A POST CONSTRUCTION EVALUATION OF AN INTERIOR LANDSCAPE AND RELATED SPACES

BY

GREGORY ALAN WARREN

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Approved by:

Paul Windley

Major Professor

TABLE OF CONTENTS

List of Figures.....iii

List of Tables..... iv

ACKNOWLEDGEMENTS..... v

Chapter I - PREFACE TO POST CONSTRUCTION EVALUATION..... 1

Section A - Problems Confronting Post Construction Evaluation in an Interior Landscape..... 6

Section B - Hypothesis of Solution for Post Construction Evaluation in an Interior Landscape..... 10

Chapter II - HISTORY OF INTERIOR LANDSCAPING..... 13

Chapter III - THE SITE (Crown Center Hotel)..... 29

Chapter IV - THE METHOD OF EVALUATION..... 44

Section A - The Designer's "Focus Assumptions"..... 45

Section B - Preface to Survey Techniques..... 52

Section C - Interviews..... 54

Section D - Information for Interviewers..... 58

Section E - Questionnaire..... 64

Section F - Ethics..... 66

Section G - Behavioral Observations..... 68

Chapter V - DATA POOL..... 84

Section A - Behavioral Maps..... 85

Section B - Interviews..... 91

Chapter VI - ANALYSIS OF DATA.....100

Chapter VII - REVIEW OF TECHNIQUES.....120

Section A - Gathering the Designer's Criteria on "Focus Assumptions".....122

Section B - Interviews with Users.....124

Section C - Behavioral Observations.....126

Section D - Data Analysis.....129

BIBLIOGRAPHY.....131

APPENDIX.....137

LIST OF FIGURES

FIGURE

1. Needs of Users..... 4
2. Linear "Design Process"..... 7
3. Circular "Design Process"..... 7
4. Builder-User-Client Relationship..... 15
5. Builder/User - Client Relationship..... 15
6. Landscape Architect/User - Client Relationship..... 17
7. Landscape Architect/User/Client Relationship..... 17
8. Five Steps in the Design Cycle..... 27
9. Crown Center Development Plan..... 31
10. Street Closure and New Street Plan..... 33
11. Site Plan of Crown Center..... 34
12a. Garden Level..... 36
12b. Top Level..... 37
12c. Prefunction Level..... 38
12d. Mezzanine Level..... 39
12e. Lobby Level..... 40
12f. Section..... 41
12g. Section..... 42
13. Behaviors..... 78
14. Top Level..... 86
15. Garden Level..... 87
16. Prefunction Level..... 88
17. Mezzanine Level..... 89
18. Lobby Level..... 90
19. Number of Objects/Arousal Ratio.....105
20. Proposed Seating Arrangement.....107

LIST OF TABLES

TABLE

1. Summary of Improvements.....32
2. Designer's "Focus Assumptions".....46
3. Questions Administered to Designer.....50
4. Sample Response Scale.....57
5. User Types.....76
6. Random Station Selection Chart.....82
7. Question/Response Analysis (Total Scheme).....92
8. Question/Response Analysis (Top Level).....95
9. Question/Response Analysis (Interior Garden & Waterfall)....96
10. Question/Response Analysis (Prefunction Level).....97
11. Question/Response Analysis (Mezzanine Level).....98
12. Question/Response Analysis (Lobby Level).....99

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CHAPTER I

PREFACE TO POST CONSTRUCTION EVALUATION

SECTION A

PROBLEMS CONFRONTING POST CONSTRUCTION EVALUATION IN AN INTERIOR LANDSCAPE

SECTION B

HYPOTHESIS OF SOLUTION FOR POST CONSTRUCTION EVALUATION IN AN INTERIOR LANDSCAPE

With the base of Landscape Architecture broadening, Landscape Architects are now becoming more involved in the field of interior landscaping. Post Construction Evaluation (P.C.E.) may be an extremely valuable tool in further improving design skills and provide more orientation to the user. Certainly P.C.E. is not utilized by most design firms today. The American Society of Landscape Architects describes this inadequacy in the publication, Post Construction Evaluation in Practice and Education. A segment of this publication confronted a representative sample of design firms and agencies with a questionnaire, to which 45 out of 127 replied. Of these 45 firms, most did not know of anyone actively engaged in Post Construction Evaluation (P.C.E.)[1]

The proposed outcome of this report will allow designers to become: 1) aware of the need for P.C.E. and understand its content in terms of society and the design process, 2) capable of conceptualizing a P.C.E. problem, designing the research, choosing simple methods, analyzing the data, and writing a report (methodological background), and 3) capable of applying their findings to the design process.

The Landscape Architect in the author's case study, Crown Center Hotel in Kansas City, was not involved in the programming of the hotel's interior garden space. The site was already programmed to contain the hillside garden, with a walk and waterfall inside the garden. The landscape architect's (Robert Shaheen) role was simply to develop plans for the steep

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[1]Ervin H. Zube, Post Construction Evaluation in Practice and Education, McLean, Virginia, The American Society of Landscape Architects.

garden within the architect's (Harry Weese and Asaociates) overall master plan. Too often, the landscape architect's role is one of ornamentation, not developing the design concept and therefore his expertise ia not utilized to the fullest extent.

Even when the landacape architect is part of the design team, much of the dialogue that is carried on concerning the design concept is carried out primarily with the client (an individual, corporation or governmental agency) without in depth conaideration or input from the eventual uaers. Decisions are often made superficially with regard to known needs of the users (Fig. 1).

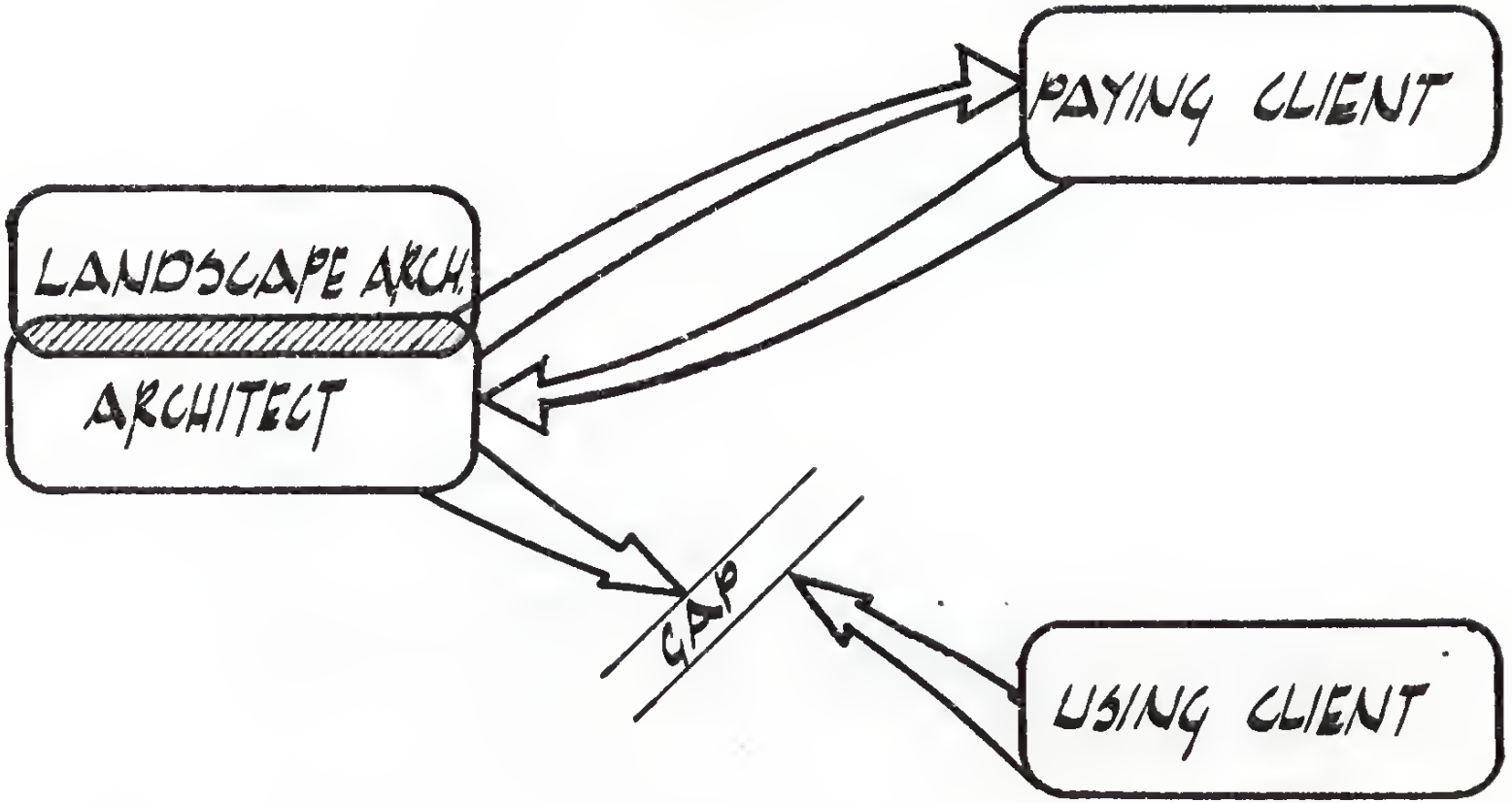
The landscape architect or designer of interior landacapes is often an intervenionist between the designed environment and the user, in which he is increasingly confronted with questions concerning what people want, how they will react and what they expect. From physical design, the designer controls the spacial arrangement of the setting which subsequently contributes to the shaping of individual styles of life. The designer's intervention may be of major or minor input, however, it can and most probably does, effect the lives of people and makea the role of the designer of these environments extremely important.

To make our environments functional for the uaer, there must be a common commitment on the part of designers to maximize freedom of user interaction with the environment, to look for underlying meaning in the social behavior of particular user groups, and to respect those needs by designing environments which accommodate needs rather than conflict with them.

Although environmental designers are becoming increasingly aware

FIGURE 1

NEEDS OF USERS



of the need to incorporate user based evaluations in the design process, most still choose not to apply P.C.E. in actual practice.

PROBLEMS CONFRONTING POST CONSTRUCTION EVALUATION IN AN INTERIOR LANDSCAPE

In the majority of the professional firms at present, the design process is usually terminated at the completion date of the project. The primary reason professional firms do not utilize P.C.E. is because of the additional cost post construction evaluation presents. Consequently, the practice of learning from past successes and failures in a systematic wsy has not materialized. The few post construction evaluative studies that have been undertsken tend to produce data that are non-cumulative, non-comparable and non-supportive of the feedback loop in the design process (Fig. 2).

Essentially, there are four main factors contributing to the lack of construction evaluation (P.C.E.).

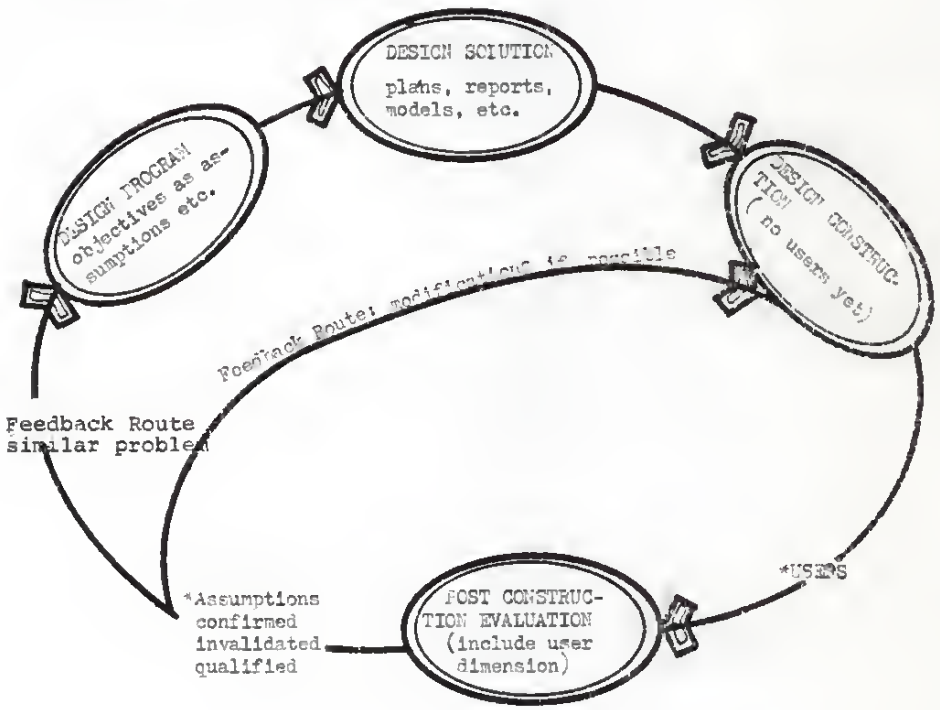
1. Additional costs.
2. A feeling on the part of the landscape architect that he is not competent to undertake an evaluatory study such as P.C.E.. However, the social scientist conducting an evaluation of a physical environment often may be apathetic to physical environments.
3. Many landscape architects perceive P.C.E. as possibly being a threat to their livelihood because it quantitatively evaluates design decisions (some of which are poorly evolved) in published form.
4. A minimal demand on the part of the public or design

FIGURE 2

LINEAR "DESIGN PROCESS"-The Familiar Model

FIGURE 3

CIRCULAR "DESIGN PROCESS" - The Alternative



professions for P.C.E.[2]

Presently, a majority of environmental design activities are subject to direct or implied supervision by related public policies and programs, be they local building codes, zoning ordinances, federal guidelines, etc. These public projects effect the lives of thousands of people, and involve millions of tax dollars. Yet, there are few, if any, design firms and public agencies that even attempt to assess the effectiveness of public policies and programs in terms of improving the quality of the designed environment.

In the early sixties, came the rebirth of the "green revolution" resulting in the conception of many interior landscapes. At present, a majority of these landscapes, as well as their surrounding areas, are judged purely on aesthetic features with a minimum of forethought being given to how physical design effects human behavior.

Too often, invalid value judgements with regard to user reaction to a preconceived space are imposed by the landscape architect. A landscape architect may hypothesize different functions for specific elements within the design concept; for instance, a bench may be assigned a particular location in the design. The designer has thus placed a preconceived value judgement into the design concept and assumed it will be used for sitting and hopefully for conversation or viewing (Focus Assumptions). P.C.E. may prove the assumption to be valid--or perhaps invalid.

At present, P.C.E. is in its infant stages. Only a minimal amount

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[2]Zube, op. cit.

of user based evaluations have been performed due to the efforts of a few behavioral scientists and an even smaller number of design professionals. The methods and procedures used by both the behavioral scientists and designers are still primitive, possessing neither the resources or knowledge necessary to perform accurate evaluations. Although in time, with increased demand for better user environments and the valuable feedback a designer receives from P.C.E., evaluation methodology will evolve.

In conclusion, the user dimension must be taken into account in every post construction evaluation to insure the proposed environment will not only be aesthetically pleasing, but also functional for the participant.

HYPOTHESIS OF SOLUTION FOR POST CONSTRUCTION EVALUATION IN AN INTERIOR LANDSCAPE

If P.C.E. is to become a useful tool in the design process, its value must be proven. Following are several recommendations which might assist in the case for P.C.E.:

1. The results of P.C.E. should be more broadly communicated in the professional literature and through the publication of exemplary case studies.
2. Professional organizations such as the A.S.L.A. and A.I.A. should work aggressively for the inclusion of P.C.E. as an integral part of the design process in publicly funded design contracts.
3. Universities should assume the responsibility to research P.C.E. methodology and serve as regional centers for collection and dissemination of P.C.E. data as a service to professionals within their respective regions.
4. Short courses should be developed by the university community on both "quick and simple" and "more sophisticated" approaches to P.C.E. so as to provide design professionals with the skills and techniques that are both reasonable in terms of time and money useful in terms of application.
5. Design oriented curriculums should incorporate P.C.E. into their studies relating the strong tie between the design process, the resultant environment and the

user thereof.[3]

This study will research and evaluate an actual interior landscape at the Crown Center Hotel, hopefully demonstrating how one may further enhance the present situation and similar interior landscapes by quantitatively evaluating the validity of assumptions encompassed within the initial design concept of interior spaces and facilities. Hopefully, as more user based evaluations of the interior environment are undertaken, landscape architects will become more aware of their effectiveness and sensitive to user needs in the design process.

The methodology herein will provide a rationale behind why each evaluative tool was chosen and why others were deemed not suitable for the P.C.E. of the subject case study. Hopefully, the included rationale will aid the designer or researcher in the selection of appropriate evaluative tools to implement future P.C.E.'s. As the landscape architect gains a familiarity with this methodology, hopefully, he will also envision P.C.E. not as a threat to his livelihood, but as an asset to the design process.

If the P.C.E. process can be proven beneficial, the process will be utilized to a much greater extent in the future, allowing design professionals to gain a sensitivity to the individual needs of the users actually participating in the environment. This awareness of the user's needs, on the part of the designers, will enable the designer to not only build aesthetically pleasing environments, but also designs that are more

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[3]Zube, op. cit.

compatible with the user.

The acceptance of P.C.E. will allow the continuing feedback of user response to be considered in the design process and even though the unpredictable will always be present, hopefully decrease to some extent anyway the unknown element in the design process.

CHAPTER II

HISTORY OF INTERIOR LANDSCAPING

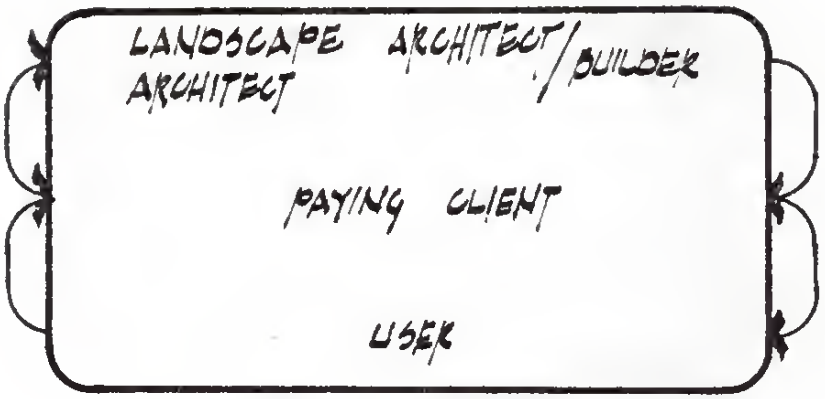
At present, professional designers, including landscape architects, are not aware of the needs of the people for whom they design spaces. The means employed for determining participant needs within a space are nominal based on personal preference or intuitive assumptions. A brief historical summary regarding the development and use of plan material with interior spaces follows.

Historically, interior gardens were designed and built by the owner himself, relying on the family or close social contacts to advise him. Thus, there were no communication problems (Fig. 4). Later, as trades began to specialize, the local builder built interior gardens for his neighbors, yet his design still refelcted the user's needs because he was in close contact during the design and construction process, being well aware of living habits and social requirements. Besides the form, design and relationship to surrounding interior landscapes, the garden designs were often dictated by traditional and religious values (Fig. 5).

As time evolved, the design and construction activities became separate activities, and with the rise of the design professionals, specialized designers were employed to design garden environments for individuals they initially did not personally know. Even with construction-design activity separated, the designer still dealt with one client who paid for, criticized, and became the prime user of the space. The designer dealt principally with the client/user. The designer determined needs and desires of the user/client, interpreted and analyzed the information in relation to past experience in similar situations; discussed

FIGURE 4

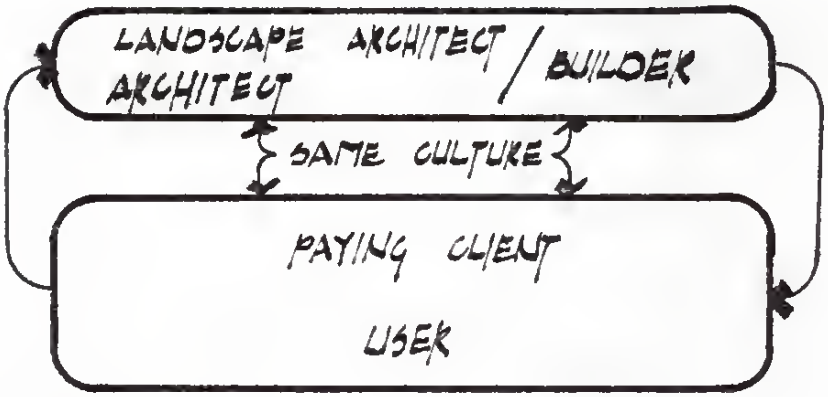
BUILDER-USER-CLIENT RELATIONSHIP



The same individual built, used and paid for the interior landscape.

FIGURE 5

BUILDER/USER - CLIENT RELATIONSHIP



A functional interior landscape was built by the landscape architect for the paying client as well as the user, because the landscape architect could relate to the paying client/user.

objectives and means with his client, and finally reached agreements on the design concept. Since the designer generally came from the same stratum of society as his clients, they could usually carry on dialogue based on common experience and shared assumptions. Once again, there were few communicational problems (Fig. 6).

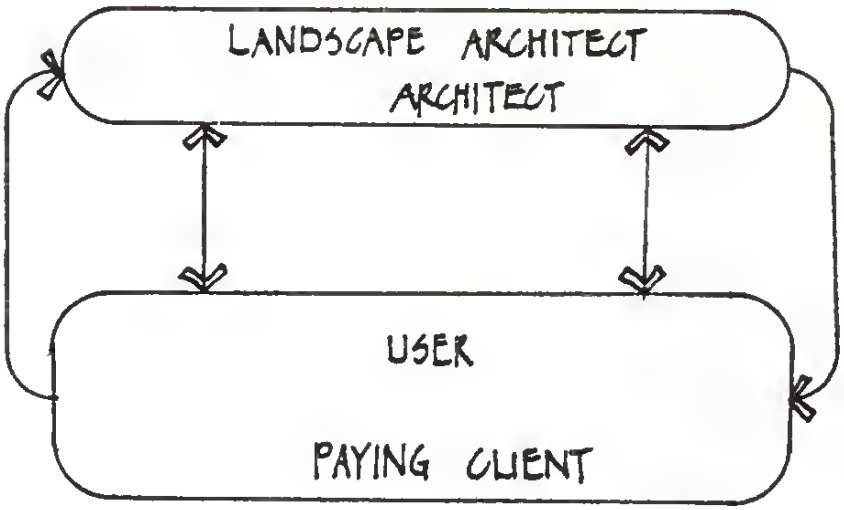
Since the beginning of the nineteenth century, more interior spaces have been constructed for the masses. The designer was beginning to lose the personal contact with the individuals using the designed spaces. In reality, the designer was subject to two (2) clients--the client who commissions and to a large part, controls the project design, and the client who uses the built space (Fig. 7).

Often todays designer either comes from or has been educated in a social or cultural setting quite different from that of the user for whom he designs, consequently, making it difficult to interpret the user's needs. Historically, he has been taught to carry on a dialogue with the commissioning client be he individual, corporation, governmental agency. Through formal schooling, the landscape architect is led to assume that the commissioning client should know the needs of eventual users. In fact, he seldom does. The main factors contributed by the client are constraints of budget and schedule rather than on the known needs of the users.

