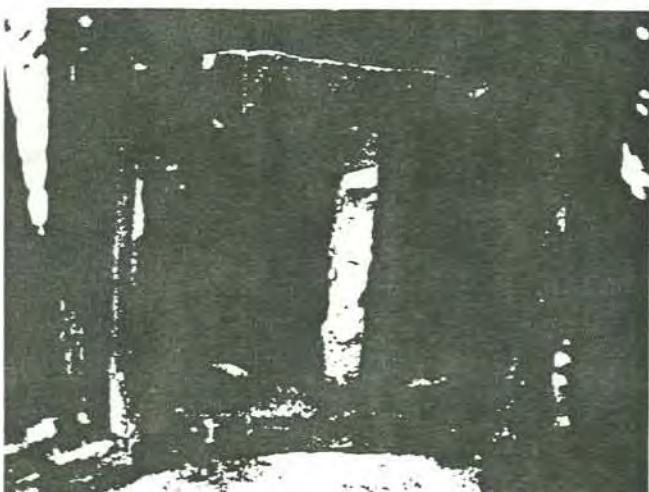


Figure 2. *Webbing.* Webbing, or the hollow internal compartment construction of glazed architectural terra-cotta blocks, made them inexpensive to produce, easy to handle and light in construction; these were significant factors in the popularity of the material in the first decades of this century.

stone, represented a considerable savings, especially when casts were used in a modular fashion—that is, repeated over and over again. Maintenance of the fired and glazed surface was easy; it never needed paint and periodic washings restored its original appearance.

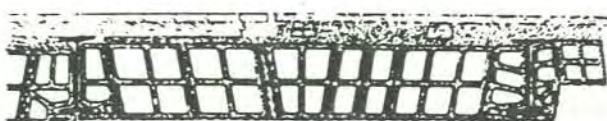
With the passage of time, many of the phenomenal claims of the early proponents of glazed architectural terra-cotta have proven true. There are many examples throughout this country that attest to the durability and permanence of this material. Yet present-day deterioration of other significant glazed architectural terra-cotta resources ultimately belie those claims. Why? Historically, the lack of foresight or understanding about the nature and limitations of the material has, in many instances, allowed serious deterioration problems to occur that are only now becoming apparent.

Characteristics of Glazed Architectural Terra-Cotta as a Building Material

Glazed architectural terra-cotta has many material properties similar to brick or stone. It also has many material properties radically different from those traditional masonry materials. It is those differences which must be considered for a better understanding of some of the material characteristics of glazed architectural terra-cotta when it is used as a building material.

Difficult to identify: Glazed architectural terra-cotta probably comprises one of the largest if not the largest constituent material in some of our urban environments today. However, the infinite varieties of glazing have hidden this fact from the casual observer. One of the attractive features of glazed architectural terra-cotta in its time was that it could be finished (glazed) in exact imitation of stone. In fact, many building owners and architects alike are often surprised to discover that what they presumed to be a granite or limestone building is glazed architectural terra-cotta instead.

Two separate systems: Historically, glazed architectural terra-cotta has been used in association with two specific and very different types of building systems: as part of a traditional *load-bearing* masonry wall in buildings of modest height, and as a *cladding material* in High Rise construction. As cladding, glazed architectural terra-cotta often utilized an extensive metal anchoring system to attach it or to "hang it" onto a wall framing system or superstructure (Fig. 4). In the first instance the anchoring was limited; in the second, the anchoring was often extensive and complex. Likewise, in the first instance, deterioration has generally been limited. However, where glazed architectural terra-cotta was used as clad-



Section Through Typical Arch



Perspective of Typical Arch

Figure 3. *Fireproof construction terra-cotta.* Perspective and section through fireproof construction terra-cotta and I-beam detailing in industrial floor construction. (Detail, "Sweets" Industrial Catalogue of Building Construction, 1906)

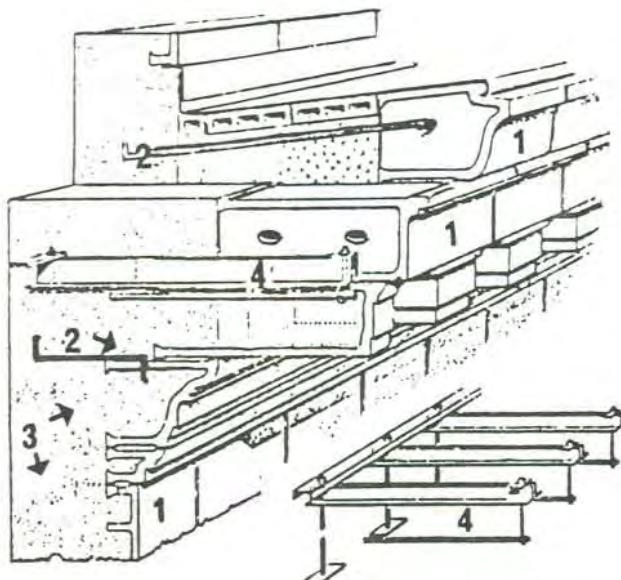


Figure 4. Typical Construction Detail of Glazed Architectural Terra-Cotta Ornament. Construction detailing was often complex. The terra-cotta units (1) which were laid in mortar were fitted with holes or slots to receive the metal anchors (2) (often called "Z" straps or "light iron") which were often fitted directly to the building frame. Masonry backfill (3) (either brick or poured cement) was laid between the terra-cotta units, with the building frame encasing the metal anchor. Overhanging or protruding elements were further secured by metal dowels or outriggers (4). (Detail, Architectural Terra Cotta, Charles E. White, Jr., 1920)

ding, particularly in high rise construction, present-day deterioration and failure are often severe.