The proposed intent is to trace the evolution of interior landscapes, and particularly public and semi-public interior spaces with regard to actual use patterns and activities compared to original intentions.

FIGURE 6

LANDSCAPE ARCHITECT/USER - CLIENT RELATIONSHIP

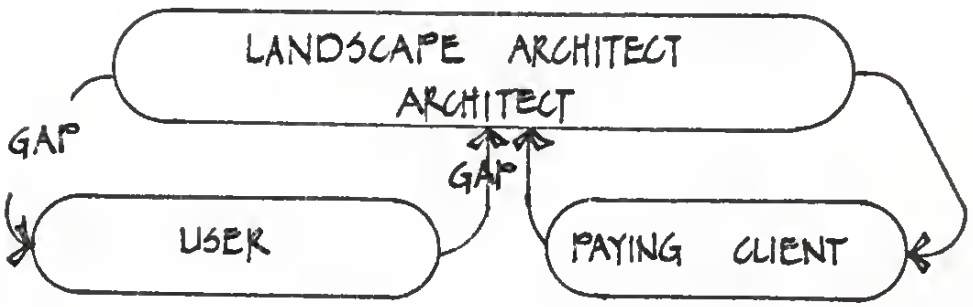


Although the landscape architect did not know the paying client/user, he kept close contact with these individuals, so there were usually no inadequacies involved within the interior landscape.

FIGURE 7

LANDSCAPE ARCHITECT/USER/CLIENT RELATIONSHIP

Three individuals involved--too often the user's forethought is disregarded.



Plants being introduced into artificial climates could have easily been adapted to the environments of the Greeks in the fifth century B.C.[4]

During Medieval period of ancient Rome (476 A.D.), the Romans used hot water and flue systems in their houses which could have been easily modified for the forcing of vegetables. [5]

Although the origin of interior plants dates back to fifth century B.C., it was not until the birth of the Renaissance in 1540 that man adopted a methodical approach to the study of nature and in particular, the growth of plants. The sixteenth century brought about the first botanical garden in Pisa in 1543. This botanical garden set a precedent and by the end of the decade, botanical gardens existed in Padua and Florence, with Balogna and Leyden gardens of Holland in progress by the end of the century. With the advent of these botanical gardens, came the evolution of the witidarium or greenhouse. The first greenhouse to be established was in Padua and the primary use was a wintering shed for the more delicate species of plants.

The dissemination of knowledge about plant environments in England in the sixteenth century, as in Holland, was closely associated with commercial exploration and international trade. The Eastern trade through Venice and Genoa brought many new plants into the gardens of the North Italian merchants as well as into the new university botanic gardens.

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[4]John Hix, The Glass House, (London: Phaidon Press, 1974), p. 9.

[5]Hix, Ibid., p. 9.

From these locations, botanic expertise as well as the plants spread through Northern Europe.

The seventeenth century was characterized by authors such as Sir Hugh Platt, who published practical advice and general reflections on forcing and greenhouse gardening under the title of "The Garden of Eden" oriented to primarily the aristocracy.[6] During this period, the rich competed with each other to have the best gardens and to employ the most well-known gardeners. The main emphasis of their endeavors was with citrus fruits for the table and for decorative qualities. By the end of the seventeenth century, the search for plants was increasing with great intensity. Expeditions for plant and seed collections were financed around the world by wealthy private collectors and institutions like the Oxford Botanical Garden. The "Apothecarie" Gardens at Chelsea was perhaps the most prestigious of all the botanical gardens because of the number of curious exotics it contained. The high number of exotics was mainly attributed to the Company of Apothecaries. The Company of Apothecaries donated fifty new plants per year for fifty years. Other botanic gardens around the world were not as fortunate in acquiring their collections, depending on professors of Botany to build up collections through expeditions or exchange with other botanical gardens of the timme. It was said that a merchantman never left the ports of Northern Europe without the captain being asked to procure seeds and plants from exotic foreign shores.[7]

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[6]Hix, op. cit., p. 9.

[7]Hix, op. cit., p. 10.

By the beginning of the eighteenth century, the Dutch were building greenhouses that were engineered to control the environment utilizing sloped glaas roofs allowing maximum penetration of the sun's rays.[8] Noting the importance of light to plant development, glass roofs were first installed in 1717 and experiments in their pitch and design were carried out in the middle and end of the eighteenth century by Philip Miller.[9] Miller described his reason for this change to pitched glass roofs:

> "The most tender exotic plants ought to have their glasses so situated as to receive the sun's rays in direct lines as great a part of the year aa possible. For which reason the stoves which have upright glass in front and sloping glasses over them, are justly preferred to any at present contrived."[10]

The dawn of the nineteenth century in Britain saw a culture heavily oriented to the use of plants in interior spaces. In 1810, Walter Nichol wrote "a garden is now not reckoned complete without a greenhouse, or conaervatory with flued walls and with frames and lights".

The Victorians had developed a mania for glaas as a building material. In provincial food markets, railway stations and Decumus edifice at Kew, glass structures were beginning to predominate. This upsurge may be attributed to the mass of exotic plants that were pouring into the country from the Orient and the tropics near the end of the eighteenth century. The need to develop micro climates for their survival certainly caused an increase in glass houae construction; and since the glass houses

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[8] Hix., op. cit., p. 12.

[9] H. F. Clark, "A History of Interior Plants," Architectural Review, Vol. III, (May, 1952), p. 286.

[10] Hix, Ibid. p. 16.

and plants were complimenting each other and becoming increasingly more sophisticated, both multiplied at a fantastic rate.[11]

Exotic plants need expert guidance in their care and subsequently, many horticultural publications were printed from the last quarter of the eighteenth century and onwards. Several books, A Gardeners Pocket Dictionary, 1786, written by John Abercrombie and Remarks on Hothouses, 1817, written by John C. Loudon, exemplified the new era of horticultural interest invading London's societies. Loudon developed the first semi-dome forcing house, allowing for maximum efficiency of the sun's rays. Loudon was also an avid proponent of iron construction while others still used wood. In 1816, Loudon developed the first sash bar molded to a desired curvature thus opening a new era in curvilinear glass construction.[12]

In 1808, Humphry Repton conceived the designs for the Pavillions at Brighton in which he presented a new idea in garden architecture, the conservatory. This new style not only attempted to accomodate plants with seasonal change from around the world, but more significantly, attempted to integrate the greenhouse with the residence. This was a significantly differing approach contrasted to past endeavors, for man was attempting to live harmoniously with nature rather than dominate it. In addition to the greenhouse, these conservatories often contained a hothouse, aviaries, pheasanties and orangeries. Reptan advocated connecting the house to the conservatory to alleviate the parlour's formal gloom. He published

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[11]Clark, op. cit., p. 287.

[12]Ibid., p. 289.

Fragments on the Theory and Practice of Landscape Gardening, 1816, which illustrated "before" and "after" drawings of the positive aspects of integration of house and conservatory.[13]

The attached conservatory brought about a revolution in London society suggesting even the ordinary citizen to have such a structure. Usually adjacent to the drawing room, the conservatory was first considered mainly for feminine use. In 1864, Robert Kerr published the English Gentlemen's House, which takes for granted the necessity of a conservatory integrated with the house. The public was beginning to perceive the conservatory no longer as a simple extension of the house, but as an integral part of the way of life. Centered on the conservatory, Victorian house plans read more like recreation centers than our drab houses of today.

Between 1850 to 1880, the Natural or Picturesque Style reigned dominant, diaregarding Victorian geometry and individual specimen planting.[14] Every effort was made to camouflage the iron structure and enclosing glass roof and walls in order to recreate the natural exotic habitat of tropical Brazil, Africa and India.

William Cobett, a nineteenth century writer concerned with industrialization, began to notice the significance the conservatories were contributing to the social structure. He describes an excellent example of this in the English Gardener, 1829:

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[13] Hix, op. cit., p. 82.

[14] Ibid., p. 92.

> "It is the moral effects naturally attending a greenhouse that I set most value upon. There must be amusement in every family. Children observe and follow their parents in almost everything. How much better during the long and dreary winter for daughters and even sons, to assist their mother in a greenhouse than to be seated with her at cards or in the bluberings over a stupid novel or at any other amusement than can be possibly conceived!"[15]

The popularity of the conservatory continued to grow as did the demand for greater environmental control and size, which only intensified the debate between gardener and architect. The gardeners complaint was simple: too much effort was put on the architectures to the detriment of a proper environment for the plsnts.[16]

During the 1900's, the conservatory faded to the countryside and the estate homes of the wealthy; however, in congested urban aress association with plants was still considered important thus the evolvement of the roof garden. As land is scarce and expensive in urban areas, the roof was an obvious location for garden activities. W. Bridges Adams could foresee the potential of the roof-top gardens in the nineteenth century. He proposed stripping off the existing roofs of London terraces and replacing them with roof gardens. The reasoning behind Adams' idea is best explained by a quote of his:

> "Gardens of this kind would be as in the East, the resort of the family in fine weather and in bad weather, a warm greenhouse on the roof would be a more pleasant thing than a dark parlour. Scarcely anything could be conceived more beautiful than the enormous expanse of London roofs covered with shrubs and flowers. It would be a perfectly practicable thing to construct the greenhouse that they might be open or closed at pleasure."

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[15]Robert Herrick Carter, "The Garden Scene, Bringing the Outdoors Inside", Interiors, Vol. 46, (Feb. 1975), p. 124.

[16]Hix, op. cit., p. 89.

The evolution of the grand conservatory and its aaaociated glass houses could only have come about with the great affluence of a few in the nineteenth century. Each conservatory required an extensive amount of labor and this dependence on manpower for continusnce was a contributing factor in its' downfsll. Industry lured gardeners with higher wages, and fuel rstioning in the First World War killed many of England's vast botanic collections.[17] The twentieth century brought with it new forms of entertainment and transportation with orientation away from the permanent dwelling. The conservatory seemed dull compared to new attractions such as the cinema, the automobile, and even the airplane leading to further declining emphasis on the conservatory.

No significant achievements concerning the interior use of plants are noted between World War I and 1946, until Clive Entwistle and Cue Arups entered a huge glass-covered pyramid in the Crystal Palace Competition. This entry reawakened the tradition of glass enclosed recrestion buildings which began in England some two hundred year prior.[18]

In 1950, Buckminister Fuller mirrored J. C. Loudon's hypothesis of enclosing vast tracts of land and creating an artificial climate via two-mile diameter geodesic dome over Manhattan.[19]

Although it was never implemented, the engineers have the necessary expertise to develop the environmental equipment necessary to climatize such large man-made spaces.

In the past decade, interior space design has undergone a green

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[17] Hix, op. cit., p. 94.

[18] Ibid, op. cit., p.184.

[19] Ibid, op. cit., p. 185.

revolution. Plants may be seen almost anywhere--covered shopping malls, offices, even parking garages. But the popularity of plants indoors is not merely because it increases the aesthetics of interior space but is also functional and has economic overtones. Besides reducing interior design costs, it provides greater flexibility of design, increases retail sales, boosts the value of rental space and humanizes the interior architecture. It is not uncommon today, in fact, to observe the architect and interior landscape architect working congruently on evolving an interior space in contrast to considering interior plantings as an afterthought.[20]

When German designers in the early 1960's introduced open office landscaping, a corresponding decrease in floor to ceiling partition and glass and steel cubicals was noted. In their place were movable room dividers and a vast garden of plants.[21] But plants did not merely appear in office layouts; plants began to enhance interior spaces of all kinds. The interiors of retail shops, banks, motels, private dwellings, etc., were enhanced by the unique qualities of plant materials. Covered malls became more attractive and healthful when trees and plants adorn their niches. All other things equal, a recognition that an employer can attract the best workers, a landlord the best tenants, and a merchant the most customers because people are more content working or living in interior landscaped spaces contrasted to conventional ones.[22]

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[20] Carter, op. cit., p. 125.

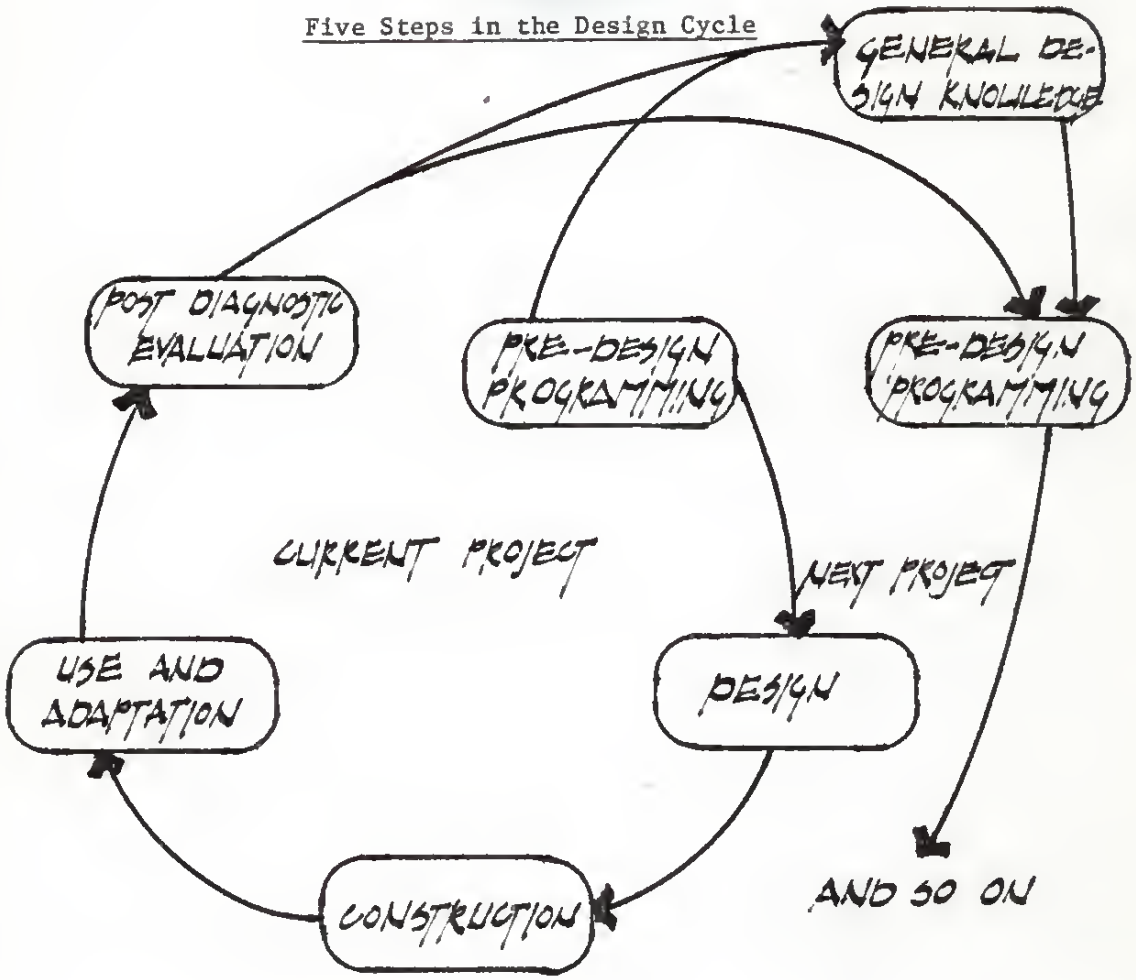
[21] Ibid., p. 126.

[22] Ibid., p. 127.

Too often, value judgements are imposed by the designer or his client on the individual spaces. A designer may hypothesize different functions within a particular space; however, because these decisions are merely value judgements on the part of the designer, their appropriateness should be challenged. Post construction evaluation is a relatively new methodology which measures user response to a particular space compared to the design intent and shall become the basis around which this study shall evolve. Excluding the last 15 years, designers have not had that much need to incorporate social research in their design cycle because it was done unknowingly. However, for the physical designer of spaces who wants to understand the complex needs of users for whom the space is intended, social research is bound to become an indispensible tool. With time, however, the research efforts are useless unless those effects can relate to the basic design decisions to be employed in developing the next space design. The design process begins with "programming". Programming means analyzing the proposed design intent to determine feasibility, perimeters and constraints before actual design begins. Based on the program, the designer develops a "design concept" and then refines the design concept thru three formal phases; "schematic design," "design development," and "construction documents". During this process, ideas are generated: plans drawn, alternatives discussed, preliminaries discarded and redrawn; all involving interaction between the client and the designer. When designer and client reach agreement, the designer prepares construction documents- a set of highly technical "working drawings" and material specifications which detail precisely what is to be built (Fig. 8).

FIGURE 8

Five Steps in the Design Cycle



1.	Programming	(Analysis)	Identifying design objectives, constraints and criteria.
2.	Design	(Synthesis)	Making design decisions which satisfy criteria.
3.	Construction	(Realization)	Building the project and modifying plans under changing constraints.
4.	Use	(Reality Testing)	Moving in and adapting the environment.
5.	Diagnostic Evaluation	(Review)	Monitoring the final product in terms of objectives and use--ideally to be translated into future design criteria.

After construction, the designer should be concerned with use and adaption by participants in the built space. There is growing interest in visiting and evsluating projects after they are occupied. Sometimes, this observstion and review is done by journalists (Berkeley, 1973; Kurtz, 1971; Stephens, 1973); sometimes by architects slone (Karpen and Marshall, 1973); sometimes by social scientists (Bechtel, 1971); snd sometimes by architects and social scientists working together (Cooper, 1970; Rhoadside, 1970; Zeisel snd Griffin, 1974). The primary concern of post construction evaluation is how the user sctually adopts and uses the space compared to the designers original intent--and of course, how other designers might be able to learn from this post analysis. The result of these evaluation studies should be maintained in information banks available to designers who might be involved in conceiving similar spsces or projects.

Until recently, designers relied mainly on their values snd, consequently, many positive use patterns were overlooked, while negative use patterns or should we say supposed use patterns were perpetusted out of ignorance. With Post Contruction Evsluation, (P.C.E.) which provides a systematic, comprehensive spproach and compliments the design process, there may be new input to improve the quality of the future designed environment.

C H A P T E R I I I

THE SITE (CROWN CENTER HOTEL)

The interior garden and related spaces selected by the author for the Post Construction Evaluation (P.C.E.) are located in the Crown Center Hotel. This hotel is just one part of an urban redevelopment program which eventually will cover 100 acres of Kansas City, Missouri's once blighted core area. The 25 square block project area is generally bounded on the south by Union Cemetery, on the north by the terminal railroad tracks, on the east by Gillham Road, and on the west by Main Street (Fig. 9).

Crown Center will be constructed in four phases which are scheduled for completion by May 1, 1981 encompassing fifty buildings providing living, working and shopping accommodations for 50,000 persons, including 8,000 permanent residents. The project will contain 2,113,801 total square feet of office space, 1,901 apartment units, a 90 unit motor inn, in addition to the 750 room hotel, cultural and entertainment facilities, two retailing areas and garaging for more than 8,000 cars (Table 1). Even with the expansive amount of garaging that accompanies such an enterprise, Crown Center was designed primarily for pedestrian movement (Fig. 10).

One of the more extraordinary facts concerning Crown Center is that the owner of the Crown Center Redevelopment Corporation is a wholly owned subsidiary of Hallmark Cards, Inc., therefore making it a private development. Hallmark belongs to the Hall family with a moderate number of shares available to the employees. Since Hallmark is not publicly held, the Halls' are not responsible to outside stockholders, thus allowing Joyce C. Hall (founder) and his son, Donald J. Hall (Hallmark President and Chief Executive Officer), their friends, consultants and

FIGURE 9

CROWN CENTER DEVELOPMENT PLAN

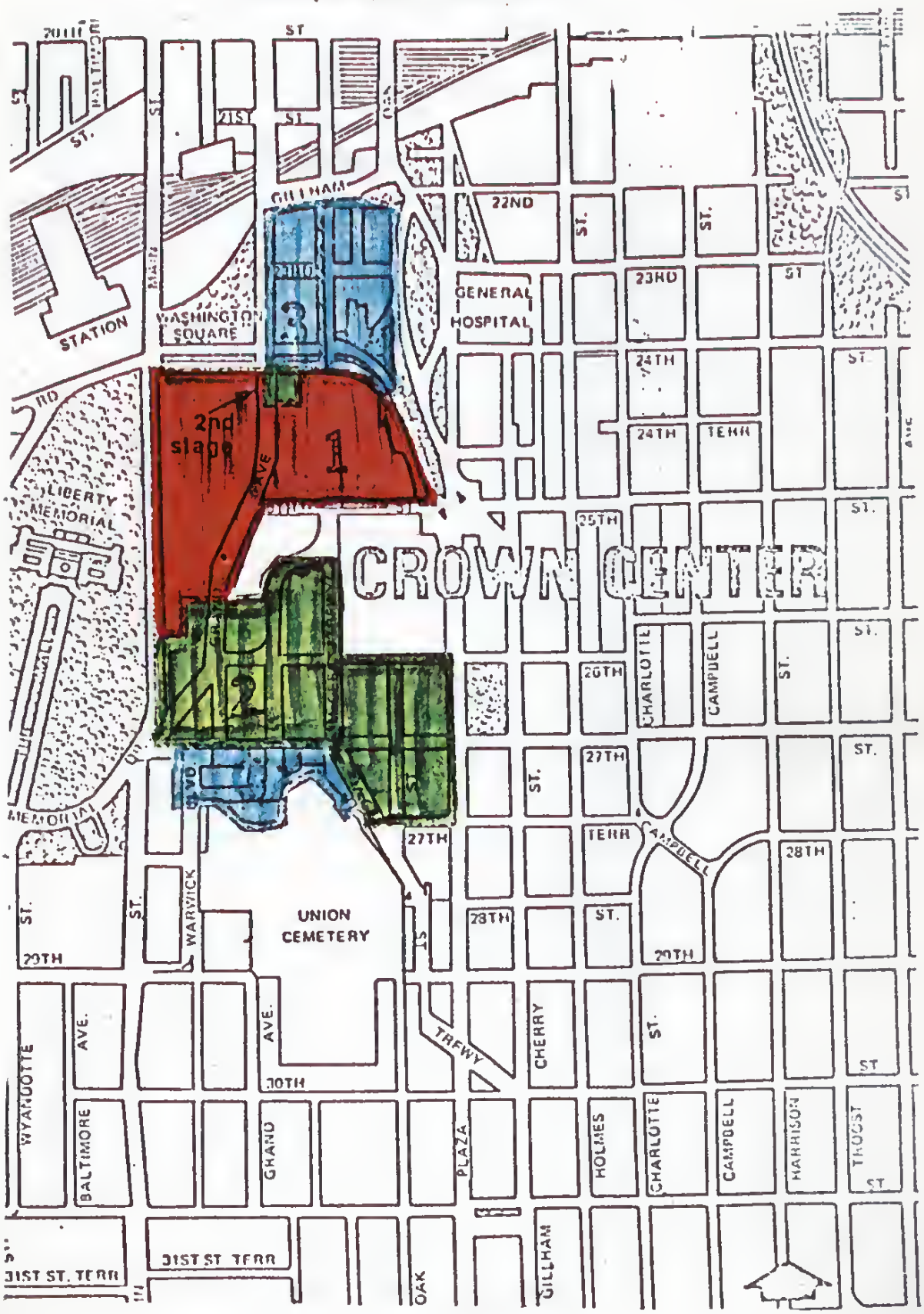


TABLE 1

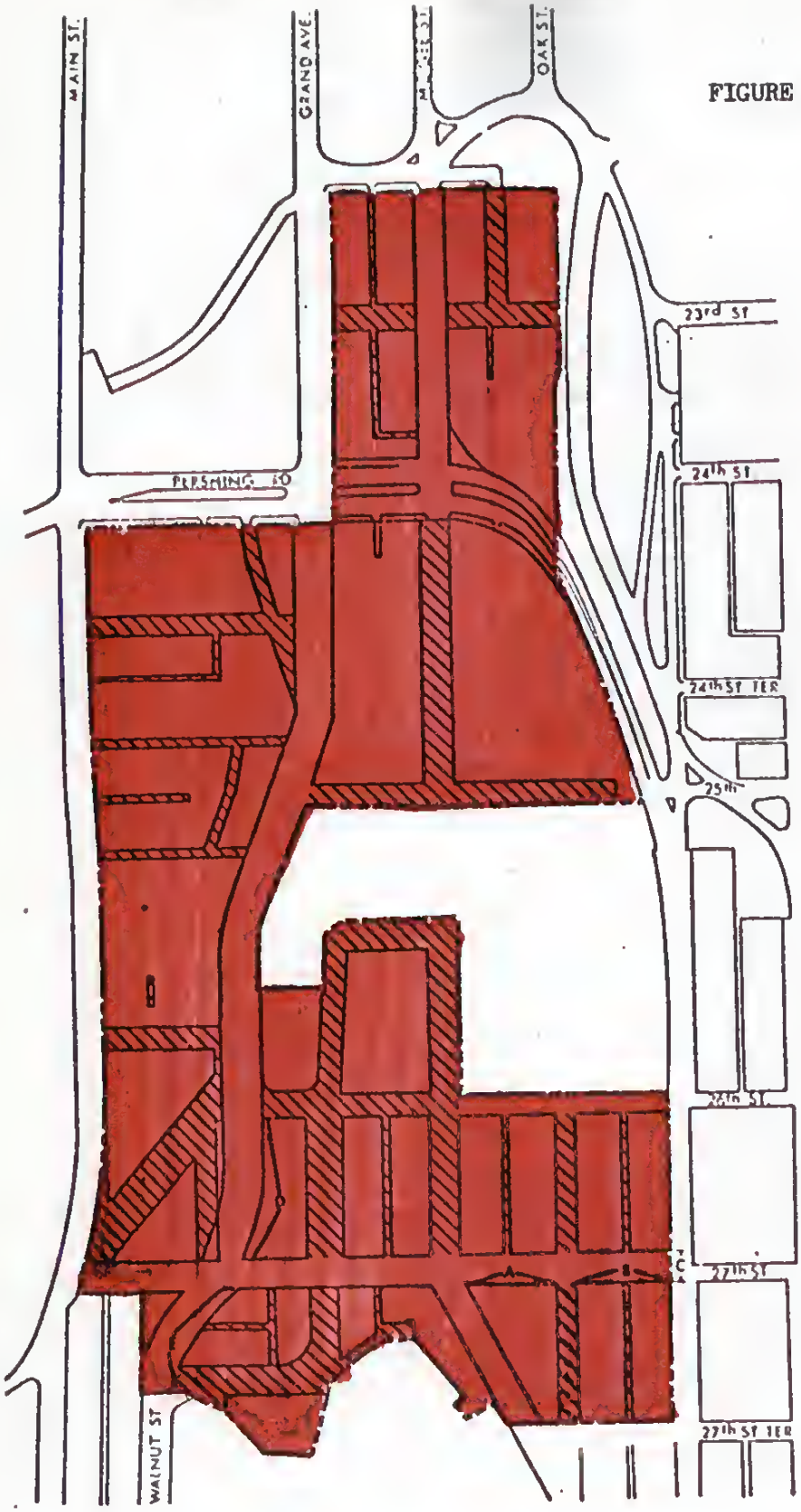
SUMMARY OF IMPROVEMENTS

	Apartment Units	Hotel-Motor Hotel Rooms	Office Sq. Ft.	Commercial Sq. Ft.	Parking Spaces
First Stage	376	750	693,801	356,000	3,972
Second Stage	410	-0-	320,000	89,000	2,181
Third Stage	899	---	1,100,000	8,000	1,990
Fourth Stage	216	90	-0-	-0-	285
TOTALS	1,901	840	2,113,801	453,000	8,428

PROJECT TIME SCHEDULE

	Commence Demolition	Complete Demolition	Commence Construction	Complete Construction	Final Cut-Off Date
First Stage	7-1-62	12-31-69	1-1-70	12-31-72	1-1-77
Second Stage	5-1-74	12-31-74	7-1-74	12-31-77	1-1-82
Third Stage	5-1-78	12-31-78	7-1-78	12-31-80	1-1-86
Fourth Stage	5-1-81	12-31-81	7-1-81	12-31-83	1-1-90

FIGURE 10



STREET CLOSURE & NEW STREET PLAN

public right of way to be abandoned

proposed circulation system

project boundary

A EXISTING GRADES 13.3%

B EXISTING GRADES 8.2%

A/B PROPOSED GRADES 9.7%

C WIDENING OF 27TH ST. TO AN 80' R.O.W. MAY TAKE PLACE ANYWHERE WITHIN 100' DIMENSION

D/E EXISTING GRADES 6-8% PROPOSED GRADES 7%

CROWN CENTER REDEVELOPMENT PROJECT

kansas city, missouri

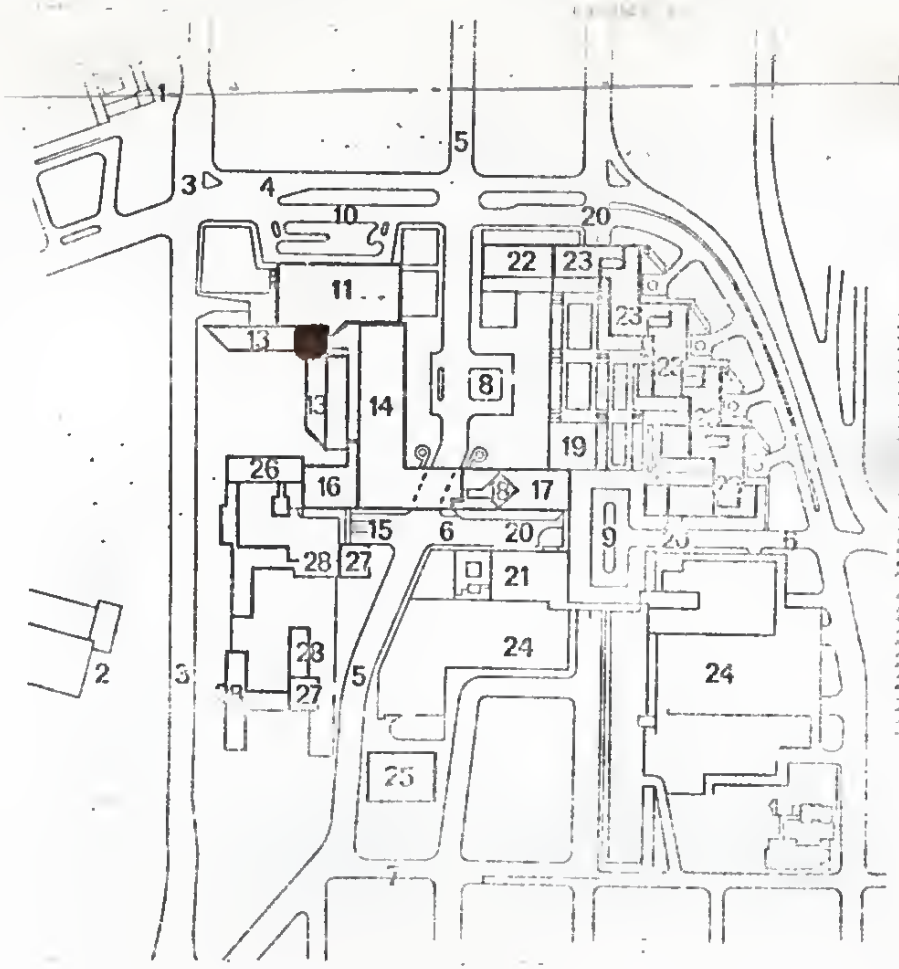

1 Union Station
2 Liberty Memorial
3 Main Street
4 Pershing Road
5 Grand Avenue
6 25th Street
7 26th Street
8 Crown Center Square
9 Hallmark Square
10 Crown Center Hotel
11 Crown Center Hotel
12 Top of the Crown
13 Hotel guest wing
14 Crown Center Shop
15 to retail parking
16 Multimedia Forum
17 Hall's Crown Center
18 American Restaurant
19 Ice rink
20 to parking garage
21 Cable Piano
22 bank
23 office building
24 Hallmark
25 rental apartment
26 condominiums
27 apartment tower
28 low-rise apartments

FIGURE 11

advisors imprint their personal stamp to the project environment.

The opening of the hotel occurred on May 8, 1973, but the thirty million dollar Crown Center Hotel was not the first structure in Crown Center's 200 million dollar urban redevelopment program. Earlier in development were five seven-story office buildings, commonly joined, enframing the multi-fountained, ten-acre pedestrian Crown Center square, under which exists an underground garage for 2,300 cars, the central power plant and a bank. Also preceding the hotel was the Crown Center shops retail complex, and an audiovisual communications center named the Multimedia Forum.

The hotel (Fig. 11) can be described as part of a multi-purpose megastructure, embracing a natural hillside transformed into a garden area. The various parts of this magastructure, including the hotel, the gardens, the retail complex, convention center, entertainment centers, etc., are interlocked by means of an indoor-outdoor multi-level pedestrian circulation system. Interior passageways from the hotel to retail complex and a pedestrian bridge over Grand Avenue's traffic embraces the hotel's public spaces.

The two major components of the hotel are:

1. A five level function block butted into the face of a limestone and shale bluff refitted to an extensive garden space (Fig. 12 a,b,c,d,e,f,& g), about which the majority of this study will revolve.