Complexity of deterioration: Deterioration is, by nature of the design, infinitely complex—particularly when glazed architectural terra-cotta has been used as a cladding material. Deterioration creates a "domino"-like breakdown of the whole system: glazed units, mortar, metal anchors, and masonry backfill. In no other masonry system is material failure potentially so complicated.

Poor original design: The root of deterioration in glazed architectural terra-cotta systems often lies in a misapplication of the material. Historically, glazed architectural terra-cotta was viewed as a highly waterproof system needing neither flashing, weep holes nor drips. This supposition, however, has proved to be untrue, as serious water-related failure was evident early in the life of many glazed architectural terra-cotta clad or detailed buildings.

Common Deterioration Problems

No one case of deterioration in glazed architectural terra-cotta is ever identical to another owing to the infinite number of variations with the material: original manufacture, original installation inconsistencies, number of component parts, ongoing repairs or the various types and sources of deterioration. However, certain general statements may be made on the nature of glazed architectural terra-cotta deterioration.

Material failure can most commonly be attributed to water-related problems. However, less frequent though no less severe causes may include: faulty original craftsmanship, which is often cited but hard to determine; stress-related deterioration; damage caused by later alterations and additions; or inappropriate repairs.

Water-related deterioration: As with most building conservation and rehabilitation problems, water is a principal source of deterioration in glazed architectural terra-cotta. Terra-cotta systems are highly susceptible to such complex water-

related deterioration problems as glaze crazing, glaze spalling and material loss, missing masonry units and deteriorated metal anchoring, among others.

Crazing, or the formation of small random cracks in the glaze, is a common form of water-related deterioration in glazed architectural terra-cotta. When the new terra-cotta unit first comes from the kiln after firing, it has shrunken (dried) to its smallest possible size. With the passage of time, however, it expands as it absorbs moisture from the air, a process which may continue for many years. The glaze then goes into tension because it has a lesser capacity for expansion than the porous tile body; it no longer "fits" the expanding unit onto which it was originally fired. If the strength of the glaze is exceeded, it will crack (craze) (Fig. 5). Crazing is a process not unlike the random hairline cracking on the surface of an old oil painting. Both may occur as a normal process in the aging of the material. Unless the cracks visibly extend into the porous tile body beneath the glaze, crazing should not be regarded as highly serious material failure. It does, however, tend to increase the water absorption capability of the glazed architectural terra-cotta unit.

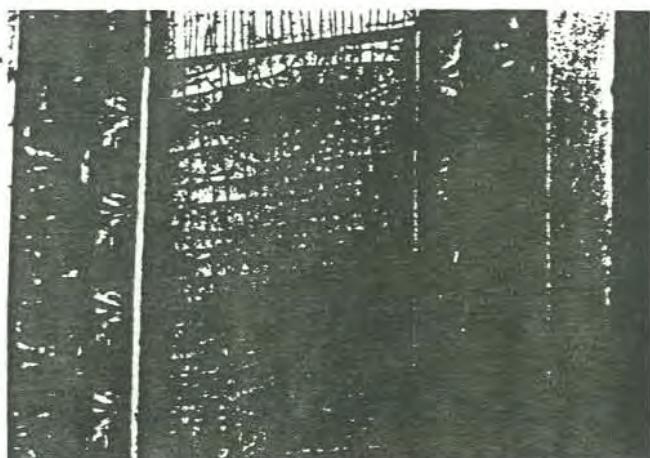


Figure 5. Crazing. Water and air-borne moisture entering the glazed architectural terra-cotta causes expansion of the porous clay body which increases its volume. This, in turn, is sufficient to upset the "fit" of the glaze and to make it shatter, commonly called crazing.

Spalling, the partial loss of the masonry material itself, is, like crazing, caused by water and is usually a result not only of air-borne water but more commonly of water trapped within the masonry system itself. Trapped water is often caused by poor water detailing in the original design, insufficient maintenance, rising damp or a leaking roof. In most cases, trapped water tends to migrate outward through masonry walls where it eventually evaporates. In glazed architectural terra-cotta, the water is impeded in its journey by the relatively impervious glaze on the surface of the unit which acts as a water barrier. The water is stopped at the glaze until it builds up sufficient pressure (particularly in the presence of widely fluctuating temperatures) to pop off sections of the glaze (glaze spalling) or to cause the wholesale destruction of portions of the glazed architectural terra-cotta unit itself (material spalling).