FIGURE 12a

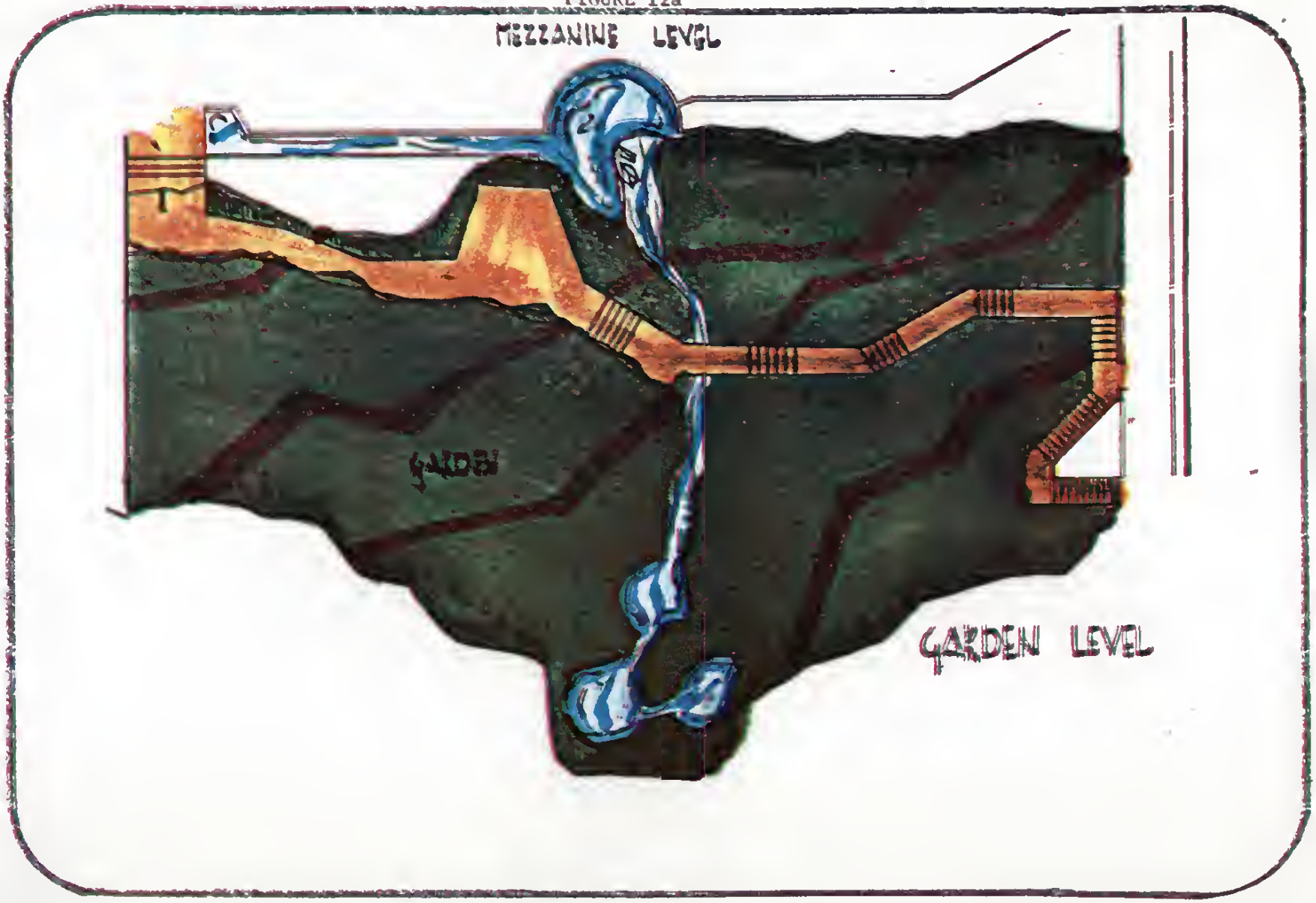


FIGURE 12b

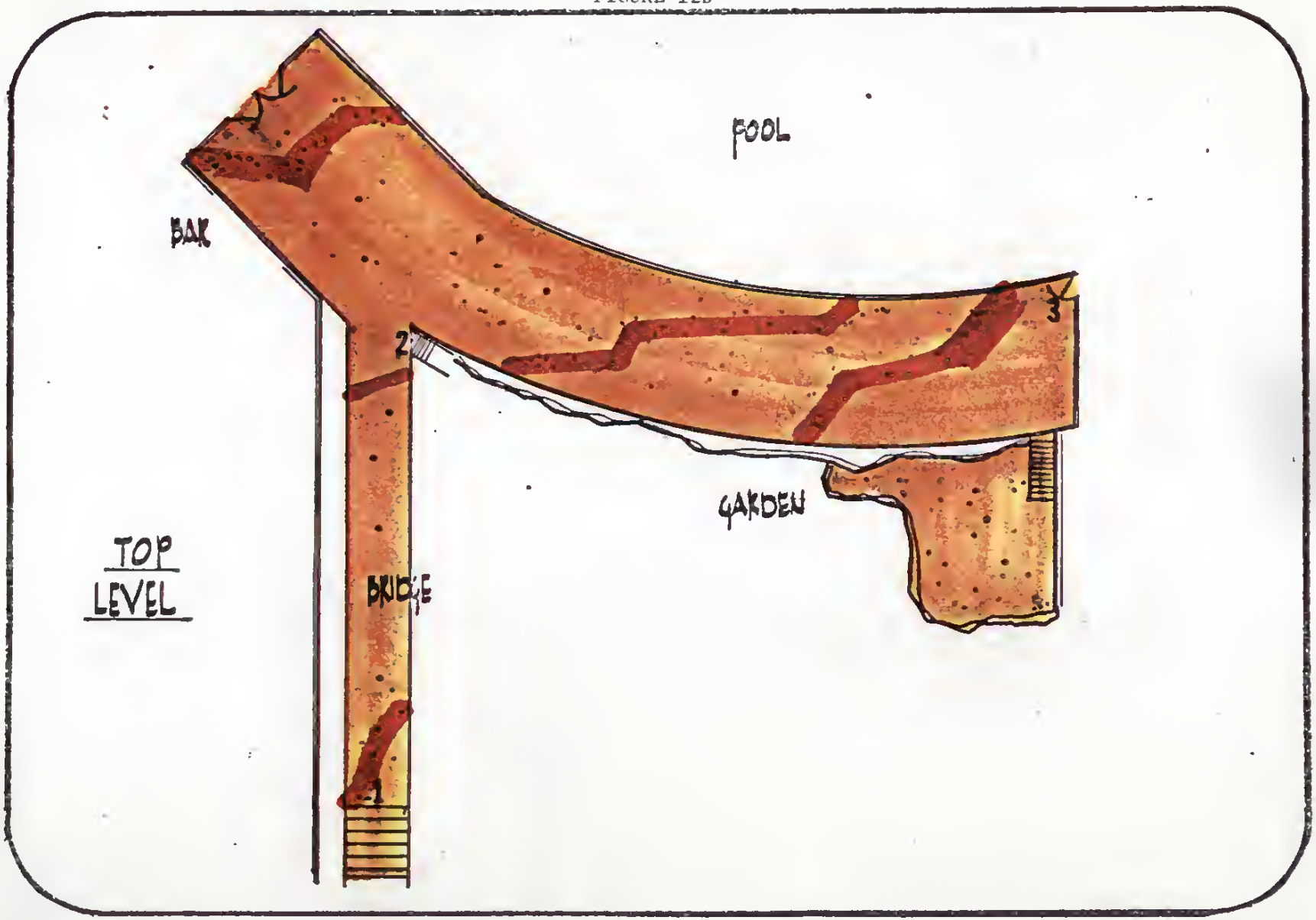


FIGURE 12c

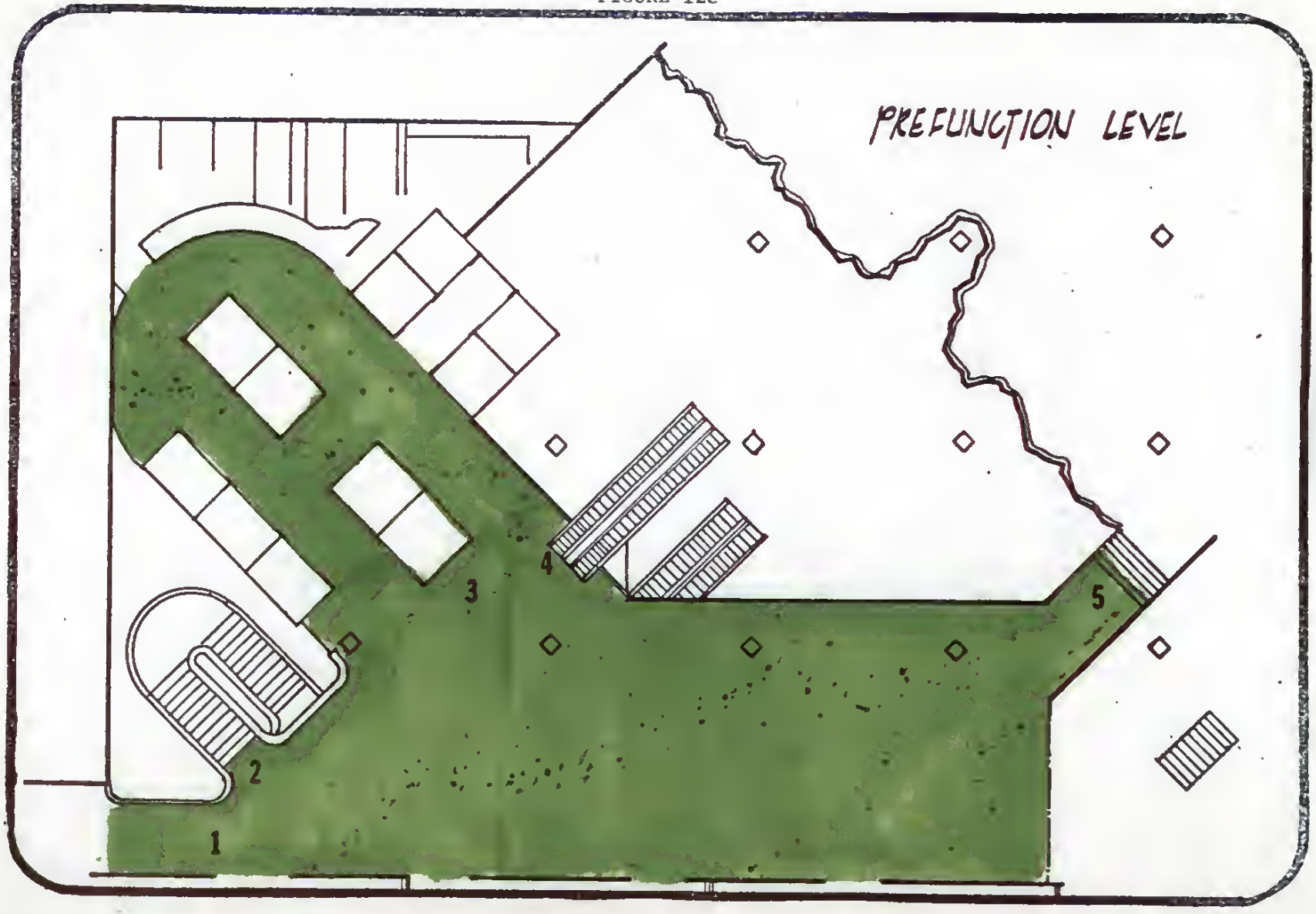


FIGURE 12d

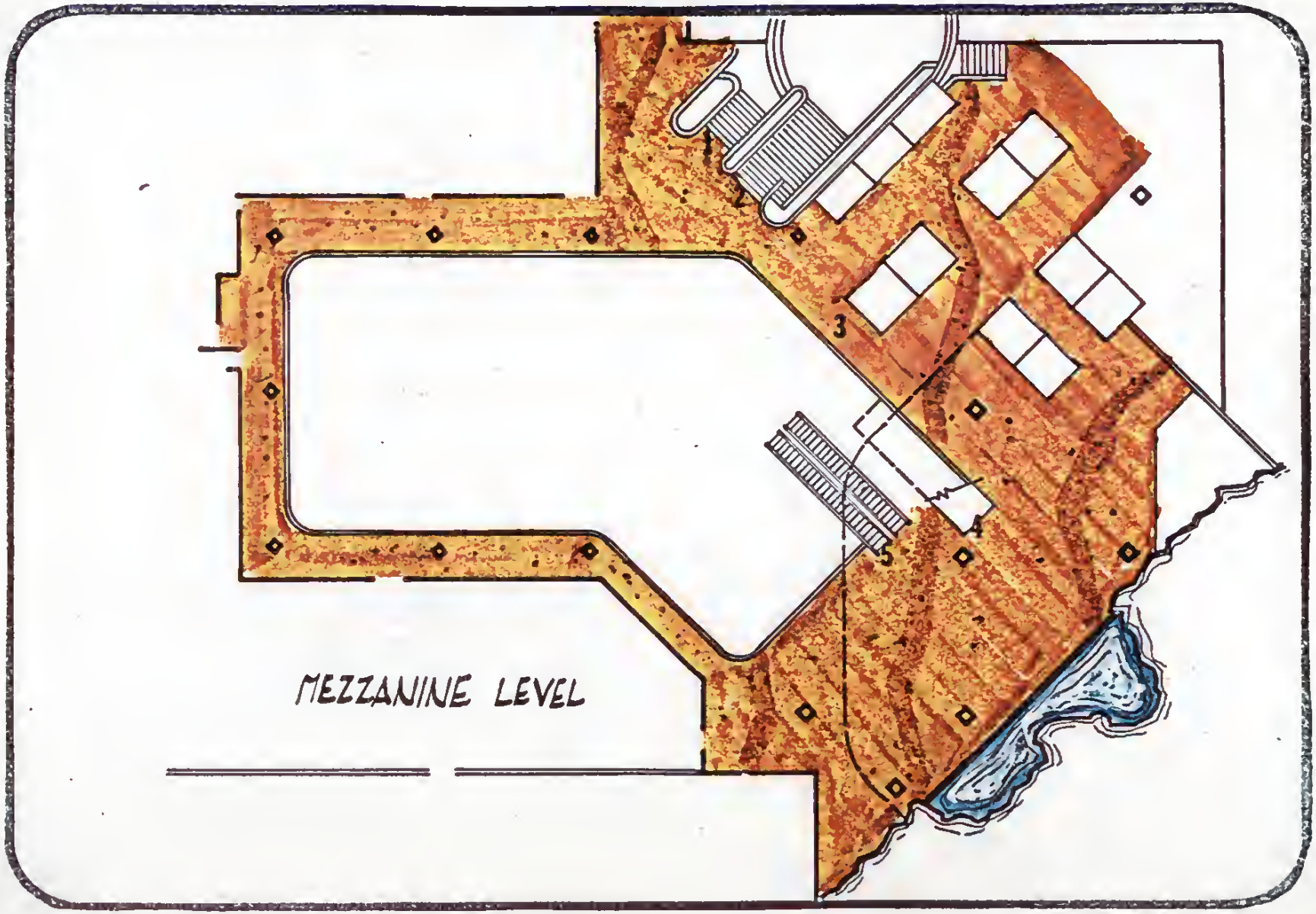


FIGURE 12e

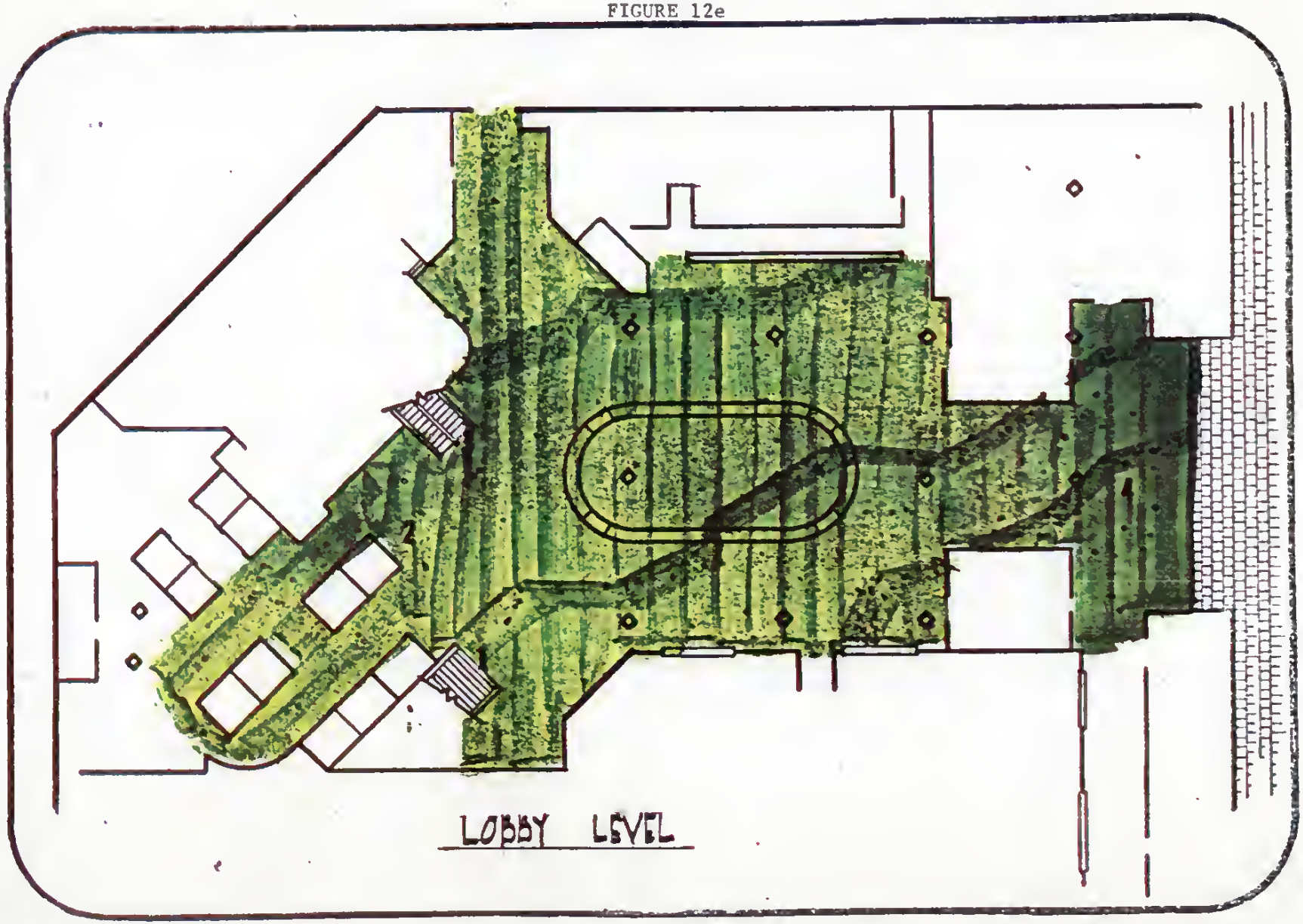
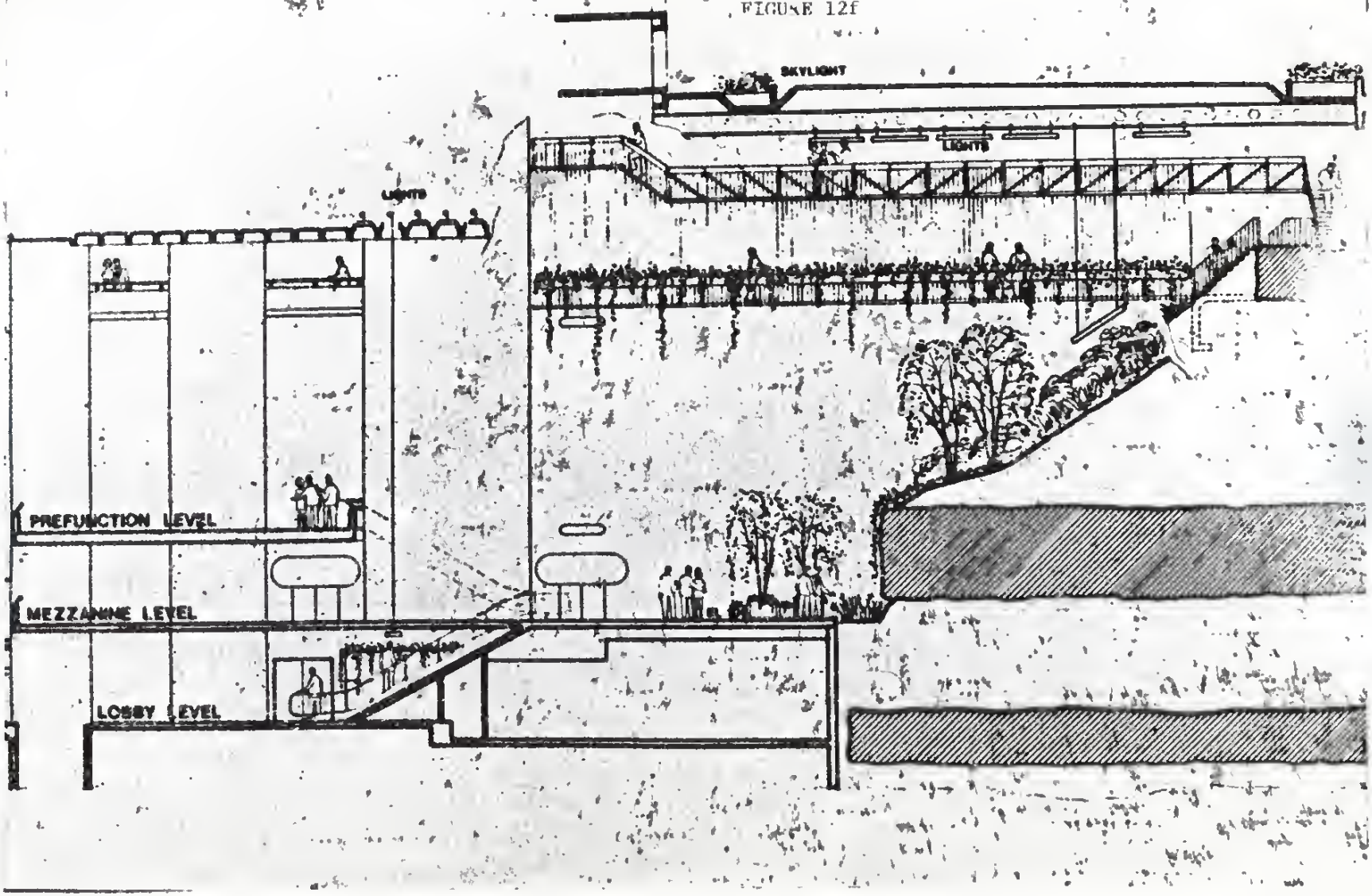


FIGURE 12f


SKYLIGHT
LIGHTS
LIGHTS
PREFUNCTION LEVEL
MEZZANINE LEVEL
LOBBY LEVEL

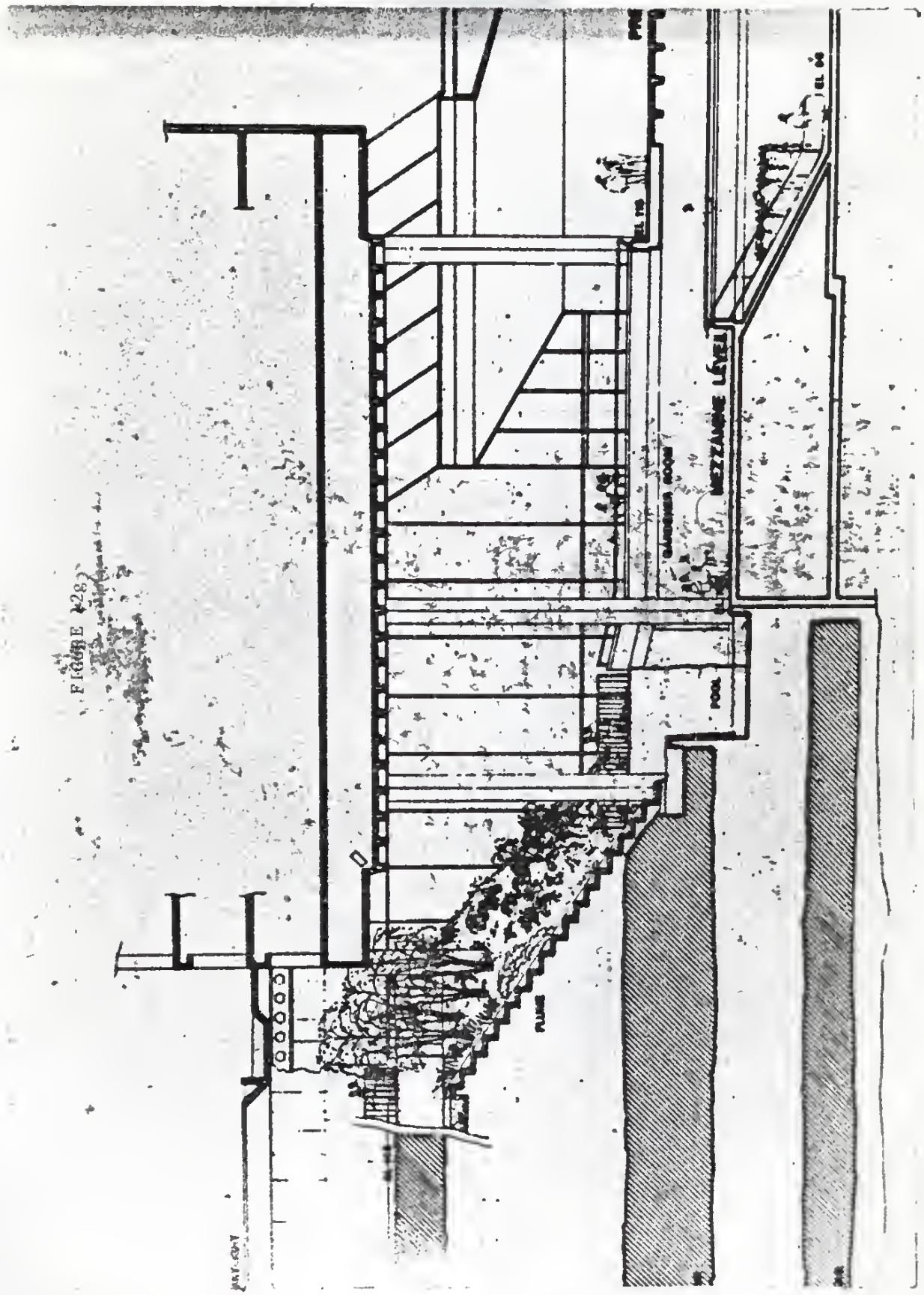


FIGURE 28

2. A 15-story L-Tower containing the 730 guest rooms standing atop the bluff so that the lowest guest rooms are 70 feet above the traffic.

The success the garden and related spsces has achieved, as described in the designer's conventional analytical fashion (Interiors, July, 1973, Vol. 132, pp. 48-67) will hopefully test the validity of P.C.E. by quantitatively checking the designer's focus assumptions against existing user patters and perceptions.

C H A P T E R I V

THE METHOD OF EVALUATION

SECTION A

DESIGNER'S "FOCUS ASSUMPTIONS"

SECTION B

PREFACE TO SURVEY TECHNIQUES

SECTION C

INTERVIEWS

SECTION D

INFORMATION FOR INTERVIEWERS

SECTION E

QUESTIONNAIRE

SECTION F

ETHICS

SECTION G

BEHAVIORAL OBSERVATIONS

DESIGNER'S "FOCUS ASSUMPTIONS"

The first step of a Post Construction Evaluation (P.C.E.) of the interior landscape is to determine how the interior garden, multi-levels and related spaces were intended to function. The evaluator first conducts a cursory review of the actual plan abstracting obvious intentions from it. Physical items in the environment, such as windows, benches, stairs, planters and access points serve basic functions in the space. Often the participants disagree with the designer's intended use, and utilize these elements by improvising to accommodate their own purposes.

The second step involves contact with designer (architect Harry Weese and Associates, Norman Zimmerman, job captain) to determine objectives design intent for the space in question. Use of a carefully prepared questionnaire is permissible; however, if possible, an actual interview is best. If a novice researcher attempts to draft the interview or questionnaire schedule, he should work closely with a competent individual in interview and questionnaire scheduling. In the author's situation, a pre-tested survey was obtained (a case study in P.C.E. that was undertaken by Albert Rutledge at the First National Bank Plaza in Chicago, Illinois) and was appropriately modified to fit the situation at hand. Physical distance made it impractical for the author to participate in a face-to-face encounter with the architect; however, an interview was successfully completed and criteria elicited via conversation with Mr. Zimmerman over the telephone (Table 2).

Eliciting the designer's assumptions by questionnaire should only be attempted with a proven questionnaire schedule and as a last resort. The reluctance to use the questionnaire over the interview is primarily

TABLE 2

ISSUE: POST CONSTRUCTION EVALUATION OF AN INTERIOR LANDSCAPE AND RELATED SPACES

PERFORMANCE CRITERIA

The landscape architect or designer of interior landscapes is actually an interventionist between the designed environment and the user, in which he is increasingly confronted with physical setting questions about what people want, how they will react and what they expect. With this physical environment, the designer controls the epatial arrangement of the setting which subsequently contributes to the shaping of individual etyles of life. The designers intervention may be major or minor, but whatever one does, it effecte ths livee of people and makes our role as deeigners of these environments highly critical.

Therefore, a systematic comparable and cumulative etudy should be coordinated of the spatial and related physical characteristics of an interior landscape (Crown Center Hotel), and of the effectiveness of that environment in supporting and sustaining human needs and valuee.

DESIGN SPECIFICATIONS

I. The total scheme of the interior garden and related spaces.
   1. The garden and waterfall were incorporated in the design to make the hotel unique among other hotels. This unique appearance entices the participants to use the hotel over other competing hotels.
   2. The garden was conceived to add excitement to the hotel and give the participants something to do while visiting. This excitement should be read as complex to the user by means of an increased sensory information rate, which may be defined as: the movement of the water, the sound of the waterfall, abundance of colors, uniquenese of the interior setting and excessive amount of green plants.
   3. Some areas in the hotel were primarily designed to allow the user a means of waiting for the functions to begin. During the users wait, one can look out and observe the garden, waterfall and participants below.

II. The top level or 5th floor of the interior garden.
   1. The top level or fifth floor of the interior garden should function as a lounge, primarily used by the pool and health club for sitting, relieving tension, paesing time and observing the garden and participants of the interior below.
   2. The top level or fifth floor of the interior garden should serve as a physical means of access between the sports deck and the sports club by means of the hanging corridors located on the east side of the site. The primary function of these hanging corridors should be for phyeical accese with observation of garden and participants below spontaneously occurring.

III. The interior garden and waterfall should function as:
   1. An integral part, with the garden becoming the background and the waterfall giving the participants in the environment a feeling of movement in the space.
   2. Integral parts by attracting one into the interior space with its scenic beauty and rushing water.
   3. A physical accees to the sports deck.

CONTINUED ON NEXT PAGE

TABLE 2 (Con't)

DESIGN SPECIFICATIONS

IV. The intermediate or pre-functional level should:
1. Allow the ballroom to function more adequately, by enabling the participants to utilize the space in front of the ballroom to look out and observe the garden, waterfall and participants. This type of activity gives the participant something to do while waiting for the functions to begin.
2. Serve as a physical access by means of the stairs, to the garden, upper level or fifth floor.
3. Function as a physical means of access to the Crown Center retail shop and square.
4. A physical access by means of the elevator to the hotsl rooms and fifth floor.

V. The mezzanine levsl should function as:
1. Transition zone between the natural rock garden and the formal ballroom. This should be accomplished by allowing ths garden to continue at the mezzanine level by using a stone fieldstone paver then changing to carpet, and then carpeting coming down the stairs.
2. A physical access by means of the elevator to the hotel rooms and fifth floor.
3. Means of connection for the activity blocks, within the hotel with Grand Avenus.
4. A means for passing time.

VI. The lobby level should function as:
1. A lounge to sit, relieve tension and observe spontaneous behavior of other participants.
2. A physical access by means of the elevator to the hotel rooms and fifth floor.
3. Tho point where the guests arrive in thc hotel.
4. A physical access to the Crown Center shops and square.

because an interview provides more detailed information and may often uncover unexpected information. The interaction may also allow for clarification and refined interpretation of meaning concerning focus assumptions.

The questions that were administered to the architect were open-ended, so as to determine the full extent of his attitude or perspective of the interior design (Table 3). To acquire the most pertinent objectives and "focus assumptions" central to the design concept, the questions that were posed were clear, short, and concise so as not to be misinterpreted. The short, quick answer is more critical concerning a questionnaire by mail compared to the interview; regardless, however, the designer is somewhat more reluctant to expend time if questions tended to be time consuming. Often the designer is reluctant to speak to the original design intent of a particular project thus leaving the evaluator to assumptions from the plans and an on-site visit.

Often, the designer does not have any set program from which to glean original design intent; therefore, other methods need to be employed to extract information such as visual feedback. One technique was suggested by Ostrander and employed the aid of a slide presentation of the completed project to be reviewed with the designer, thus enabling the designer to relate to the spaces by actually seeing them.

In the author's case, however, the physical distance (New York) made it impractical to utilize the technique of visual feedback in the evaluation. Alternative means of acquiring "focus assumptions" regarding the interior landscape were accomplished by complimenting the architect's criteria through interviews and questionnaires with others involved in

the design process (Keith Kelly; Vice President of Crown Center Redevelopment Corporation).

TABLE 3

QUESTIONS ADMINISTERED TO DESIGNER

1. Who specifically was the client on this project?
2. Who was involved during the design development stage? How would you describe your relationship?
3. What professionals were involved in the design?
4. What were the design criteria for the project?
5. Who established those criteria?
6. Who decided finally what would be included in the project?
7. Why were these things included?
8. Were there any special considerations or restraints imposed which were uniquely important to the final design (funds, city codes, etc.)?
9. Who did you expect to use the project? Why?
10. Would you please describe how you expected people to use the various parts of the site? How was this established?
    a. Total scheme of interior garden
    b. The top level of fifth floor
    c. The interior garden and waterfall
    d. The intermediate or pre-function levels
    e. The mezzanine level
    f. The lobby level
11. What special design considerations were necessary to satisfy the intended users and their activities?

12. Have you been to the site since it has been completed? Were people using the site as you had anticipated?
13. How do you feel about the site as built? How do you think the users feel about the aite?
14. What parts do you think function best? Worst?
15. Are there things happening on the aite which you had not anticipated, and feel should, or would have been designed for?
16. If you had the opportunity, would you change any parts of the site? Why?
17. Would you change the design procesa if you were involved with another project like this one?

PREFACE TO SURVEY TECHNICQUES

(Interview and Questionnaire)

A vast majority of the social science data that has been collected by and for architects has been obtained by the use of survey techniques such as interviews and questionnaires. These survey techniques suffer many methodological weaknesses, but the more crucial problem is that they have been used independently of any behavioral data to support the validity of their findings. Since there are numerous inconsistencies in these survey techniques, many researchers feel the method of triangulation, or the utilization of interviewing congruently with behavioral observation data, should be employed whenever possible. The interview technique was primarily chosen to be used as an exploratory device to help identify variables and relations, to suggest hypotheses, to follow up unexpected results, and to validate other methods. Without the support of behavioral data, many survey techniques should be viewed with question. This is mainly due to the various alternative explanations that are elicited during such measures as interviews and questionnaires. The designer subsequently does not know whether the results obtained directly correlate with the subject design or were due to the reactionary variables that are present during survey techniques. "Reactive" measures are those which allow the respondant to be aware that he or she is being measured or is the object of concern to the researcher. Reactive measurement may result in changes of behavior of the respondant.