Glaze spalling may appear as small coin-size blisters where the glaze has ruptured and exposed the porous tile body beneath (Fig. 6). This may occur as several spots on the surface or, in more advanced cases of deterioration, it may result in the wholesale disappearance of the glaze. Spalling of the glaze may also be symptomatic of deterioration (rusting) of the internal metal anchoring system which holds the terra-cotta units together and to the larger building structure. The increase in volume of the metal created by rusting creates increased internal pressures in the terra-cotta unit which, in

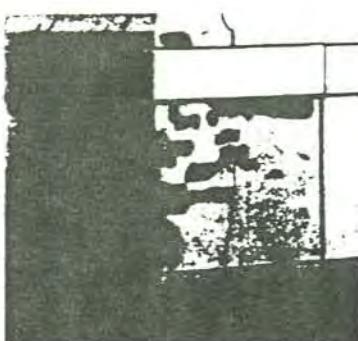


Figure 6. Glaze Spalling. Blistering of the glaze, like crazing, is the result of the increase in water in the porous clay body and the subsequent destruction of the glaze as a result of water migration and pressure. Glaze spalling may also be caused by deterioration of metal anchors behind the terra-cotta unit.

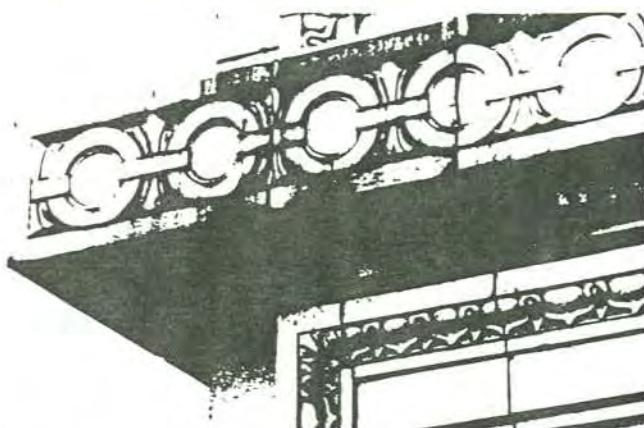


Figure 7. Material Spalling. Excessive expansion of the porous tile body caused by water and freezing temperatures produces major material spalling, a situation often difficult to repair.

turn, may spall the glaze, or in more extreme cases, cause material spalling.

Material spalling is a particularly severe situation. Not only is the visual integrity of the detailing impaired, but a large area of the porous underbody, webbing and metal anchoring is exposed to the destructive effects of further water entry and deterioration (Fig. 7). Both glaze and material spalling must be dealt with as soon as possible.



Figure 8. Deterioration of Exposed Detailing. Exposed or freestanding terra-cotta detailing (parapets, urns, balusters, etc.) have traditionally been subject to the most severe vicissitudes of deterioration as a result of freezing temperatures and water. (Colorado State Historic Preservation Office)

Missing units is a serious situation which particularly plagues architectural terra-cotta systems. Unlike brick or stone, damaged glazed architectural terra-cotta is exceedingly difficult to replace. New production is extremely limited. Missing units create gaps which increase the structural load on the remaining pieces and also permit water to enter the system. Exposed or freestanding glazed architectural terra-cotta detailing (balusters, urns, parapet walls, etc.) are particularly susceptible to extensive loss of material (Fig. 8). These elements face the most severe vicissitudes of water- and temperature-related deterioration in direct proportion to the extent of their exposure. The replacement of missing units should be a high priority work item in the rehabilitation of glazed architectural terra-cotta.

Deterioration of metal anchoring: Deteriorated anchoring systems are perhaps the most difficult form of glazed architectural terra-cotta deterioration to locate or diagnose. Often, the damage must be severe and irreparable before it is noticed on even the most intense "prima facie" examination. Water which enters the glazed architectural terra-cotta system can rust the anchoring system and substantially weaken or completely disintegrate those elements. Where water has been permitted to enter the system, some deterioration has more than likely taken place. Partial deterioration results in staining and material spalling. Total deterioration and the lack of any anchoring system may result in the loosening of the units themselves, threatening the architectural or structural integrity of the building. Recently, falling glazed architectural terra-cotta units have become a serious safety concern to many building owners and municipal governments (Fig. 9). Early detection of failing anchoring systems is exceedingly difficult.

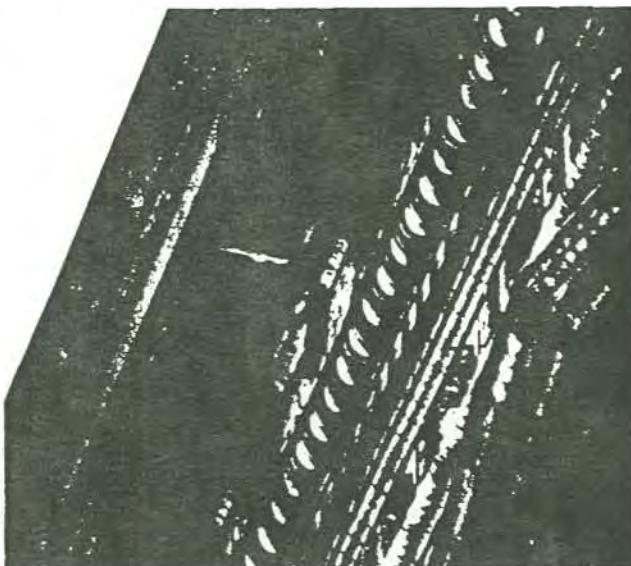


Figure 9. Deterioration of Metal Anchoring and Masonry Backfill. Trapped water may deteriorate masonry backfill or rust metal anchoring causing overhanging architectural elements to loosen and drop from the building. This is particularly true when unmaintained roof drainage systems fail and soak the masonry system. Note the exposed metal anchoring.