These basic threats to validity that reside within "reactive" survey

techniques are noted by Webb.[23] Also, M. Fishbein, a noted researcher of attitudinal information, has found that there is no simple relationship between attitude and behavior when he states:

> "After more than seventy-five years of attitude reaearch, there is still little, if any, consiatent evidence supporting the hypothesis that knowledge of an individual's attitude toward some object will allow one to predict the way he will behave with some respect to the object. Indeed, what little evidence there is to aupport any relationship between attitude and behavior comes from studies ahowing that a person tends to bring his attitude in line with his behavior, rather than from studies demonstrating that behavior is a function of attitude."[24]

Before the development of an interview schedule, the researcher should contact some official in charge of the subject project to be evaluated. In the author's case study, the vice president of Crown Center Redevelopment Corporation waa first contacted (Keith Kelly), then the director of public relations for the hotel (Barbara Harlow) for the final confirmation. This procedure should be strictly adhered to for the mere fact that some administrators do not want to inconvenience their patrons with intruding surveyors. Usually, however, this stumbling block can be easily surmounted if the researcher has a firm grasp of post construction evaluation before approaching administrators for approval to use the survey technique on the subject project.

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[23] E. J. Webb, D. T. Campbell, R. D. Schwartz, and L. Sechrest, Unobtrusive Measures: Non-reactive Research in the Social Sciences, Skokie, Rand McNally, 1966.

[24] M. Fishbein, Ed., Readings in Attitude, Theory and Measurement, New York, Wiley, 1967.

INTERVIEWS

Although survey techniques such as interviews suffer weaknesses, they also contribute strengths. The use of an interview can provide detailed information of personal perception and may elicit unexpected information. Sometimes, the respondant clearly misunderstands the intent of a question, thus interaction with the interviewer can clarify matters thereby obtaining more accurate response. Such clarifications, however, must be strictly controlled, enabling the interviewer to remain neutral at all times. Further, the interviewer is placed in a face-to-face situation generally decreasing the number of "don't knows" and "no answers".[25]

The interview is a relatively quick and effective way of gathering a large body of information. It is flexible and can be carried out in the field with relative ease. Better control of the sample can be maintained (as compared to questionnaires), and less effort is necessary on the part of the respondant than in many techniques. Finally, when coupled with an appropriate schedule that has been pre-tested, interviews are a potent and indispensable research tool, especially with the aid of a computer.

The best instrument available in the author's particular case study, for sounding the participant's behavior, future intentions, feelings, attitudes, and reason for behavior, would seem to be the structured interview coupled with an interview schedule that includes open-end, closed,

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[25] F. Kerlinger, Foundations of Behavioral Research, New York, Holt, Rinehart and Winston, 1973.

and differential scale items. In the standardized interview, the questions, their sequence, and their wording sre fixed. An interviewer may be allowed some liberty in asking questions, but very little.

The first survey technique to be utilized in the author's evaluation is the fixed alternative (or closed). These items, as the name implies, offer the respondant a choice among two or more alternatives. The commonest kind of fixed alternative that is asked for is "Yes-No", "Agree-Disagree" and other two alternative answers. Often a third alternative or "Undecided" is added.[26] Examples of the author's fixed alternative items follow.

Fixed Alternative

1. Is this setting unique among other hotels you have visited?

   Agree
   Disagree
   Do not know

2. Do you feel the interior environment provides adequate waiting area?

   Agree
   Disagree
   Do not know

The second method of evaluation to be discussed in the author's case study is the open-end question, allowing the author to supply a frame of reference for the respondant's answers. The questions were composed in content, but no other restrictions on the content or response were imposed. If these open-end questions are properly written and used, they can become

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[26]Kerlinger, op. cit., p. 43.

a valuable tool in the designer's research. Open-end questions are flexible, having possibilities of depth and enabling the interviewer to clarify misunderstandings. Further, they enable the interviewer to ascertain a respondant's lack of knowledge, to detect ambiguity, to encourage cooperation and achieve rapport, and to make better estimates of respondant's true intentions, beliefs and attitudes. Another positive aspect of open-end questions are suggestions of interacting relations and hypotheses. Respondants will sometimes give unexpected answers that may indicate the existence of relationships not originally anticipated.

1. What component(s) in this setting make the interior environment unique?

2. In your estimate, what is the primary purpose of this level?

3. For what reason(s) did you come here today?

    a. pool
    b. health club
    c. sports deck
    d. observing garden and people below
    e. business
    f. relieving tension
    g. other _____

The above answers (a-g) should not be administered to the interviewee for reasons of bias, but rather as a means of extracting clear use patterns and purpose.

The third and last technique of interviewing used by the author on the evaluation of the interior landscape included the utilization of the semantic differential scale. This included a set of bi-polar verbs which described the interior setting. The interviewee was asked to respond by expressing degrees of how the interior effected them by means of check on

the form. Scale items relate fixed alternatives by degree and are very appropriate to systematic eliciting of valuable criteria. An example of the scale technique used in the evaluation is shown on Table 4.

TABLE 4

SAMPLE RESPONSE SCALE

1. This setting can be interpreted emotionally in several different ways. Using the words below, rate how you perceive the interior environment.

Happy	___ ___ ___ ___ ___	Unhappy
Exciting	___ ___ ___ ___ ___	Calming
Stimulating	___ ___ ___ ___ ___	Relaxing
Satisfying	___ ___ ___ ___ ___	Unsatisfying
Relaxing	___ ___ ___ ___ ___	Boring

2. The components of this setting produce mixed reactions among different individuals. Using the words below, rate how you perceive the interior environment.

Usual	___ ___ ___ ___ ___	Unusual
Simple	___ ___ ___ ___ ___	Complex
Common	___ ___ ___ ___ ___	Rare
Varied	___ ___ ___ ___ ___	Redundant

INFORMATION FOR INTERVIEWERS

To help insure randomness in the sample and validity of the data elicited, the author's aim was to interview participants at different locations on the site as well as to interview a variety of user types in the interior environment. This was most successfully accomplished by using the station selection chart illustrated on page 82.

The first objective considered is the proper design of questions. If the questions have been drafted inadequately in relation to the designer's "focus assumptions" pertaining to design intent, even the most skilled interviewers will not be able to collect valid and useful data. To benefit the interviewer, seven criteria have been developed through experience and research to help draft an adequate interview question schedule.

1. Is the question related to the research objectives?
2. Is the type of question designed to extract necessary information and is it appropriate to the situation?
3. Is the item clear and unambiguous?
4. Is the question leading?
5. Does the question demand personal or delicate material that the respondant may resist?
6. Does the question demand knowledge and information that the respondant does not have?
7. Is the question loaded with social desirability?[27]

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[27] Kerlinger, op. cit., pp. 473-475.

These criteria are only intended as an introduction to interview scheduling and the researcher should seek competent assistance in this area. An example of how the designer's criteria were properly elicited by an interview schedule follows:

Designer's Criteria or "Focus Assumptions"

The garden and waterfall were incorporated in the design to make the hotel unique among other hotels. This unique appearance entices the participants to use the hotel over other competing hotels.

Interview Schedule

1. Is the setting unique among other hotels you have visited?

   Agree
   Disagree
   Do not know

2. What components in the setting make the interior environment unique?

3. Why did you select this hotel over other competing hotels?

Designer's Criteria or "Focus Assumptions"

Some areas in the hotel were primarily designed to allow the user a means of waiting for functions to begin. During the user's wait, one can look out and observe the garden, waterfall and participants below.

Interview Schedule

1. Do you feel the interior environment provides adequate waiting area?

2. If you were waiting for activities to begin, where would you wait? Why?

After the interview schedule had been completed and determined acceptable to the forthcoming task, the author intimately familiarized himself with the questionnaire, so as to receive an unlabored response from the respondant. If the interviewer errs in using the questionnaire and is forced to read it two or three times, invalidity of response is almost certain. Ultimately, the questionnaire should be administered to respondants without error, so as to elicit an accurate, quick, unlabored response.

Before the questioning, the author informed the respondant as to his identity, the nature of his inquiry and asked politely if a few minutes of their time could be spared to obtain some of their ideas pertaining to the interior landscape. One of the first rules in successful interviewing is to create a friendly non-forced atmosphere from the outset. This is necessary to put the respondant at ease, since the interview will be prying into the respondant's personal attitudes. The author attempted at sll time to allow his personality to remain flexible during the interviews, keeping the respondant comfortable in the given situation. Once the interviewer has begun with the quesioning, one should not even slightly change the wording of the given question, thus leading the respondant. Allowing "bias" to infiltrate into the survey will invalidate the interview technique.

The author's case study chose to use a standardized interview, which facilitated efficient recording of answers. The standardized method allows the evaluator to specify exact information needs and methods used to obtain it. Also, since the questions were written in advance, the

skill needed to successfully complete the interview was minimal. Moreover, the possibility of the author introducing his own bias is minimized, since he does not depart from the prescribed questions. Once the cost in time, energy, money and skill required for the development of the interview criteria are surmounted, the structured interview should prove to be a powerful tool in behavioral research, when used congruently with unobtrusive behsvioral research.

It is frequently necessary to probe for answers that will be sufficiently informative for analytical purposes. In every case, however, it is imperative that such probes be completely neutral. The probe must not in any way affect the nature of the response. Whenever a researcher anticipates that a given question may require probing for appropriate responses, useful probes next to the question in the questionnaire, such as "How is that?", "In what way?", or "Anything else?" sre helpful. Sometimes, the best probe is silence. If the interviewer sits quietly with pencil poised, the respondant will very often fill the pause with additional comments. A simple repetition of the question with proper emphssis, may also suffice to get an overall response in satisfactory terms.[28]

Before the actual interviews were undertaken, the author practiced the questionnaire on individuals in the classroom and the field. The participants interviewed on the pre-test should be similar in characteristics to those who will be interviewed in the final study. This pre-test

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[28]C. Selltiz, Marie Jahoda, Martin Deutsch, and S. W. Cook, Research Methods in Social Relations, New York, Holt, 1959, pp. 171-185.

is a simple tryout of the quesionnaire to see how it functions--and determine whether necessary changes and refinement before undertaking the actual interviews. A valuable part of the pre-test interview that the author utilized was a discussion of the questions with respondants after they had answered them. The respondant was asked what the question meant to him or her, what difficulties were experienced in replying, what further ideas were brought out by the question, how he or she would ask the question, what feelings were invocated on fixed answer questions, etc. Also, respondants should not be told that they have been selected for a practice interview as such indication will destroy the realism of the practice.

An additional technique the author utilized in regard to the pre-test was the recording of observations, criticisms, and suggestions. Example observations included: What points seemed to cause embarrassment or resistence?, Where did one have trouble retaining rapport?, Did the respondant become bored or impatient?, On what questions did the respondant request further explanation?, Was there enough space for recording answers?. If substantial changes are necessary to the degree of adding new questions, a second pre-test should be conducted.

The nature of the author's survey warranted approximately five practice interviews in the field on each level, although the more general rule is that every interviewer must complete enough practice interviews to demonstrate that he fully understands the procedure.

The aforementioned principles of interviewing only make a cursory review of the important elements of an effective interview procedure and

are only intended to help the researcher to grasp some general principles of interviewing. If the researcher does not feel proficient in the field of interviewing, he should employ the use of a competent individual to help set up the interview schedules and give finite details concerning the art of interviewing pertaining to the particular situation.

The author complemented his interviews with behavioral observations of users in the interior garden environment. The questions were designed (Appendix) to elicit pertinent information concerning the project, yet only require a few minutes of the respondant's time. The author conducted observations independently of the interviews, in hope that the observation would allow the formation of objective follow up questions.

QUESTIONNAIRE

The reactions that the interviewee elicited can easily be biased. That problem also applies to written questionnaires. The written questionnaire has certain advantages. Most or all of its items are of the closed type giving greater uniformity of stimulus and thus, greater reliability. Next, its cost is economical; ordinarily a fraction of the cost of an interview. A third advantage is that it is anonymous which encourages honesty and frankness. A written questionnaire may be mailed to large numbers of people with relative ease. However, this method was not applicable in the author's situation since a large population did not need to be polled.

In the author's situation, the disadvantages of the written questionnaire seem to out-weigh its advantages. The major problem with the questionnaire would be the low percentage of returns. A second disadvantage is that it may not be as uniform as it may seem. Experience has shown that the same question frequently has different meanings for different people. This fallacy may be dealt with appropriately if an interview is undertaken, but one is powerless to do anything about it when the questionnaire is self-administered. Third, if only closed items are used, the questions cannot reach a point below the response surface without sufficient probes. The items may irritate a respondant who finds none of the alternatives suitable. A more common concern is that the items can force responses. A respondant may choose an alternate to conceal ignorance. He may also choose alternatives that do not accurately represent true facts or opinions. On the other hand, if open items are used, the respondant

may object to writing the answers. This, in turn, reduces the sample of adequate responses. Many people cannot express themselves adequately in writing, and many who can express themselves, dislike doing so.[29] Because of these disadvantages, the interview seemed superior to the self-administered questionnaire, especially with regard to the author's case study.

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[29]C. Selltiz, Marie Jahoda, Morton Deutsch, and S. W. Cook, Research Methods in Social Relations, New York, Holt, 1959.

ETHICS

Often, as in the case of the author, the researcher must observe the participants in the environment without their knowledge of being recorded. The observational techniques that each researcher selects to operationalize, should contain some amount of forethought in the area of ethics. Ethics are interpreted in different ways as researchers place their values into the situation. For instance, E. A. Shils would rule out any research that involved observing private behavior without full and informed permission of the person being observed.[30] Yet, on the other end of the spectrum, researchers utilize measures during their research which involves trespassing and invasion of privacy, so as to minimize the reactivity that may infiltrate into the procedure. The author chose to take a mean or average position with regard to these two extremes. The procedure used will be described later.

The American Psychological Association has proposed ethical standards for research involving human subjects that are applicable to the author's situation for unobtrusive observation.[31] This report, by Cook, basically states that if the evaluation can contribute to the users satisfaction, then the researcher should continue the procedure as best as he knows how within legal limits.

The preceeding standards are principals and should not be interpreted

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[30] E. A. Shils, "Social Inquiry and the Autonomy of the Individual" in D. Lerner, Ed., The Human Meaning of Social Sciences, Cleveland, Mekidian Books, 1959, pp. 114-157.

[31] S. W. Cook, "Ethical Standards for Research with Human Subjects" APA Monitor, (May, 1972).

as hard fast rules. The primary premise that was observed during the author's evaluation involved anonymity. The observant's anonymity was important in preserving the subject's natural behavior. If the subject knew he was being observed, he may alter his behavior. His attention would focus on the observant rather than his environment.

BEHAVIORAL OBSERVATIONS

Unobtrusive behavioral observation procedures employed in some aspects of the social sciences may be adopted as an indirect means of user response. The techniques provide a systematic way of observing behaviors in the landscape. In the past, architects have relyed on unobtrusive observation as their primary evaluatory tool. This type of measurement is very good, but cannot be of any substantial validity unless it is compounded by quantitatively checking the environment with the survey techniques previously mentioned.

The designer in his quest to eliminate the reactive nature of survey techniques, has gone to great pains to construct beautiful scale models and use proctoscopes as methods to resolve some of the problems that may confront the user prior to the implementation of the design. Too often, the designer does not grasp the difference between model and reality. The critique that is implemented upon the model is purely physical with little forethought being given to the primary component (people) missing in the design. The Landscape Architect should attempt to focus more of his criteria on the participants in the interior environment and not entirely on how aesthetically pleasant it appears.

The researcher must use caution in the selection of the unobtrusive devices he uses during his evaluation. Every environment demands different combinations of observational techniques to properly elicit the pertinent data within the project. In the case study, each of the designer's criteria must be independently evaluated per level. The researcher should determine which unobtrusive observational technique, if any, should be coupled with

the designer's individual criteria to ascertain its effectiveness in satisfying the original goals.

The unobtrusive devices are primarily broken down into three separate categories as described by Webb and include 1) physical traces, 2) archival records, and 3) observational data.[32] Each of the preceeding categories shall be discussed independently and evaluated on its relevance to the interior landscape of the Crown Center Hotel.

The First category to be discussed is that of physical traces, which divided into two categories: erosion and accretion. Erosion may be defined as the constant wear on some material which yields the measure (example, the erosion of wood upon steps where people frequently walk). This technique could be implemented by the researcher by simple observation of the site and the abstraction of these obvious signs. Since this method was relatively simple and could possibly yield valuable data, the author decided to utilize this technique. From this method, one may determine which parts of the design are functioning best as well as how the design is being used. An example of the technique would be the wearing away of floor tiles or carpet around the more popular spaces in an interior environment. The garden level is an excellent example in the author's case study, since wooden steps were used for physical access to the garden, sports deck and fifth level. This may inform the researcher which components in the garden are receiving more attention and if the physical access is actually being used by the participants. However, erosion may be difficult to

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[32] E. J. Webb, D. T. Campbell, R. D. Schwartz and L. Sechrest, Unobtrusive Measures: Nonreactive Research in the Social Sciences, Skolie, Illinois, Rand-McNally, 1966, p. 35.

use since the case study is only four years old.

The second measure which may be correlated to physical traces is that of accretion. Accretion may be accomplished by aimply observing traces of past behavior that people have deposited.[33] This technique was also utilized by the author to aid in the evaluation of the interior landscape. This technique was implemented by making inspections of waste baskets on the project to abstract a clue from the environment as to the origin of the participant's movement. One of the problems that could be encountered by the use of physical traces only as an observation technique, ia called aelective survival. This simply means that some remnants are allowed to aurvive while others are not. This could affect the results of the research.

The second means of unobtrusive behavioral observation that is available to the reaearcher is called archival recorda. These are divided into two primary categories which are running records and episodic records.

Running records are continuing records of society. There are four general categories of running records: government, actuarial, mass media, and political and judicial records. The first category of running records to be discussed ia government records. This method is usually accomplished by measuring some variable auch as water consumption, power consumption, parking meter receipts or any other variables that are available. Thia method was not applicable to any of the design criteria that Harry Weese & Associates (designers) had established for the project. Consequently,

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[33] Webb, op. cit., p. 38.

the method was deemed not feasible for the author's evaluation.

The actuarial record, which is the second type of running record, includes such records as marriage, birth and death certificates. Researchers may study certain aspects of the surrounding community by determining who moves in and out of the neighborhood, who marries whom, or who has children in order to determine if the project is having a positive or adverse influence on the community. The author's case study dealt with the interior environment exclusively. Therefore, this procedure was discarded in favor of more logical approaches.

Mass media comprises the third category of running records. These include events recorded on television and radio, in the newspapers, and in magazines. They can be of great interest to the researcher. News items can provide a wide assortment of information that would have been helpful to the author. However, because of physical distance, information could not be easily retained which was relevant to any of the established design criteria. Consequently, this technique was not extensively employed.

The final category of running records involves political and judicial records. An example of this would be the utilization of voting records. The author's situation was not compatible with political and judicial records for there were no feasible means of applying the data to the designer's specific criteria given in the interior garden environment.[34]

The second type of archival records are episodic and private records. There are generally not continuous in nature and usually not part of the

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[34] Webb, op. cit., p. 40.

public running record. The primary difference between running records snd episodic is that the latter is not available over a certain amount of time, and are recorded only for specific instances. There are three general categories which may be drawn from episodic and private records, all of which may be used in place of direct observation and measurement of behavior.

The first to be discussed include industrial and institutional records. These pertain to business and personnel records. In industrial settings, one can draw upon numerous archival data that could be of use in evaluating how physical design effects human behavior. The productivity of the workers, their absenteeism rates and the distance they choose to live from the project, could all serve as measurement devices to determine the success of the design. However, these are more applicable, informative and useful in such settings as industrial and institutional facilities, and did not in the suthor's case study correlate with the designer's criteria.

A second type of episodic archival records include personal documents. When letters may be obtained concerning the project without prior knowledge of the writer, one may sssume the letters are non-reactive in nature. This unobtrusive method of studying people's reaction to s design may yield valuable data if the researcher is imaginative enough. This method is not easily obtainable and one should remain sensitive to the participant's legal rights when trying to obtain this data. This method proved to be impractical in the author's situation, since no personal documents could be legally obtained.

The third and last category involved with episodic archival records consists of sales and records. The items being sold, the volume of sales,

and the current price sale are excellent unobtrusive measures of behavior. This type of research is generally conducted with stores that retain interior environments.[35] The amount and type of items purchased from the environment is an indication of its meaning for the researcher. This technique, although valuable in one setting, is not pertinent in the author's situation.

Archival data is non-reactive in nature, but eliminating the reaction of the participant does not give the method a foolproof safeguard. There are primarily two sources of bias that are ever present when dealing with archival records. These are selective recording and selective survival. Selective recording, as the name implies, has to do with what data gets recorded and which does not. Selective survival may negate a measure, by means of data being stricken from the record books. When researchers are using archival records to validate data, one must be fully cognisant that this bias does play a role in this type of data collection.[36] Despite the problems, archival records offer the researcher a large body of data that is reasonably cheap and easy to obtain.

The third category of unobtrusive devices is that of observational data and technique. In some instances, a researcher may be forced to withdraw from the passive investigator role as a means of data collection and assume a more active role. In non-reactive observation, it is the responsibility of the researcher to play a non-intrusive role in the interior envi-

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[35] Webb, op. cit., p. 41.

[36] Webb, Ibid., p. 42.

ronment, while simultaneously recording data. It is important that the researcher remain unknown and unobserved by the subjects.

While gathering observational data, the researcher should realize some of the positive aspects of these measures: 1) the data that the researcher collects is firsthand, unlike archival records, 2) the supporting data may be collected at the same time, consequently eliciting facts that are more representative of the actual situation at that particular point in time, 3) if additional data is deemed necessary, the researcher may contact the participants involved and appropriate information, 4) the data serves a formulated research purpose, 5) the data is planned systematically rather than occurring haphazardly, and 6) the data is subject to checks and controls with respect to validity, reliability and precision much as is all other scientific evidence.

Of the unobtrusive measures presented so far, the last method of observation appears to be the most beneficial to the Landscape Architect in eliciting the designer's criteria. For this procedure to remain valid, the observer must remain anonymous in the environmental setting while amassing data to be used in documenting the behaviors exhibited. Simple observation, as the name implies, is easily accomplished by the observer who displays a passive unobserved role in the environment while submitting no control over the behavior being studied. In contrived observation, the researcher plays an active role in manipulating the setting to be observed and often uses hardware to aid in observing and recording behavior.

Before the discussion of observation data and techniques, one should become cognisant of researcher participation. This method of observation

allows the researcher to actually participate in the environment and gain first-hand knowledge of the design being evsluated. The major drawback with this method is that it allows the researcher to put his values into the forthcoming research and his reactions may "bias" the outcome. Therefore, if the researcher does utilize this practical technique, one should allow for possible contamination of reactivity entering into the research and utilize various other techniques to validate the outcome. This method was simply accomplished in the author's situation by participating several hours at each level of the interior garden setting and noting the behavioral impact it exhibited at the time. The major drawback in this situation, is that the time consumed on the multiple levels used in amassing the information could be economically unfeasible in other evaluations.

Webb begins by dividing observation techniques into two separate categories. The first technique is simple observation, and the second is contrived observation. There are many avenues open to the imaginative researcher when one chooses to use simple observational techniques. When one examines a population sample, for instance, the participants in the design exhibit distinguishing characteristics by their mode of dress. A researcher may use these clues to depict what "type" of individuals there are on the scene at a particular moment (Table 5). This was beneficial in the author's evaluation in determining which of the participants in the hotel were tourists or shoppers as opposed to residents of the hotel. Besides the aforementioned "type", the author also drew conclusions pertaining to the participant's sex, age, and race. The reason for making this assumption was to exemplify whom the interior garden was actually "drawing" or

TABLE 5

USER TYPES

RESIDENT	BAGGAGE
WHITE COLLAR	COAT & TIE, SKIRT
BLUE COLLAR	INDUSTRIAL UNIFORM
SHOPPER	SHOPPING BAGS
TRANSIENT	DISHEVELED
FREAK	LONG HAIR
TOURIST	CAMERA

attracting. This was important since during the interview, some of the individuals polled were elderly individuals, primarily in the lobby, who were just passing the time of day. Since some pieces of furniture were not permanently affixed in the Hotel, the author could possibly elicit facts from the interior by observing how the participants were arranging the furniture. One must conclude by determining if the furniture was in the same place the designer assumed it to be.

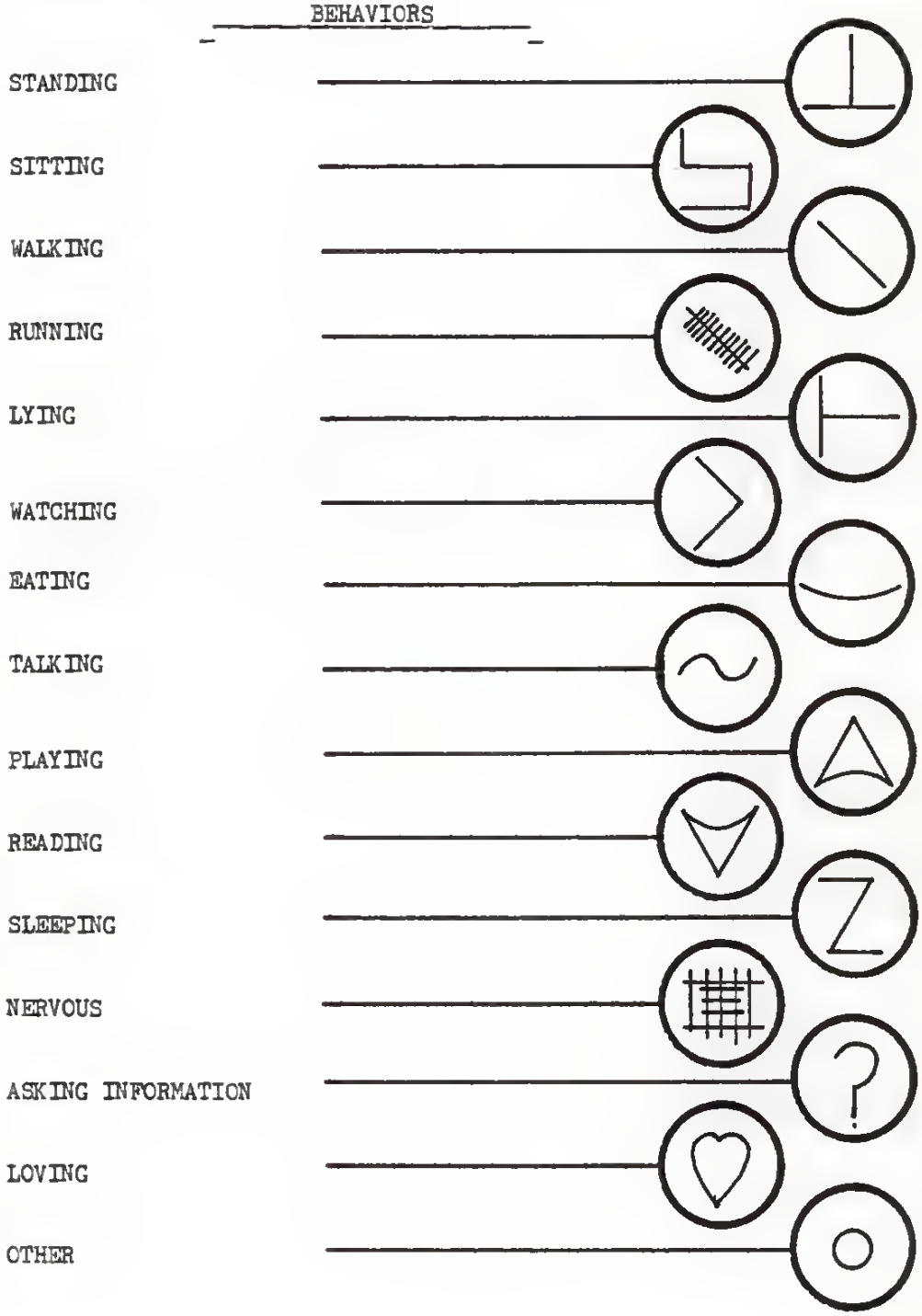
A second simple observational technique is often exhibited in the form of body language. Body language was satisfactorily interpreted by R. L. Birdwhitell in his research on kinesics. Kinesics involves the non-communicational values of learned patterned behavior. Non-verbal communication may be applied to many problems. For example, in the author's case study, the top level and lounge were designed for relaxing. If nervous behavior is being exhibited, then the space is not achieving its desired outcome and should be systematically diagnosed and recorded, from the anticipated list of behaviors (Figure 13).

Often, an alert researcher may elicit data by observing to what the participants have given attention and amount of time they have spent there. This is primarily an indicator of interest and shows which design features are functioning to the optimum. The author's situation allowed this technique to be employed by simply recording the duration of attention and the activities that were occurring (from an anticipated list of behaviors, Fig. 13) while in the Hotel.

Often a Landscape Architect may gain valuable knowledge pertaining to the site by means of conversation sampling. The author easily accomplished this by unobtrusively observing what people were saying to each other.

FIGURE 13

BEHAVIORS



Often researchers can accumulate varied reactions about the project which are not reactionary and if observed and recorded correctly, can be a valuable asset in the evaluation process.

The aforementioned method was coupled with, in the author's case study, a behavioral mapping technique to list representative behaviors that were occurring on each level in the Hotel. This method showed how the designer intended the level to function and how the participants were actually utilizing the space.

The second principal observation technique is that of contrived observation. This is generally employed by using hardware such as camera, movie, video instruments and audio tape recorders to help facilitate the data gathering process. The major advantage of utilizing this method is that it enables the observer to fully extract all the information from a particular scene at one instant in time, if all conditions on the project are favorable. Although this is a definite advantage in a research based P.C.E., this method is not without error. One of the main disadvantages with the audio and video instruments is the expense involved. Besides the cost, the camera often requires high vantage points, which are often unavailable. Even when high vantage points are available, the physical distance required to obtain a panorama of the design makes clear visibility difficult. Many times the observation space may be partially negated by an obstruction, which consequently decreases the value placed on the method.

Of the simple observational techniques, the author chose to combine the procedures into two phases. The first phase consisted of Researcher Participation utilizing a combination of the techniques of erosion,

accretion, and conversation sampling of abstract clues from the environment. These techniques were selectively chosen for this project because it was felt that they were the moat efficient means of securing a competent evaluation.

The second phase of the simple observational techniques used by the author consisted of a behavioral map. The author traced the movementa of the participants as well as their duration of attention and physical characteristics. Along with the behavioral mapping, the author used a 35mm camera for general illustrative purposes.

The first phase proceeded by first addressing each level independently with the simple observational techniques discussed above. As suggested by Hallmark, one Saturday and a weekday were selected to cover a representative amount of days. This would subsequently produce data that would enable certain parts of the evaluation to be comparable in nature. The first phase lasted approximately two hours allowing the researcher to implement the firat phaae of Researcher Participation upon the specific level. The second phase lasted six hours during the week and one hour and a half per level on the weekend so the observational phase of the evaluation could be conducted completely within a reasonable time limit (one week). The researcher's participation is vital and there are certain steps that should be followed to insure accuracy in data collection. These steps are:

1. The researcher's mode of dress effects the outcome of the phase tremendously if the participant physically perceives the researcher as an alien in the space. Conversation sampling may be hindered drastically if

the researcher's attire creates a negative reaction on the part of the participant.

2. Review the designer's criteria and ascertain whether these techniques would be compatible in evaluating the effectiveness of the design. (Example: will erosion determine if the interior garden should function as a physical access to the garden, sports deck and fifth level.)
3. Photograph and/or record each of these physical traces or conversations that are pertinent to the designer's criteria on a sheet of the site.
4. A 35mm camera should always be ready to capture general illustrative shots of the site. A high speed film should be used for the indoor setting (ASA 400 or 160).

During the second phase, the time of observation should be recorded on the data sheet. As many observations as possible should be recorded during the hour in order to result in six different one-hour interval maps. The 35mm camera should also be ready during this phase to record general illustrative pictures of the participant reacting to the interior environment. It is important that the steps below be followed during the second phase to insure accuracy in data collection. These steps are:

1. When using Behavioral Mapping, the researcher should first refer to the station selection chart (see Table 6) for point of beginning and which participant to follow.

RANDOM STATION SELECTION CHART

"LOBBY"

2/5	2/1	3/5	1/1	2/1	2/4	1/5	3/5	1/4	4/3
1/4	1/3	3/2	2/5	3/4	2/5	3/4	4/1	4/4	1/3
1/4	3/1	4/3	4/3	1/5	2/5	1/5	4/1	1/1	4/1
3/3	4/4	4/5	4/4	1/2	2/5	2/1	1/4	1/5	4/5
4/1	3/1	3/1	4/2	3/2	4/5	3/2	4/3	2/4	2/4
2/2	2/1	3/5	1/1	2/1	2/4	1/5	3/5	1/4	4/3

"MEZZANINE"

5/1	5/3	3/5	2/2	3/3	4/5	5/1	4/3	5/2	2/4
5/5	5/3	3/5	1/1	2/2	5/4	1/3	5/2	4/5	2/1
5/2	1/4	3/5	5/2	1/3	1/3	2/1	3/2	3/5	5/2
2/4	3/2	1/2	1/3	3/4	5/1	1/3	1/5	5/1	1/2
2/4	5/1	1/1	4/3	3/3	1/2	2/5	3/5	3/4	4/3
5/1	5/3	3/5	2/2	3/3	4/5	5/1	4/3	5/2	2/4

"PREFUNCTION"

5/1	5/4	3/5	2/2	3/3	4/5	5/1	4/3	5/2	2/4
4/5	5/3	3/5	1/1	2/2	5/4	1/3	3/2	4/5	2/1
5/2	1/4	3/5	5/2	1/3	1/3	2/1	3/2	3/5	5/2
2/4	3/2	1/2	1/3	3/4	5/1	1/3	1/5	5/1	1/2
2/4	5/1	1/1	4/3	3/3	1/2	2/5	3/5	3/4	4/3
5/1	5/4	3/5	2/2	3/3	4/5	5/1	4/3	5/2	2/4

"GARDEN"

3/2	2/5	1/1	3/1	2/1	2/5	3/5	1/5	3/3	1/4
1/2	3/4	1/1	3/4	2/1	3/2	1/1	3/4	2/1	1/4
3/2	1/1	1/2	1/1	1/2	3/5	2/4	1/5	3/2	2/4
1/1	1/3	3/5	3/3	3/4	2/4	3/5	2/2	3/2	2/5
2/1	1/1	1/4	1/4	1/1	3/4	2/4	2/5	1/4	2/3
3/2	2/5	1/1	3/1	2/1	2/5	3/5	1/5	3/3	1/4

"TOP LEVEL"

1/2	2/5	1/1	2/1	2/1	2/5	1/5	1/5	2/3	1/4
1/2	1/4	1/1	2/4	2/1	1/2	1/1	2/4	2/1	1/4
1/2	1/1	1/2	2/1	1/2	2/5	2/4	1/5	1/2	2/4
1/1	1/3	2/5	1/3	2/4	2/4	1/5	2/2	2/2	2/5
1/1	1/1	1/4	1/4	1/1	2/4	2/4	2/5	1/4	2/3
1/2	2/5	1/1	2/1	2/1	2/5	1/5	1/5	2/3	1/4

Assuming that data was being collected in the lobby area, the researcher's initial key, according to the selection chart, would be 2/5. This would imply that the researcher follow the fifth person that came into the #2 entry. The person's actions would be recorded until he left the space.

2. The participant's cumulative time in the interior environment should be recorded.
3. Each map should have recorded on it the participant's exterior physical characteristics (sex, age and type).
4. Movement and activity of each subject should be recorded graphically on the behavioral map (see Fig. 13).
5. Time each major behavior and record in the area adjacent to the symbol on the map at each given station. If the subject as indicated on the station selection chart does not appear within three minutes, then follow the next subject. If no participant appears within a five minute span, then go to the next station.
6. When a researcher enters a site for behavioral mapping, he should try to select a place on the site that gives full vantage of the site while he remains unobtrusive. One may reduce the obtrusiveness on the site by adapting to the mode of dress of the participants. In the author's situation, the participant's attire was usually coat and tie, and when the author dressed accordingly, he remained unobtrusive.

CHAPTER V

DATA POOL

SECTION A

BEHAVIORAL MAPS

SECTION B

INTERVIEWS

BEHAVIORAL MAPS

The behavioral maps shown in this chapter are representative examples of those used during the evaluation. The upper most level of the interior space of the hotel on Figure 14 forms a space between the exterior pool and the interior garden. The bridge on this level allows the participants access via the elevator.

The garden level on Figure 15 is a five-story garden beginning at the mezzanine level and ending at the top level. The garden has a waterfall which begins at the top of the garden and cascades down to the mezzanine level.

The prefunction level on Figure 16 is an open interior space oriented toward the garden to allow the participants something to view prior to hotel functions.

The mezzanine level on Figure 17 is the point which the interior garden and waterfall end and serves as a space in which participants are able to stand or sit to look up at the five-story garden and waterfall.

The lobby level on Figure 18 serves as the point to greet the participants upon entering the hotel. This level is one level below the mezzanine level, but still allows participants to view the waterfall and garden.

FIGURE 14

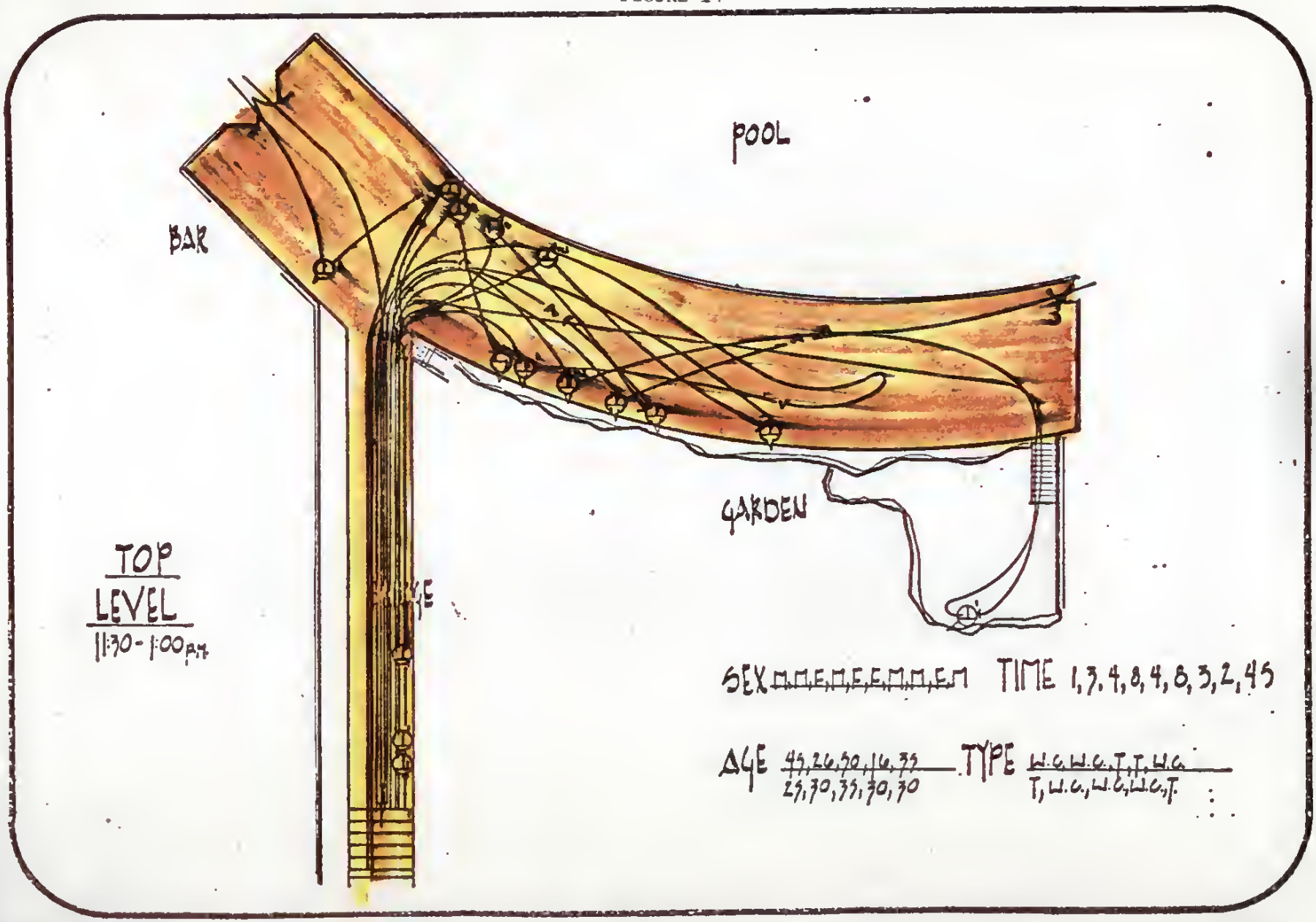

POOL
BAR
GARDEN
TOP
LEVEL
11:30 - 1:00 P.M.
SEX M,M,F,M,F,F,M,M,F,M TIME 1,3,4,8,4,6,3,2,45
AGE 45,26,50,16,35 / 25,30,33,30,30 TYPE W.C, W.C, T, T, W.C / T, W.C, W.C, W.C, T

FIGURE 15

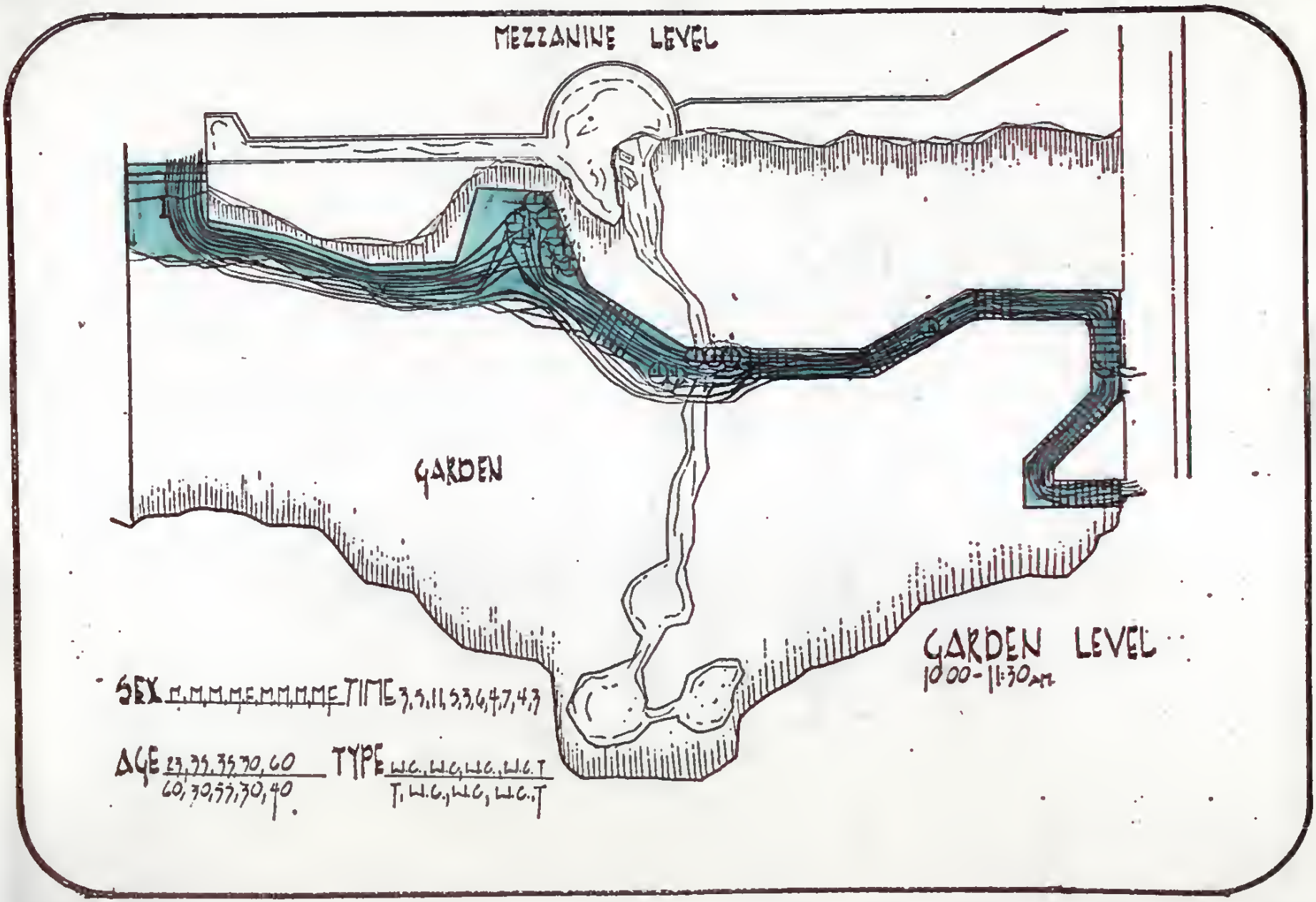

MEZZANINE LEVEL
GARDEN
GARDEN LEVEL
1000-1130 AM
SEX M,M,M,M,F,M,M,M,M,F TIME 3,9,11,5,3,6,4,7,4,3
AGE 23,35,35,70,60 / 60,30,57,30,40 TYPE W.C.,W.C.,W.C.,W.C.,T / T,W.C.,W.C.,W.C.,T