Deterioration of mortar and other adjacent materials: Deteriorated mortar has always been a key to the survival or failure of any masonry system. This is particularly true with glazed architectural terra-cotta. In recognition of the fragile nature of the system, the need for insuring a relatively dry internal system is important. Sound mortar is the "first line" of defense in terra-cotta systems. It is a maintenance "must." Deteriorated mortar joints are a singularly culpable source of water and, therefore, of deterioration. Mortar deterioration may result from improper original craftsmanship or air-

and water-borne pollution. More often, however, lack of ongoing maintenance is mainly responsible. Deteriorated mortar should not be overlooked as a major source of glazed architectural terra-cotta failure.

The deterioration of materials adjoining the glazed architectural terra-cotta (flashing, capping, roofing, caulking around windows and doors) bears significant responsibility in its deterioration. When these adjoining materials fail, largely as a result of lack of maintenance, water-related deterioration results. For instance, it is not uncommon to find wholesale terra-cotta spalling in close proximity to a window or doorway where the caulking has deteriorated.

Stress-related deterioration: Stress-related deterioration of glazed architectural terra-cotta frequently occurs in high rise buildings. The evolution of stress relieving details (flexible joints, shelf angles, etc.) occurred late in the development of American building construction. Consequently, most early continuously clad High Rise buildings (c. 1900-1920s) had little or no provisions for normal material and building movement in their original design. The development of large stress-related cracks or wholesale material deterioration is often caused by unaccommodated building-frame shortening under load, thermal expansion and contraction of the façade and moisture expansion of the glazed architectural terra-cotta units themselves (Fig. 10). Cracks running through many units or stories or large areas of material deterioration often indicate stress-related problems. This sort of deterioration, in turn, permits significant water entry into the terra-cotta system.

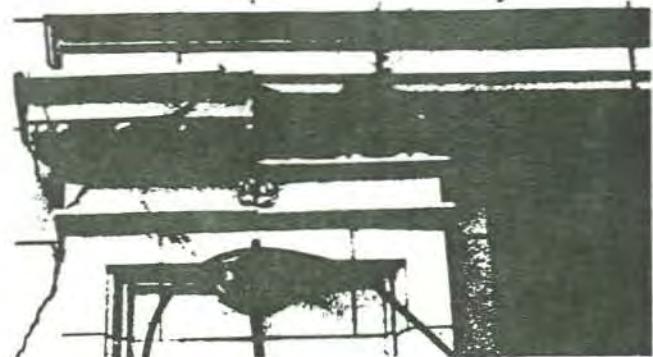


Figure 10. Structural Cracking. Structural cracking, whether static (nonmoving) or dynamic (moving or active), should be caulked to prevent water entry into the glazed architectural terra-cotta system. Note the exposed webbing.

Inappropriate repairs: Inappropriate repairs result because using new terra-cotta for replacement of deteriorated or missing glazed architectural terra-cotta has generally been impractical. Repairs, therefore, have traditionally been made in brick or cementitious build ups of numerous materials such as stucco or fiberglass. Some materials are appropriate temporary or permanent replacements, while others are not. (These issues are discussed at a later point in this report.) However, improper anchoring or bonding of the repair work or visual incompatibility of repairs have themselves, with the passage of time, become rehabilitation problems: replacement brick that is pulling free, cement stucco that is cracking and spalling, or a cement or bituminous repairs that are not visually compatible with the original material.

Alteration damage: Alteration damage has occurred as a result of the installation of such building additions as signs, screens, marquees or bird proofing. These installations often necessitated the boring of holes or cutting of the glazed architectural terra-cotta to anchor these additions to the building frame beneath. As the anchoring or caulking deteriorated, or as these elements were removed in subsequent renovation

work, these holes have become significant sources of water-related damage to the glazed architectural terra-cotta system.

Deterioration Inspection and Analysis

Certain deterioration in glazed architectural terra-cotta may be on the building surface and patently obvious to the casual observer—crazing, spalling, deterioration of mortar joints. Other deterioration may be internal or within the masonry system and hard to determine—deterioration of anchoring, deterioration behind the glaze, crumbling of internal webbing. *Prima facie*, "first inspection," examination may indicate surface deterioration problems while not revealing others. This demonstrates one of the most frustrating aspects of dealing with deteriorated glazed architectural terra-cotta: that there are two systems or levels of deterioration, one which is visible and the other which is not.

Material failure in glazed architectural terra-cotta is necessarily complex. For this reason, it is generally advised that the examination and repair of this material should be the responsibility of an experienced professional. Few restorationists have experience in the inspection, repair and replacement of glazed architectural terra-cotta. This is certainly never the province of the amateur or the most well-intentioned but inexperienced architect or engineer. There are some methods of internal and external inspection and analysis which are relatively simple to the trained professional. Other methods, however, are expensive, time consuming, and only in the experimental stage at this writing. These all generally preclude the use of anyone but an experienced professional.

Preliminary cleaning: Before a terra-cotta building is analyzed for deterioration, it is often advisable, but not always necessary, to clean the surface of the material. This is particularly true when the material has been exposed to the vicissitudes of heavy urban pollution. While most building materials are cleaned for "cosmetic" purposes, the cleaning of glazed architectural terra-cotta for the purpose of inspection and analysis may be advised. Dirt on glazed architectural terra-cotta often hides a multitude of problems. It is only with cleaning that these problems become obvious. Recommended cleaning procedures are covered later in the report.

Methods of inspection:

Prima facie analysis is the unit by unit, first-hand, external inspection of the glazed architectural terra-cotta building surface. Special note of all visible surface deterioration (staining, crazing, spalling, cracking, etc.) should be made on elevation drawings. Binoculars are often used where cost, height, or inaccessibility prevent easy inspection. However, much deterioration may go unnoticed unless scaffolding or window-washing apparatus is used in a true "hands on" inspection of each unit of the façade.

Tapping, a somewhat inexact method of detection of internal deterioration is, nevertheless, the most reliable inspection procedure presently available. Quite simply, tapping is the striking of each unit with a wooden mallet. When struck, an undamaged glazed architectural terra-cotta unit gives a pronounced ring, indicating its sound internal condition. Conversely, deteriorated units (i.e., units which are failing internally) produce a flat, hollow sound. Metal hammers are never to be used, as they may damage the glazed surface of the unit. Extensive experience is the best teacher with this inspection method.

Infrared scanning is only in the experimental stage at this time, but its use seems to hold great promise in locating deteriorated internal material in terra-cotta. All materials emit heat—heat which can be measured in terms of infrared light. While infrared light cannot be seen by the human eye, it can be measured by infrared scanning. Infrared photography, a kind of infrared scanning, has been of particular use in detecting sources of heat loss in buildings in recent years.

Broken or loose internal terra-cotta pieces have a less firm attachment to the surrounding firm or attached pieces and, therefore, have different thermal properties, i.e., temperatures. These temperature differences become evident on the infrared scan and may serve as a fair indication of internal material deterioration in terra-cotta.

Sonic testing has been successfully used for some time to detect internal cracking of concrete members. In the hands of an experienced operator, there are conditions where it can detect internal failure in glazed architectural terra-cotta. Sonic testing registers the internal configuration of materials by penetrating the material with sound waves and reading the patterns that "bounce back" from the originating source of the sound. Readings at variance with those from undeteriorated material might indicate collapsed webbing or pools of water in the interior of the terra-cotta unit.

Metal detection is a nondestructive and generally useful way of locating the position of internal metal anchoring. Metal detectors indicate the presence of metals by electro-magnetic impulses. These impulses are transmitted onto an oscilloscope where they may be seen or they are converted to sound patterns which may be heard by the operator. Original drawings are eminently useful in predicting where internal metal anchoring should be. Metal detectors can confirm that indeed they are still there. Without original drawings, the contractor or architect can still locate the metal anchoring, however. No reading where an anchor would be expected could indicate a missing anchor or one that has seriously deteriorated. The information produced by metal detection is, at best, only rough. However, it is the most viable way of locating the internal metal anchoring without physically removing, thus irreparably damaging, the glazed architectural terra-cotta units themselves.

Laboratory analysis may be carried out on samples of removed original material to find glaze absorption, permeability or glaze adhesion, or to evaluate material for porosity. These tests are useful in determining the present material characteristics of the historic glazed architectural terra-cotta and how they may be expected to perform in the future.

• Maintenance, Repair and Replacement

Deterioration in glazed architectural terra-cotta is, by definition, insidious in that the outward signs of decay do not always indicate the more serious problems within. It is, therefore, of paramount importance that the repair and replacement of deteriorated glazed architectural terra-cotta not be undertaken unless the causes of that deterioration have been determined and repaired. As mentioned before, one of the primary agents of deterioration in glazed architectural terra-cotta is water. Therefore, water-related damage can be repaired only when the sources of that water have been eliminated. Repointing, caulking and replacement of missing masonry pieces are also of primary concern. Where detailing to conduct water in the original design has been insufficient, the installation of new flashing or weep holes might be considered.

Where stress-related or structural problems have caused the deterioration of glazed architectural terra-cotta, the services of a structural engineer should be sought to mitigate these problems. This may include the installation of relieving joints, shelf angles or flexible joints. In any case, stress-related and structural deterioration, like water-related deterioration, must be stopped before effective consolidation or replacement efforts may begin.

Cleaning: The successful cleaning of glazed architectural terra-cotta removes excessive soil from the glazed surface without damaging the masonry unit itself. Of the many cleaning materials available, the most widely recommended are water, detergent, and a natural or nylon bristle brush. More

stubborn pollution or fire-related dirt or bird droppings can be cleaned with steam or weak solutions of muriatic or oxalic acid.