FIGURE 16

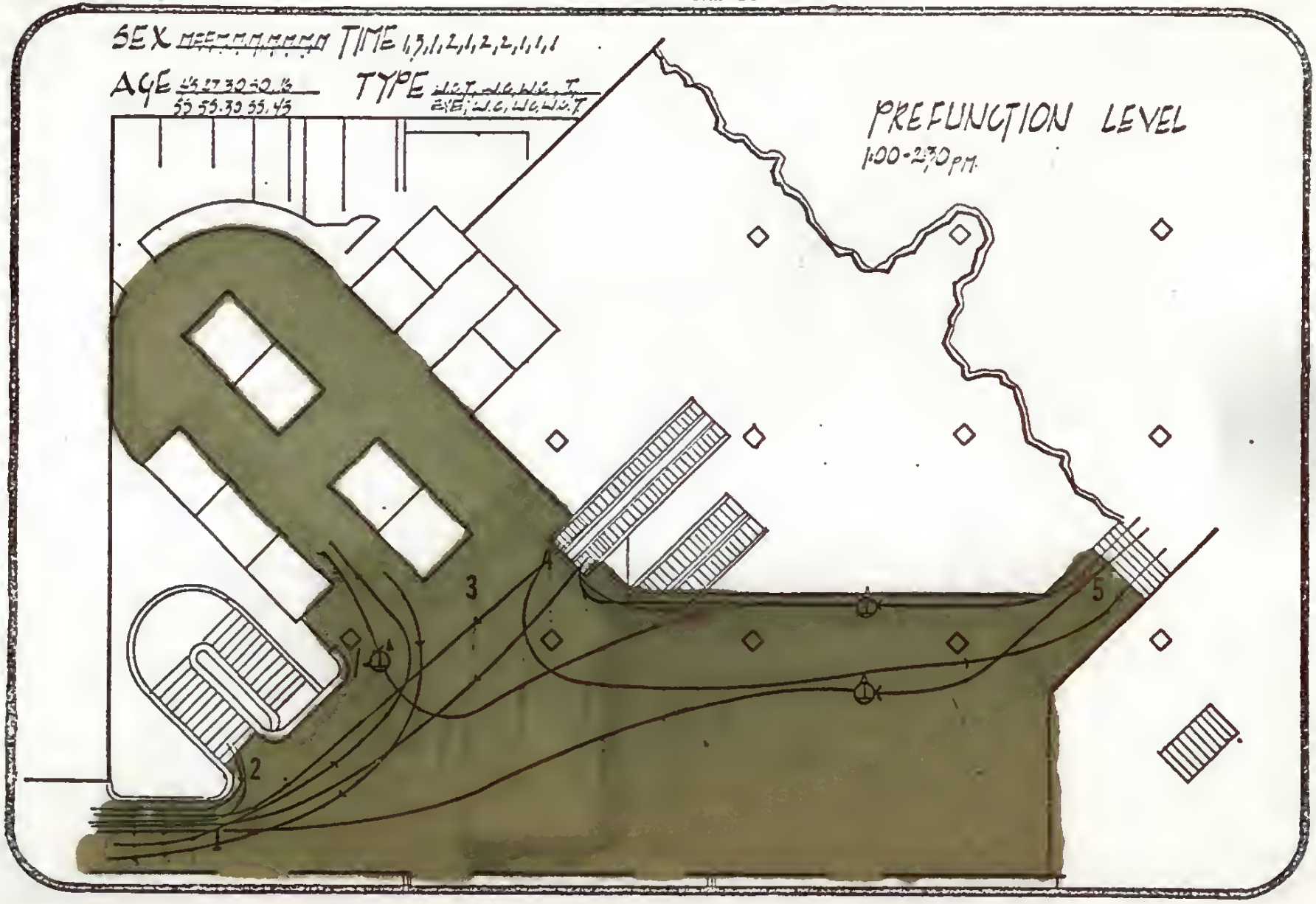

SEX M F F M M M M M M M TIME 1,3,1,2,1,2,2,1,1,1
AGE 45 27 30 60 16 55 55 30 55 45
TYPE W.T, W.C, W.C, W.S, T E.B; W.C, W.C, W.S, T
PREFUNCTION LEVEL
1:00-2:30 PM
1
2
3
4
5

FIGURE 17

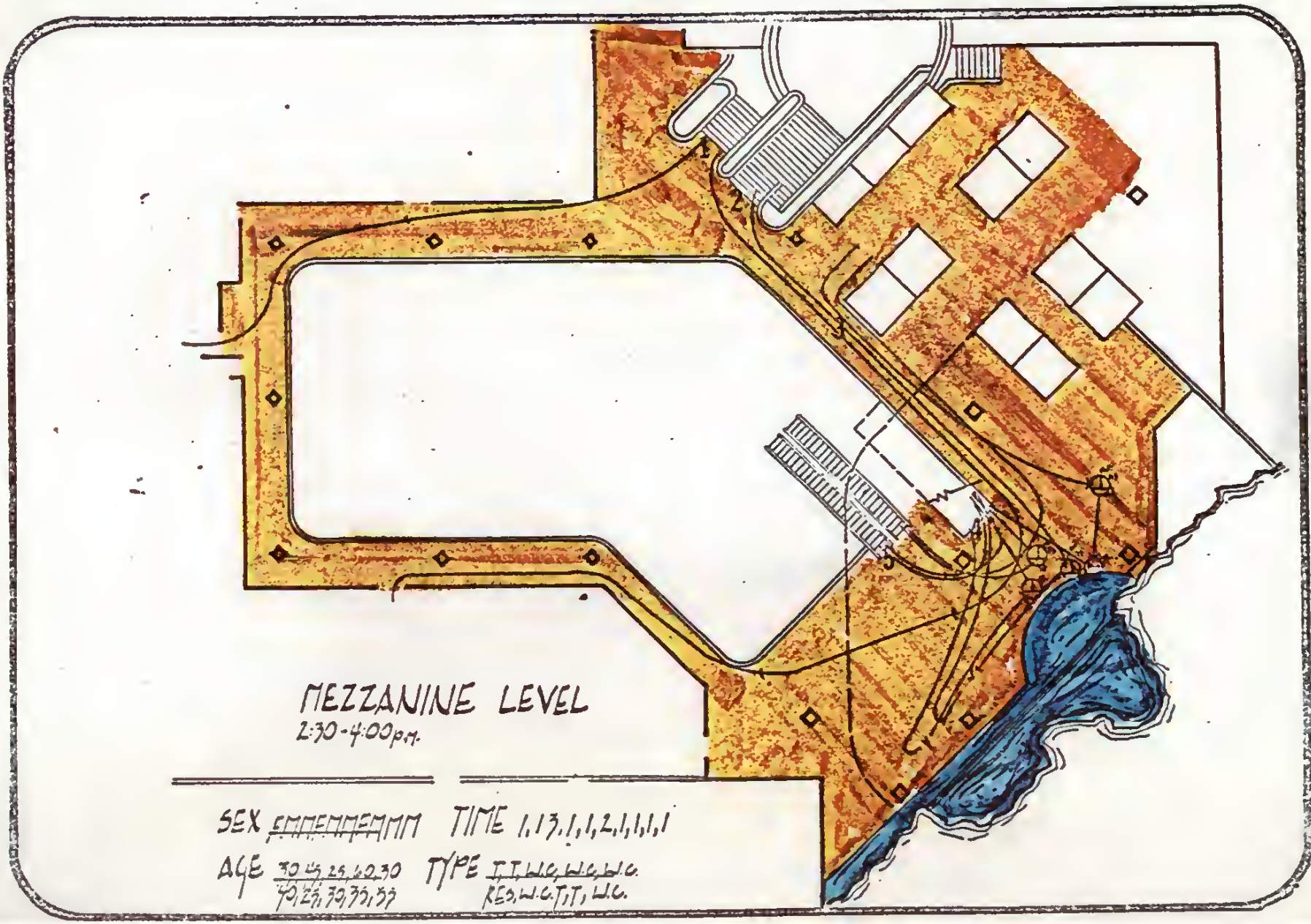
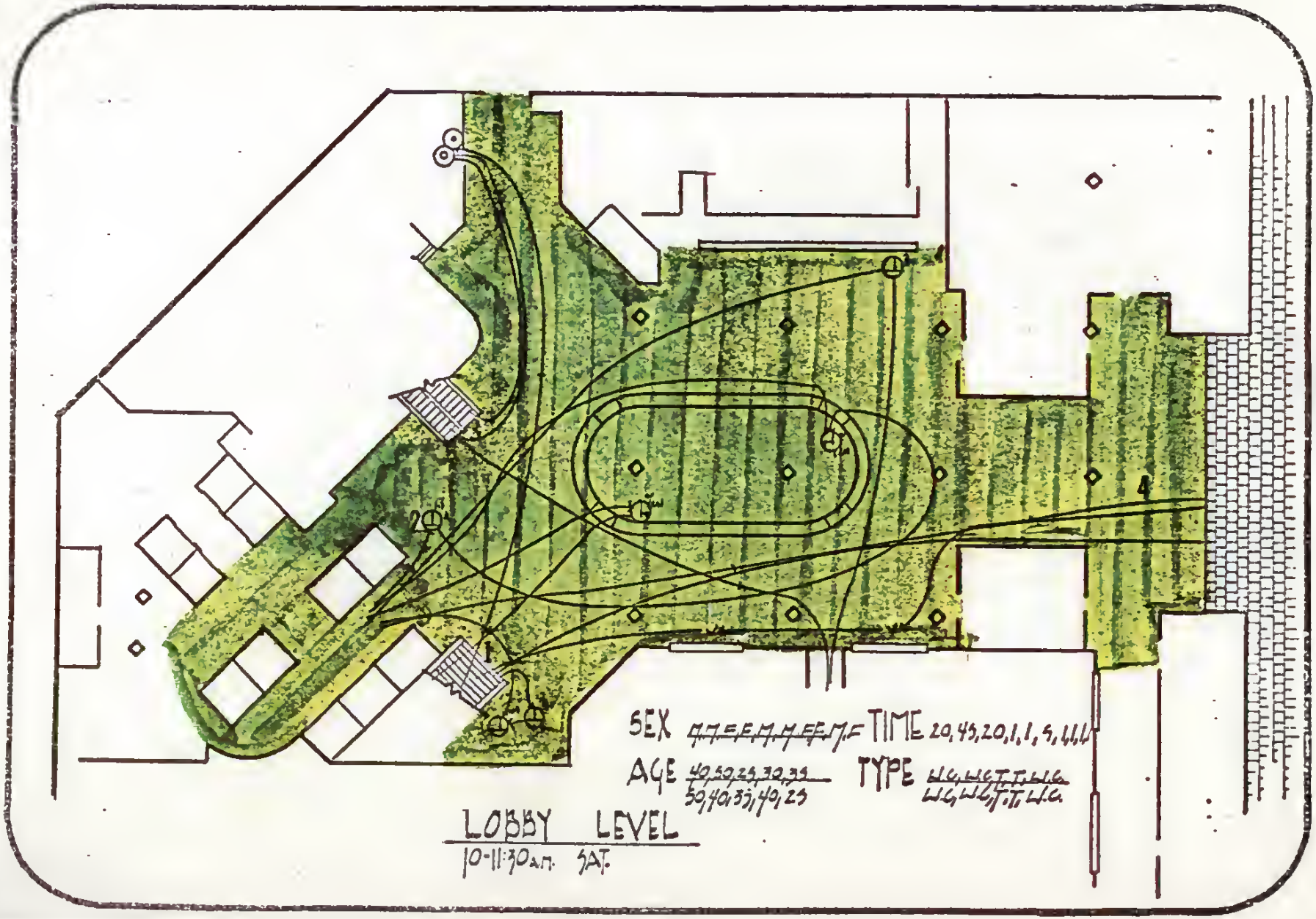

MEZZANINE LEVEL
2:30-4:00 p.m.
SEX F M F M F M F M M M TIME 1, 13, 1, 1, 2, 1, 1, 1, 1
AGE 30 45, 25, 40, 30, 70, 25, 30, 35, 55
TYPE T, T, W.C., W.C., W.C., RED, W.C., T, T, W.C.

FIGURE 18


SEX M.M.F.F.M.M.F.F.M.F TIME 20,45,20,1,1,5,4,4,
AGE 40,50,25,30,35 50,40,35,40,25 TYPE WC,WC,T,T,L,C WC,WC,T,T,L,C
LOBBY LEVEL
10-11:30 A.M. SAT.

INTERVIEWS

The survey that was conducted upon the participants of the interior environment may now be statistically analyzed by use of the modern, high-speed computer. Statistical analyses considered economically infeasible a few years ago because of the labor involved is now routinely completed in a few seconds. With the development of easy-to-use computer programs of the sort included in The Funstat Package in Fortran IV, even the most elementary statistical analysis is more conveniently completed on the computer than with paper and pencil. Each program is accompanied by instructions for its use and by a sample output. The program that was most beneficial to the author's case study was simple tabulation based on a 0-9 scale.

PROGRAM A1. SIMPLE TABULATION ON 0-9 SCALE

Quite often in the analysis of data recorded on IBM cards, especially data from questionnaires and similar instruments, a simple tabulation of the responses to the various items is desired. If the responses are limited to the positive integers, zero through nine, and if the number of items (questions or variables) does not exceed eighty, PROGRAM A1 will provide a complete tabulation of the number of subjects choosing each response to each item. It also provides the percentage of the total to each item. It also provides the percentage of the total number of respondants choosing each response to each item. Non-response (blanks) are recorded as zero responses. The program also counts and reports the number of subjects.[37]

---

[37] John Koscoe, The Funstat Package in Fortran IV, New York, Holt, Rinehart & Winston, 1973, p. 16.

The interviews as discussed in this chapter as well as the next, are illustrated on the next few pages (Table 7, 8, 9, 10, 11, and 12) as Question/Response Analysis.

TABLE 7

QUESTION/RESPONSE ANALYSIS
(Total Scheme)

1a. Why did you select this hotel over other competing hotels?

Waterfall.....54%
Garden.....28%
Walkway..... 5%
Rock used inside.....20%
Natural Light Filtering Inside.. 3%

1b. Is this setting unique among other hotels you have visited?

Agree.....100%
Disagree..... 0%
Do not know..... 0%

1c. What component(s) in this setting make the interior environment unique?

Centrally Located..... 6%
Selected for him..... 6%
Convenience of Shops..... 14%
Landscape..... 71%
Most Comfortable..... 3%

2a. This setting can be interpreted emotionally in several different ways, using the words below, rate how you perceive the interior environment.

Happy	49	38	12	0	2	Unhappy
Exciting	32	23	22	8	15	Calming
Stimulating	34	29	17	10	10	Relaxing
Satisfying	50	39	9	1	1	Unsatisfying
Relaxing	54	33	13	0	0	Boring

2b. To what extent do you utilize the interior setting while in the hotel?

0 = Not at all..... 7%
1 = Seldom.....24%
2 = Sometimes.....36%
3 = Frequently.....33%

2c. The components of this setting produce mixed reactions among different individuals, using the wording below, rate how you perceive the interior environment.

Usual	6	1	1	35	48	Surprising
Simple	9%	4%	10%	36%	40%	Complex
Common	0	1	9	33	57	Rare
Varied	47	35	14	2	1	Redundant

2d. What are some of the components in this interior environment that make it complex?

Waterfall.....46%
Natural Rock Ledge.....17%
Large Windows Letting
Light in..... 7%
Walkway through Garden.....15%
Large trees & Shrubs.....15%

3a. Do you feel that the interior environment provides adequate waiting area?

Yes.....13%
No.....87%

3b. If you were waiting for activities to begin, where would you wait?

Lobby.....34%
Mezzanine.....17%
Prefunction.....14%
Interior Garden..... 8%
Top..... 8%
Lobby/Bar.....19%

4. What thing(s) do you like most about the hotel?

Centrally located..... 7%
Shop Convenience.....30%
Landscape.....47%
Elevator..... 7%
Walkway..... 4%
Recreational Facilities..... 5%

5. What thing(s) do you dislike most about the hotel?

Not enough seating on prefunction level.... 6%
Not enough seating on mezzanine level..... 3%
No indoor pool..... 2%
No clocks.....10%
It was adequate.....79%

6. Are you currently registered in the hotel?

Yes.....27%
No.....73%

7. How many times have you been to the Crown Center Hotel?

15 or more.....17%
14 - 10..... 1%
9 - 5..... 5%
4 - 2.....29%
1.....48%

TABLE 8

QUESTION/RESPONSE ANALYSIS
(TOP LEVEL)

Note: Total schemes should precede each interview schedule of the independent levels.

9a. In your estimate, what is the primary purpose of this level?

Observation.....53%
Recreation.....27%
Lounge to Relax.....20%

For what reason did you come here today?

a. pool.....23%
b. health club..... 3%
c. sports deck..... 0
d. observing garden and people below...31%
e. business..... 0
f. relieving tension..... 0
g. other.....25%

10a. In your opinion, what is the primary purpose of the hanging corridor?

a. access to pool.....47%
b. access to health club.....20%
c. access to sports deck..... 0
d. observing garden and people below...33%
e. business..... 0
f. relieving tension..... 0
g. other..... 0

For what reason(s) are you using the hanging corridor today?

Access.....67%
Observation.....33%

TABLE 9

QUESTION/RESPONSE ANALYSIS
(INTERIOR GARDEN AND WATERFALL)

Note: Total scheme should precede each interview schedule of the independent levels.

9a. What component(s) if any, adds "life" to the interior environment around us here today?

Waterfall.....53%
Sound of Waterfall.....13%
Plants.....14%

10a. To what extent do you feel the interior garden attracted you into this space?

0 = Not at all..... 0
1 = Slight..... 4%
2 = Moderately.....23%
3 = Very Much.....30%
4 = Extremely So.....43%

TABLE 10

QUESTION/RESPONSE ANALYSIS
(Prefunction Level)

Note: Total scheme should precede each interview schedule of the independent levels.

9a. In your opinion, what is the primary purpose of this level?

Observing Garden & People Below.....60%
Waiting for Meetings.....37%
Strolling..... 3%

For what reason did you come here today?

a. waiting.....10%
b. observing garden and people below...80%
c. business.....10%
d. relieving tension..... 0
e. other..... 0

9b. Should more seating be accommodated in this area?

Yes.....50%
No.....50%

10a. From this level, what is your primary means of access to the garden? Fifth level?

Garden - Stairs.....20% Elevator.....80%

Fifth Level - Stairs.....27% Elevator.....73%

11a. From this level, how would you arrive at the Crown Center shops and square?

Mezzanine.....20%
Lobby.....53%
Prefunction.....27%

12a. From this level, what is your primary means of access to the:

Hotel Rooms - Elevator 100% Stairs 0

Fifth Level - Elevator 27% Stairs 73%

Sports Deck - Elevator 33% Stairs 67%

TABLE 11

QUESTION/RESPONSE ANALYSIS
(Mezzanine Level)

Note: Total scheme should precede each interview schedule of the independent levels.

9a. At what point does the natural garden change to the formal ballroom?

Garden..... 0
Around Waterfall..... 0
At Edge of Carpeting.....67%
Behind Elevators.....33%

10a. From this level, what is your primary means of access to the:

Hotel Rooms - Elevator 100% Stairs 0

Fifth Level - Elevator 43% Stairs 57%

Sports Deck - Elevator 57% Stairs 43%

11a. What floor do you use to connect the activity blocks within the hotel with Grand Avenue?

Prefunction Level 10%

Mezzanine Level 60%

Lobby Level 30%

Other 0

TABLE 12

QUESTION/RESPONSE ANALYSIS
(Lobby Level)

Note: Total scheme should precede each interview schedule of the independent levels.

9a. Once in the lobby, to what degree do you utlize the space as a lounge to sit, relax and observe people?

0 = Not at all.....30%
1 = Slight.....23%
2 = Moderate.....13%
3 = Much.....14%
4 = Extremely so.....20%

10a. From this level, what is your primary means of access to the:

Hotel Rooms - Elevator 100% Stairs 0

Fifth Level - Elevator 80% Stairs 20%

Sports Deck - Elevator 90% Stairs 10%

11a. In your opinion, what level functions as the arrival point of the hotel?

Lobby.....100%

12a. Do you see a more logical selection for an arrival point in the hotel?

Yes..... 0
No.....100%

CHAPTER VI

ANALYSIS OF DATA

The primary objective of this chapter will be to analyze the data gathered during the case study. The techniques utilized by the author in the evaluation were selectively chosen to uncover whether or not the physical properties of the interior landscape either hindered or facilitated in the execution of behaviors in the Crown Center Hotel and uncovered whether or not the designer's objectives were functioning. Triangulation was implemented in the form of interviews and unobtrusive behavioral observations to cumulatively record how the particpants reacted to the environment. This enabled the researcher to isolate and document human interaction with the physical environment in hopes that a more viable insight towards the case study may be gained and generalizations drawn to future designs.

The continued use of P.C.E. in the future relies upon quantification; and the validity of findings is proportional to the frequency of their repetition. Since no other studies of this nature have been undertaken, it would be questionalbe as to the value of this data independently in the design of a future site.

The following issues compares the designer's "focus assumptions" with findings of the case study.

ISSUE 1 <u>The garden and waterfall were incorporated in the design to make the hotel unique among other hotels. This unique appearance entices the participants to use this hotel over other competing hotels</u>.

The prime reasoning the designer incorporated the interior garden

and waterfall within the hotel was to create a unique atmosphere over other competing hotels in the area, thereby, attracting potential visitors to stay at the Crown Center Hotel. A unique environment was successfully implemented within the hotel as the participants attested. One-hundred percent of the sample polled felt that the environment created was unique among other hotels they had visited (see Question/Response Analysis, page 93). This figure, compounded by fact that 71% of the total population surveyed were attracted to the hotel to observe the landscape, demonstrated the design's effectiveness in attracting people to the hotel by the interior garden. The unique feature that specifically attracted these participants into the hotel was the waterfall (46%), and the garden (28%).

However, what was not taken into consideration during the designer's program was the population type being drawn into the hotel. Initially, the owners visualized that some tourists would possibly be attracted into the space, but also felt the newness of the interior garden and waterfall would dissipate in approximately one year. Four years after the opening of the Crown Center Hotel, a majority of visitors (74%) still being attracted into the facility are non-hotel guests (see Question/Response Analysis). These figures, when broken down more specifically as to guests vs. non-hotel guests, yield an alternate means of interpreting the data. When analyzed, the hotel guest population was attracted to the hotel for the following reasons: (a) convenience of the shops (43%), (b) hotel was selected for them (20%), (c) centrally located in respect to downtown (20%) and (d) landscape (8%). This indicated that the participants were princi-

pally concerned with functionability as opposed to aesthetics.

While it is an ideal situation to locate an enormous range of services under one roof, the magnificence of the landscape in conjunction with the shopping center attracted tourists and shoppers which ultimately interfered with the function of the hotel. A more logical program that could have been selected at the outset would be to plan a more efficient means of separation between the shops and hotel, thereby discouraging traffic from the two areas or perhaps a capitalization of the garden feature oriented to the shops rather than the hotel.