A note of caution: Any acids, when used in strong enough solutions, may themselves deteriorate mortar and "liberate" salts within the masonry system, producing a situation called efflorescence. For further information on this situation, refer to: "Preservation Briefs I: The Cleaning and Waterproof Coating of Masonry Buildings," Heritage Conservation and Recreation Service, Department of the Interior, Washington, D.C.

Commercial cleaning solutions may be appropriate but probably are not necessary when water and detergent will suffice. There are, however, certain cleaning techniques for glazed architectural terra-cotta which are definitely *not* recommended and which would damage the surface of the material. These include: all abrasive cleaning measures (especially sandblasting), the use of strong acids (particularly fluoride-based acids), high-pressure water cleaning and the use of metal bristle brushes. All of these techniques will irreparably harm the glaze in one fashion or another and subsequently expose the porous tile body to the damaging effects of water.

It is important to remember that glazed architectural terra-cotta was designed to be cleaned cheaply and easily. This, in fact, was one of its major assets and was much advertised in the selling of the material early in this century.

Waterproofing: The covering of crazed glazing (see Fig. 5) with waterproof coatings is the subject of an on-going controversy today. The question involves whether or not the micro-cracks conduct substantial amounts of water into the porous tile body. Tests indicate that the glaze on new unexposed terra-cotta is itself not completely waterproof. Some testing also indicates that most crazing on historic glazed terra-cotta does not substantially increase the flow of moisture into the porous tile body when compared to new material. Excessive and serious crazing is, however, an exception and the coating of those areas on a limited scale may be wholly appropriate.

In an effort to stem water-related deterioration, architects and building owners often erroneously attribute water-related damage to glaze crazing when the source of the deterioration is, in fact, elsewhere: deteriorated caulking, flashing, etc. The waterproof coating of glazed architectural terra-cotta walls may cause problems on its own. Outward migration of water vapor normally occurs through the mortar joints in these systems. The inadvertent sealing of these joints in the wholesale coating of the wall may exacerbate an already serious situation. Spalling of the glaze, mortar, or porous body will, more than likely, result.

Repointing: Repointing of mortar which is severely deteriorated or improperly or infrequently maintained is one of the most useful preservation activities that can be performed on historic glazed architectural terra-cotta buildings. On-going and cyclical repointing guarantees the long life of this material. Repointing should always be carried out with a mortar which has a compressive strength (measured in p.s.i.) *lower* than the adjacent masonry unit. Hard (Portland cement) or coarsely screened mortars may cause point loading and/or prevent the outward migration of the water through the mortar joints, both of which ultimately damage the terra-cotta unit. Repointing with waterproof caulking compounds or similar waterproof materials should never be undertaken because, like waterproof coatings, they impede the normal outward migration of moisture through the masonry joints. Moisture then may build sufficient pressure behind the waterproof caulk and the glaze on the terra-cotta to cause damage to the unit itself.

Repair of glaze spalling: Glaze spalling is also a highly culpable source of water-related deterioration in glazed archi-

tectural terra-cotta. It is important to coat or seal these blistered areas (see Fig. 6) and to prevent further entry of water into the system by this route. All loose or friable material should be removed. This may be done easily by hand; chisels or similar small tools are most effective. The exposed material is then painted over. At this time, no permanently effective reglazing materials are available. However, there are several acrylic-based proprietary products and masonry paints which can be used effectively to protect these exposed areas, thus preventing the entry of water. These materials are effective for 5 to 7 years and can be reapplied. They also can be tinted to approximate closely the original glaze color.

Repair of minor material spalling: Minor material spalling, where visual or cosmetic considerations are negligible, should be treated in a manner similar to glaze spalling damage. That is, areas where small portions of the body and glaze have spalled and which are far removed from close scrutiny (i.e., detailing on entablatures, upper story windows, etc.) are best remedied by painting with a masonry paint or an acrylic-based proprietary product. Units on which material spalling is easily observed (on the street level, door surrounds, etc.), and on which visual integrity is a consideration, may be better replaced. Patching is not appropriate. Stucco-like or cementitious build-ups are difficult to form satisfactorily, safely and compatibly in situ to replace missing pieces of glazed architectural terra-cotta. Cementitious repairs never satisfactorily bond to the original material. The differential expansion coefficients of the two materials (the repair and the original) preclude a safe, effective and long-term attachment.

Repair of major spalling: Glazed architectural terra-cotta units, which have spalled severely thereby losing much of their material and structural integrity in the wall, should be replaced. Partial in situ repair will not be long lasting and may, in fact, cause complicated restoration problems at a later date. Appropriate methods of replacement are discussed at a later point in this report.

Temporary stabilization: Stabilization measures are necessary when deterioration is so severe as to create a situation where pieces of glazed architectural terra-cotta may fall from the building. This is a particular concern with greatly exposed detailing: cornices, balconies, balustrades, urns, columns, buttresses, etc. Restoration work on these pieces is expensive and often must be carried on over a period of time. Unstable terra-cotta pieces are often removed or destroyed in lieu of such measures. This is particularly true in areas of heavy traffic-related vibrations or in earthquake zones. There are, however, less severe measures which may be employed on a temporary basis. Substantial success has been achieved in securing unstable glazed architectural terra-cotta pieces with metal strapping and nylon net (Fig. 11). While these measures should not be seen as permanent preservation solutions, they do offer temporary alternatives to the wanton destruction of significant glazed architectural terra-cotta detailing in the name of public safety and local code compliance.

Repair of addition and structural damage: Holes, sign anchors, slots for channel steel, or structural cracking in the surface of glazed architectural terra-cotta cladding should be permanently sealed with a material that will expand with the normal dynamics of the surrounding material, yet effectively keep water out of the system. Any one of a number of commercially available waterproof caulking compounds would be appropriate for this work. Holes and static (nonmoving) cracks may be caulked with butyl sealants or acrylic latex caulk. For dynamic (moving or active) cracks, the polysulfide caulk is most often used, although others may be safely employed. It is, however, important to remember that these waterproof caulking compounds are not viable repointing materials and should not be used as such.

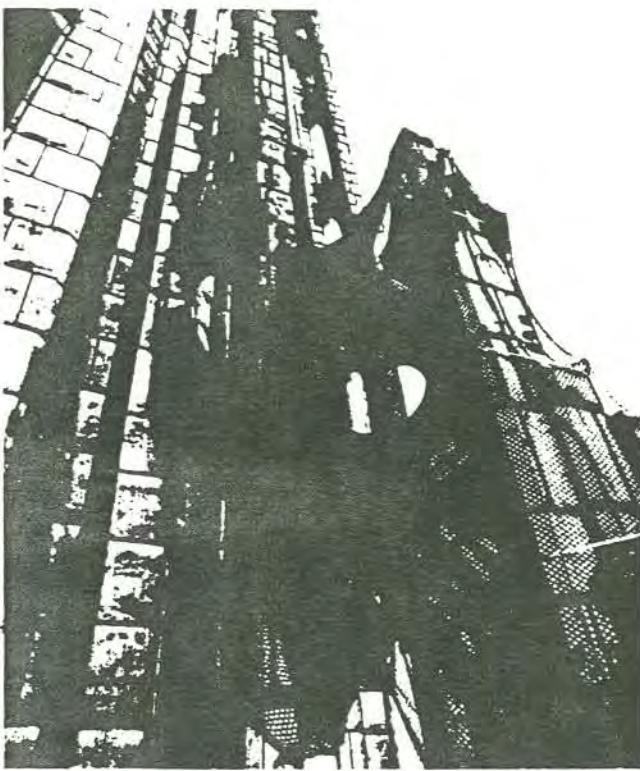


Figure 11. Temporary Stabilization Measures. Falling glazed architectural terra-cotta detailing has become a source of concern, particularly in dense urban areas and locations of high seismic activity. Nylon netting and metal strapping, while not seen as permanent preservation measures, do offer a temporary alternative to the removal of these elements.

Temporary replacement: Temporary replacement measures should be implemented when missing units are scheduled to be replaced but work cannot be undertaken immediately. Lengthy delivery time, prorating of work or seasonal considerations may postpone replacement work. Severe deterioration should at least be ameliorated until work can begin. Temporary repointing, removal and saving of undamaged units to be reset later, or the temporary installation of brick infill to retard further deterioration might be considered.

Removing earlier repairs: Removing earlier repairs may be necessary when the work has either deteriorated or has become visually incompatible. Cementitious stucco, caulkings with black bituminous compounds or brick repair work may become structurally or visually unstable or incompatible and should be removed and properly rehabilitated.

Replacement of glazed architectural terra-cotta: Replacement of severely spalled, damaged, or missing glazed architectural terra-cotta elements is always difficult. Certainly, in-kind replacement is advisable, but it has a number of drawbacks. Stone, fiberglass, and precast concrete are also viable choices, but like in-kind replacement, also have their inherent problems.

Several notes on replacement: When replacing glazed architectural terra-cotta, all of the original deteriorated material should be completely removed. Half bricks or similar cosmetic replacement techniques are not advised.

—When possible and where applicable, replacement units should be anchored in a manner similar to the original. Both structural and visual compatibility are major considerations when choosing replacement materials.

—Removing and reanchoring damaged glazed architectural terra-cotta is an extremely difficult if not impossible task. The complexity of the interlocking system of masonry units, back-

fill, and metal anchoring system precludes the removal of the glazed architectural terra-cotta unit without destroying it. Reanchoring deteriorated units is likewise impossible. Therefore, if the terra-cotta in question is loose, severely deteriorated, or its structural integrity in serious question, it is best removed and replaced.

In-kind replacement is possible today, but only on a limited basis. Most new glazed architectural terra-cotta is machine made, not hand made as the original. Thus, the porous tile body of the new material tends to be more uniform but less dense and often not as durable. The glaze on the new glazed architectural terra-cotta tends to be thinner than that on the older material and subsequently more brittle. Machine processing has also produced a glaze that is uniform in color as opposed to historic glazes which were slightly mottled and, therefore, richer. Visual compatibility is an important consideration when replacing in-kind.

Only a fairly limited inventory of in-kind pieces is presently available for replacement such as plain ashlar blocks and the simpler details such as cappings and sills. When deterioration severely damages the more ornate pieces (urns, cartouche work, balusters, etc.) either expensive hand casting or alternative materials must be sought. There is a tendency today to replace damaged ornamental work with simpler, cheaper and more readily available units. This decision *cannot*, however, be supported, as the removal of this work inevitably diminishes the character and integrity of the building. Another major consideration in choosing in-kind replacement is the question of delivery time, which is often quite lengthy. If new glazed architectural terra-cotta is chosen as a replacement material, the architect or building owner should plan far in advance.

Stone may be a suitable replacement material for damaged glazed architectural terra-cotta. Its durability makes it highly appropriate, although the increase in weight over the original hollow units may be of some concern. The fact that historic glazed architectural terra-cotta was glazed in imitation of stone, however, may make the choice of stone as a replacement material a fortuitous one. Metal anchoring may be accommodated easily in the carving. Cost, however, is the major drawback in stone replacement, particularly where rich detailing must be carved to match the original.

Fiberglass replacement is a viable alternative, particularly when rich and elaborate ornamentation has to be duplicated. Casting from original intact pieces can produce numerous sharp copies of entablatures, moldings, balusters, voussoirs, etc. Anchoring is easily included in casting.

Significant drawbacks in using fiberglass replacement are color compatibility, fire code violations and poor weathering and aging properties. The appropriate coloring of fiberglass is exceedingly difficult in many instances. Painting is often unsatisfactory, as it discolors at a rate different than that of the historic glazed original. While fiberglass casting is lighter than the original units and, therefore, of great interest in the rehabilitation of buildings in areas of high seismic activity, many fire code requirements cannot be met with the use of this material.

Precast concrete units show great promise in replacing glazed architectural terra-cotta at this writing. Precast concrete units can, like fiberglass, replicate nuances of detail in a modular fashion; they can also be cast hollow, use light-weight aggregate and be made to accommodate metal anchoring when necessary. Concrete can be colored or tinted to match the original material with excellent results. It is cost effective and once production is in process, precast concrete can be produced quickly and easily.

Experience shows that it is advisable to use a clear masonry coating on the weather face of the precast concrete units to guarantee the visual compatibility of the new unit, to prevent

moisture absorption, to obtain the proper reflectivity in imitation of the original glaze and to prevent weathering of the unit itself. Precast concrete replacement units are presently enjoying great use in replicating historic glazed architectural terra-cotta and show promise for future rehabilitation programs.

Once the replacement material is selected (new glazed architectural terra-cotta, stone, precast concrete, or fiberglass), it must be reanchored into the masonry system. Original metal anchoring came in numerous designs, materials and coatings ranging from bituminous-coated iron to bronze. While most of these anchors are no longer available, they may be easily replicated in large quantities either in the original material when appropriate or out of more durable and available metals such as stainless steel.

Since the masonry backfill is already in place in the historic building, the new replacement unit with anchoring may simply be fitted into the existing backfill by boring a hole or slot for anchor and bedding the anchor and the unit itself in mortar. When replacing historic glazed architectural terra-cotta which originally employed metal anchoring, it is important to replace that anchoring when replacing the unit. Serious problems may result if anchoring is omitted in restoration when it was used originally. It is erroneous to assume that mortar alone will be sufficient to hold these replacement pieces in place.

Summary

Today, many of this country's buildings are constructed of glazed architectural terra-cotta. However, many of these are in a state of serious deterioration and decay. Glazed architectural terra-cotta was, in many ways, the "wonder" material of the American building industry in the late 19th century and during the first decades of the 20th century. New technology and methods of rehabilitation now hold promise for the restoration and rehabilitation of these invaluable and significant resources. Restoration/rehabilitation work on glazed architectural terra-cotta is demanding and will not tolerate half-way measures. Today's preservation work should equal the spirit, attention to detail, pride in workmanship and care which characterized the craftsmanship associated with this widely used, historic masonry material.

Suggested Further Readings

- "Recipes for Baked Earth." *Progressive Architecture*, (November, 1977).
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This Preservation Brief was written by de Tiel Patterson Tiller, Architectural Historian, Technical Preservation Services Division. Information for this publication was based in part upon interviews and consultation with Theodore H.M. Prudon, The Ehrenkrantz Group, P.C., New York, New York. Additional comments and information were provided by Si A. Bortz, Illinois Institute of Technology Research Institute, Chicago, Illinois, and Jerry G Stockbridge, Wiss, Janney, Elstner, and Associates, Northbrook, Illinois.

This publication has been prepared pursuant to Executive Order 11593, "Protection and Enhancement of the Cultural Environment," which directs the Secretary of the Interior to "develop and make available to Federal agencies and State and local governments information concerning professional methods and techniques for preserving, improving, restoring and maintaining historic properties." Preservation Briefs: No. 7 has been developed under the technical editorship of Lee H. Nelson, AIA, Technical Preservation Services Division, Heritage Conservation and Recreation Service, U.S. Department of the Interior, Washington, D.C. 20243, June 1979. Comments and suggestions are welcome.