Hopefully, designers may use this accumulation of data to aid in the implementation of future interior landscapes, developing designs that are sensitive to the users and clients needs. For instance, from this initial evaluation, one may hypothesize that landscapes when used appropriately are a viable means of attracting people to utilize a facility (i.e., shopping centers) but must be used with caution when hotels are used in conjunction with shopping centers.

ISSUE 2 The garden was conceived to add excitement to the hotel and give the participants something to do while visiting. This excitement should be read as complex to the user because of an increased sensory information rate, which may be defined as: the movement of the water, the sound of the waterfall, abundance of colors, uniqueness of the interior setting and excessive amount of green plants.

The designer's original intentions of creating an atmosphere in and

around the interior landscape that would give the occupants something exciting to experience while visiting the hotel was adequately expressed in the survey conducted. The survey reflected the users thoughts by means of a bi-polar semantic differential as described on page 57. These bi-polar verbs allowed the researcher to interpret the data by comparing the percentages recorded. The data indicated that excitement was being evoked by a majority of the total population experiencing the interior landscape (32%). This excitement slowly rescinded to relaxation in the following percentages, 23%, 22%, 9%, and 15% (see Question/Response Analysis).

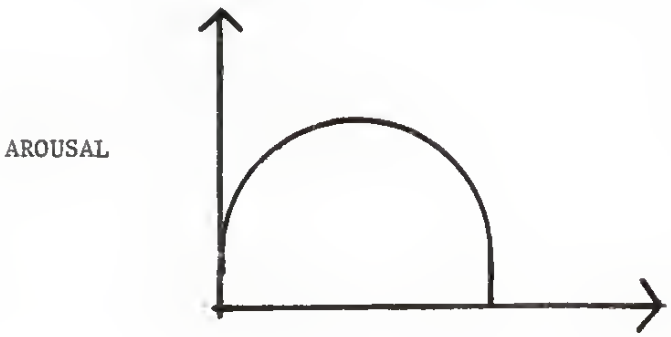
A bi-polar semantic differential scale was employed to determine if the components of the interior landscape (eg., waterfall, green plants, etc.) was being interpreted by the users as being complex and consequently, compatible with the user's criteria. The data effectively demonstrated that the largest percentage polled were visualizing the environment as being complex (41%), slowly rescinding to simple on the scale by the percentages of 36%, 10%, 4% and lastly, 9% (see Question/Response Analysis).

This complexity rises as the number of elements within the landscape increases. This is more expressively stated by Albert Mehrabian in An Approach to Environmental Psychology, in which he demonstrates how there is a direct positive correlation between the number of elements in an environment and arousal in the user. Arousal was interpreted by the author during the survey as the amount of time the participants used the interior landscape. The total population surveyed occasionally (36%) participated with the interior environment. Their order was as follows:

frequently (33%), sometimes (36%), seldom (24%), and not at all (7%). There is an optimum threshold by which the number of elements within a landscape can have drawing power. In Fig. 19, one can see that a landscape has low arousal rate if the number of elements is low or too high.

FIGURE 19

NUMBER OF OBJECTS/AROUSAL RATIO



Since the elements of the interior was being read as complex by 40% of the total population and was still being used frequently by 36% of the participsnts, it could be safely assumed that a fairly optimum relationship existed according to Mehrabian's inverted U.

There were several elements within the landscape that created complexity. Forty-six percent of the participants polled responded that the waterfall and its sound were the most attractive factors in achieving complexity in the interior environment. Other items include: large trees and shrubs (18%), natural rock ledge (17%), walkway through garden (15%) and lastly, large windows letting in natural light (4%).

ISSUE 3 Some areas in the hotel were primarily designed to allow the user a means of waiting for functions to begin. During the user's wait, one can look out and observe the garden, waterfall and participants below.

Of the sample polled, 87% of the participants felt there was adequate waiting area in the hotel for passing time or waiting for functions to begin. However, most of the participants polled seemed to predominate in other than the garden area. These are: lobby (40%), lobby/bar (19%), mezzanine (17%), prefunction level (14%), garden (8%) and top level (7%). Possibly, the non-use of the garden area could be attributed to the fact that it was more comfortable both physically and mentally, to wait elsewhere as was attested to by the users polled. In a majority of the other levels, seating arrangements were not adequately provided for the participants to sit, wait or observe the landscape. This lack of furniture on some of the levels made them appear stark and barren during normal use hours. This could possibly explain the higher frequency of use in the lobby.

ISSUE 4 The top level or fifth floor of the interior garden should function as a lounge, primarily used by the pool and health club for sitting, relieving tension and observing the garden and participants of the interior below.

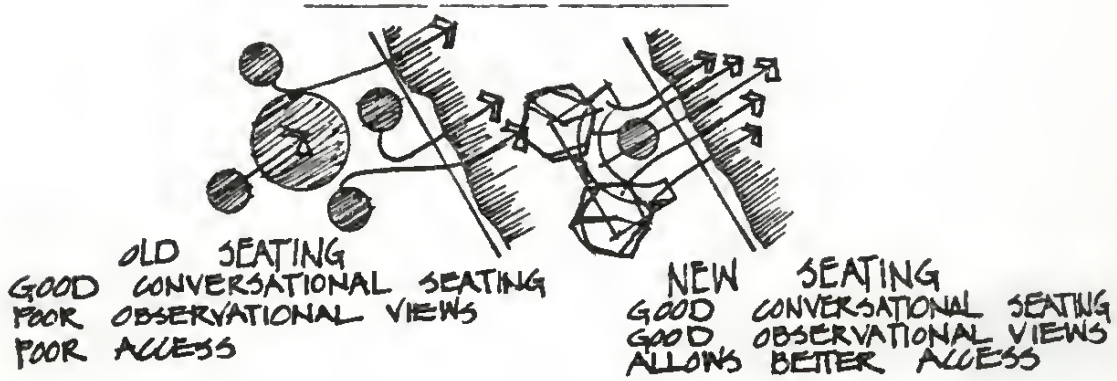
As was present throughout the hotel, the predominate population (67%) on this level were hotel guests (see Question/Response Analysis).

Consequently, the designer's criteria were jeopardized by invasion in the top level by particpants other than the pool members, health club members, and hotel guests. The primary activity in which the users participated was that of observing the garden and people below (33%), followed closely behind by the observance of individuals in the pool (27%). Only 20% of the users were lounging on the top level; the majority preferred the lobby to watch the pedestrian movement and to be served drinks.

The above figures warranted a continuation of the casual lounge, and displayed a success on the part of the designer in creating a space for sitting and viewing. From the observational phase, it was systematically recorded that the participants viewing the garden were having to get as close as possible to the edge of the garden to view downward. The seating arrangement was insensitive to this phenomenon as indicated by the placement of round tables causing the participants to strain by having to turn around or force the users to view through others. As a result, the participant either has to stand at the edge of the garden or move an existing chair. An alternative plan would be to place u-shaped boothes facing the interior landscape and pool with proper percentages on each side so that the participants are not forced to turn from their chair to view the land-

FIGURE 20

PROPOSED SEATING ARRANGEMENT



scape or were not positioned so that other members at their table were blocking the view.

ISSUE 5 The top level or fifth floor of the interior garden should serve as a physical means of access between the sports deck and the sports club by means of the hanging corridors located on the east side of the site. The primary factor of these hanging corridors should be for physical access with observation of garden and participants below spontaneously occurring.

Initially, the designer's "focus assumptions" pertaining to this criteria were satisfied. The participants that were surveyed envisioned the corridor to serve as a physical access (47% access to pool and 20% access to health club or 67% total access) (see Question/Response Analysis). The fact that thirty-three percent of the population polled were found to be using the corridor for a means of observation of garden and people below, further validated the criteria.

However, the design is not reflective of the entire population's needs. The top level is designed to be accessible by means of two primary modes of access: (1) the elevator, and (2) the stairs through the garden. At first glance, one may assume that these means of access would service the entire population. However, upon closer diagnosis of the site, one finds the top level is unsympathetic to the needs of the elderly and others with ambulatory problems. Because of the physical climb of five stories that must be undertaken when using the stairs, this population segment is

forced to use the elevator for their means of access. While the elevator provides excellent access at the fifth level, one finds massive steps leading downward to the hanging corridor as a means of access to the fifth level. A number of times during the observation period, elderly individuals were observed attempting to negotiate the stairs in a painfully slow fashion. Others with ambulatory problems are almost virtually eliminated from the fifth level.

A ramp in this situation could have easily solved the problem that existed between the physical environment and the elderly or handicapped.

INTERIOR GARDEN

ISSUE 6 The interior garden and waterfall should function as an integral part with the garden becoming the background and the waterfall giving the participants in the environment a feeling of movement in the space.

During the evaluation, users were observed watching the waterfall run through the garden to the mezzanine level for extended periods of time. However, these participants were not only physically in the garden, but also on other levels surrounding the landscape (Fig. 12f, p. 42). These observations, compounded by the survey data, indicated that the waterfall cascading from the top of the garden to the mezzanine level added "life" or movement within the interior environment. The plants also were noticed by the participants as a viable component within the garden (33%). However, the plants were actually secondary or background when compared with the amount of time spent watching and listening to the waterfall (67%).

These quantified occurrences attested to the design's effectiveness in satisfying this particular criteria for the garden.

The garden level could function more adequately for older individuala or users with ambulatory problems if a simple design improvement could have been implemented as one enters the garden and is confronted with four steps. Although it poses very little problem for the average participant, it represents a restrictive barrier for the elderly. Problems such as this could have been easily remedied by employing a ramp at the entrance to the site aa opposed to the steps.

ISSUE 7 The interior garden and waterfall should function as integral parts by attracting one into the interior space with its scenic beauty and rushing water.

The designer's apparent success in satisfying his criteria was demonstrated by the amount of uaage the garden receives. The general population enjoyed visiting the garden quite frequently. Forty-three percent of the participants stated that the interior garden attracted them into the space. This compares to 30% who indicated a moderate attraction and 23% with a slight attraction.

Erosion which is the wearing of material to yield the measure, was observed in the garden at steps that had been worn away from considerable use. The participants were also observed and syatematically recorded as paying attention to the waterfall (67%) and garden (33%), consequently, denoting that the users were being attracted by the sound and movement of the rushing water and, by the plants. Perhaps, these observations may

demonstrate to designers of interior landscapes, the significant importance of the use of water in an interior to achieve a focal point.

Several times during the year, the garden is closed to the general public for maintenance and repair, consequently, denying many of the users an opportunity to experience the landscape firsthand. During one of the author's visits, maintenance crews were attempting to repair the seepage of water coming from the waterfall and going through the rocks, presenting a potentially dangerous rock slide if left unattended. This problem would have been more easily solved during construction of the waterfall.

PREFUNCTION LEVEL

ISSUE 8 The intermediate or prefunction level should allow the ballroom to function more adequately enabling the participants to utilize the space in front of the ballroom to look out and observe the garden, waterfall and participants. This type of activity gives the participants something to do while waiting for the function to begin.

During times when conventions were not occurring, the prefunction level functioned admirably in relation to the designer's assumed criteria. The users were observed and polled using the space as a means of observation of the garden, waterfall and participants below (80% of total population). However, the space could possibly function more adequately if the seating provided would be more reflective of the users needs. Much of

the seating accommodated visual observation of parts of the upper landscape, yet greatly hindered observation below, while other seating was totally insensitive to observation of any type because of the orientation. Also, the seating provided was linear in nature, thus not well suited for conversations.

During conversations, it was observed frequently, that the conventioneers were possibly standing simply to gain a face-to-face contact rather than sit on the unsympathetically placed chairs. Because a majority of the observation of the garden occurred at the points closest to the edge of the interior garden, additional seating should be placed as close to the edge as possible, lending itself to the propagation of good conversations. Tables should be provided in some instances since it was observed that many of the conventioneers had material to discuss that needed to be laid out. They dealt with the situation by altering the existing furniture to make the linear chairs or tables more usable.

During the course of the convention, portable tables were brought out onto the prefunction level to provide snacks during an intermission from the ballroom. These tables impeded the observation of the garden and participants below. Also, more activity could be observed from this level if the guard rails on the edge of this level were made of plexiglass which would enable the participants to sit back and watch various activities.

ISSUE 9 The intermediate or prefunction level should serve as a physical access by means of the stairs, to the garden upper level or fifth level.

This point of ingress and egress was used quite extensively by the total population of the hotel during the course of the day. 100% of the population polled use the prefunction level as a means of access to the garden. When the garden was open, 80% of the total population preferred to use the stairs to arrive at the top level. However, too often the garden stairs were not open becauae of routine maintenance, consequently detracting from the experience the garden would possibly yield. Again, no consideration was yielded to the elderly or handicapped in relation to access to the garden, but could have been easily accommodated (as discussed previously in the interior garden, ISSUE 6).

ISSUE 10 The intermediate or prefunction level should function as a physical means of access to the Crown Center retail shops and square.

The stated objectives of the designer were usually consistent with the manner of usage of the participants pertaining to thia criteria. A slight discrepance exists within the criteria in that a majority of the users are coming from the lower access point between the lobby and mezzanine level (lobby 53% and mezzanine 20%). This constitutes a vast majority of the users (73%) as compared to the 27% who use the upper level or prefunction level to gain access to the hotel from the Crown Center shops and square. The reason for this could be that the lower level (lobby and mezzanine) is the ground floor which handles traffic from Grand Avenue without requiring an individual to climb steps.

ISSUE 11 The intermediate or prefunction level should

function as a physical access from the elevator to the hotel rooms and fifth floor.

The elevators are used primarily by the residents to gain access to their hotel room (100%) and the sports deck (67%). Their extensive use demonstrates their success in satisfying the assumed objectives of the designers. One reason the elevators are used this frequently can be explained by the fact that the residents would have an arduous walk up to hotel rooms since the hotel is 18 stories high. Since the back wall is constructed of plexiglass, the elevators provide a dynamic vista of Kansas City while simultaneously remaining quite convenient and accessible. From the lobby to the fifth level, the majority of users gain access via the stairs which wind through the garden (73%). This fact could be a testament to the designer's effectiveness in creating an interior landscape that "draws" people into and through the interior garden.

MEZZANINE LEVEL

ISSUE 12 The mezzanine level should function as a transition zone between the natural rock garden and the formal ballroom. This should be accomplished by allowing the garden to continue at the mezzanine level by using a stone fieldstone paver which changed to carpet coming down the stairs.

This criteria was best elicited by means of the survey used independently, especially since a transition would be extremely difficult if

not impossible to observe. From the data cumulatively recorded, the author was able to compare the different places transition might be taking place and it was found that the change from fieldstone paver to carpet was satisfying the designer's assumed objectives remarkably. Sixty-seven percent of the total population picked the ones where the fieldstone paver meets with carpet as the transition zone.

ISSUE 13 The mezzanine level should function as a physical access by means of the elevator to the hotel rooms and fifth floor.

The primary mode of access to the mezzanine level is the elevators. The elevators are used primarily by the participants to gain access to their rooms (100% use the elevators) and sports deck (57% use the elevators). This may be attributed to the sheer distance to the above levels (18 stories) along with the ease to obtain one of seven elevators and the vista afforded the participants of Kansas City via the clear plexiglass panel in each elevator.

The stairs are predominantly used by the participants to gain access to the fifth level. Again, this phenomena could be a testament to the designer's effectiveness in creating an interior landscape that "draws" people into the interior garden. The particpants on the mezzanine level that wish to use the elevator have to go up or down one floor because the elevator call switches were removed due to the high use by non-residents. The mezzanine was selected primarily because of the intensive use by the conventioneers.

During the convention, it was observed quite frequently that when

the convention sessions had a recess, the conventioneers would utilize the tables and chairs on this level as a means to spread their material out and discuss it. This observation displayed a need for these participants to have tables at both this level and also the prefunction level (ISSUE 8).

ISSUE 14 The mezzanine level should function as a means of connection for the activity blocks within the hotel and Grand Avenue.

Although 30% of the individuals use the lobby level as an access point, a greater majority were using the mezzanine level to aid in connecting Grand Avenue with the activity blocks (60%). Both of these levels are accessible through the same corridor, so basically 90% of the participants use the lower level (mezzanine and lobby) as opposed to upper prefunction level (10%). These figures display the significant drawing power the interior garden and waterfall have on attracting users into the space, primarily in front of the waterfall as a means of arriving at the Grand Avenue or the activity blocks. Interpretation of the data ascertains the designer's effectiveness in satisfying the design criteria set forth.

LOBBY

ISSUE 15 The lobby level should function as a lounge to sit, relieve tension and observe spontaneous behavior of other participants.

The sunken lounge was not used by the majority of the participants. Even when analyzed more specifically, one finds that of the participants

using the lobby level, only 15% of the population was using the space frequently. Thirty-eight percent of the participants did not use the sunken lounge at all. However, it was observed that the lounge was receiving optimum use for the area provided. A positive aspect was the portable seating provided, allowing the users to move the chairs to accommodate conversations and group gatherings.

From a cursory review, the sunken lounge/bar appeared to be functioning as it was intended. However, some of the participants interviewed felt very relunctant to enter the lounge/bar for the mere fact they did not drink. Some provisions had been made for this population, yet these seating accommodations were out of the main course of traffic reducing the ability to watch people considerably. Accommodations could very easily be made to service this small population by the simple placement of the furniture where needed.

The lobby/bar appeared to be very successful due to its central location. This success was interpreted by the high use received by the facility all during the day.

The designer should have been more sensitive to the fact that the motor reflexes of the users could possibly be hindered upon exiting. Utilization of ramps in lieu of steps may have been in order. It waa observed a number of times that the particpants were not negotiating the steps in a competent manner. The ramps would also accommodate elderly participants and users with ambulatory problems who are confronted with these problems daily.

Participant conflicts also arose when some of the participants observed and polled (5%) had difficulty locating the elevator because of

inadequate signage. During one observation period, an individual in a wheelchair was observed trying to cope with the stairs because she could not find the elevator. Consequently, her friends eventually had to physically carry her up the massive steps.

ISSUE 16 The lobby level should function as a physical access by means of the elevator to the hotel rooms, fifth floor and sports deck.

The elevators are used extensively from the lobby level to arrive at the hotel rooms (100%) sports deck (90%) and the fifth level (80%). Their extensive use demonstrates their successfulness in satisfying the assumed objectives of the designer.

ISSUE 17 The lobby level should function as the point where the guests arrive in the hotel.

There were no apparent conflicts incurred by the placement of the lobby in its present location. Every resident polled felt its proximity was ideal in relation to the other parts of the hotel and none of the users would relocate the present lobby if the project were to be redone. The lobby level was found to be very compatible with the assumed criteria of the designer.

In general, several of the users verbally displayed dissatisfaction about the hotel during the course of the interview. Although these individuals were a minority on the site, their comments were soberly taken. A major oversight was the fact that no clocks had been included at the various levels in the hotel. In several cases, businessmen had asked

the author for the time of day and expressed their frustration when not being able to find a clock (10%).

Although the outdoor pool is heated, some participants were very reluctant to utilize the facility and would prefer an indoor pool instead.

During the pre-test of the interview, some elderly individuals were recorded using the hotel as a place to relax during the day, giving them something to do. To determine if this elderly population were making a significant appearance in the space, the author systematically recorded each participant during the observation phase and found that although this elderly population is present on the site, they were not a significant portion of the user population.

CHAPTER VII

REVIEW OF TECHNIQUES

SECTION A

GATHERING THE DESIGNER'S CRITERIA OR "FOCUS ASSUMPTIONS"

SECTION B

INTERVIEWS WITH USERS

SECTION C

BEHAVIORAL OBSERVATIONS

SECTION D

DATA ANALYSIS

The analysis of the data provided the author with a means of evaluating the techniques employed. The use of the techniques in the design evaluation was proven to be quite effective by the comparable data accumulated. The techniques proved to be sensitive to the needs of the users and allowed the continuing feedback of user response which might be entered into the future design process. Hopefully, even though the unpredictable will always be present, the unknown element in design can be lessened by employing P.C.E..

From a cursory review of the techniques, one may feel a comparable amount of data may be effectively elicited from a less arduous non-systematic review of the site in which users are not taken into consideration. However, to evaluate an environment non-systematically would place the researcher into the same position as the designer who develops a site on assumptions. These assumptions, no matter how viable they seem at the moment, are only speculation on the part of the researcher. If the researcher, however, systematically observes and interviews the participants using the environment, the data assembled is based on factual observation rather than speculation, allowing the designer to draw from this cumulative bank of knowledge, to design environments that are more user oriented.

Since a post construction evaluation of an interior landscape and its related spaces has never before been undertaken, the designer's criteria were analyzed in regard to specific considerations. However, as more post construction evaluations are undertaken to evaluate the effectiveness of designed environments in supporting human needs, norms

should become more apparent, thereby allowing a researcher to evaluate one interior landscspe over another in respect to superiority.

Figuratively speaking, the author's approsch to the problem wss to use viable methods already developed by social scientists and refine them to fit the criteria set forth by the designer during the program.

The evaluation will continue by reviewing the author's techniques from beginning to end, in respective order. This will demonstrate to the reader how the author's techniques of evaluation of Crown Center Hotel may be improved upon.

GATHERING THE DESIGNER'S CRITERIA OR "FOCUS ASSUMPTIONS"

In retrospect, the author should have been more tedious in abstracting clues from the plan (eg., stairs that were difficult to negotiate for the elderly) and seeking all principals that might be important to the evsluation of the design criteria for the hotel and interior lsndscape (eg., Don Hall, President of Crown Center Redevelopment Corporation). This would have been very beneficial in the elicitation of the "focus sssumptions" from the designer since very often the program is never recorded as such (as was the author's situation). Generally, the designer cannot recall what the program was or is not willing to spend time to extract the program from drawings, schematics, correspondence, project notes, etc.. An ideal situation would be to complement the two techniques discussed above with a slide review of the site to be evsluated with the designer present to refamiliarize him with the project and possibly remind him of specific criteria pertaining to each space. This technique

was not feasible in the author's situation because of the physical distance between New York and Kansas City. Also, in retrospect, the author could have shortened the questions given to the designer.

INTERVIEWS WITH USERS

In retrospect, the evaluation could have been more effectively accomplished if the order of the techniques implemented upon the site (surveys and observation) could have been reversed. The reverse approach should be undertaken during the next evaluation to gain a better insight towards how the participants are using the site. The reactive nature of the interview disallowed some of the participants to verbalize their comments concerning the hotel (see Preface to Survey Techniques, Chapter IV). By allowing the observation period to precede the interview schedule, the researcher may visually observe how the environment is functioning and relate the interview questions to specific areas of interest more acutely, thereby allowing the participants to verbalize additional comments concerning the environment in which they were confronted. The actual survey should be implemented after the observation phase has been accomplished and analyzed.

Caution should be strictly adhered to when developing an interview schedule for each individual criteria. Each criteria should employ at least two different methods of analyzing the designer's "focus assumptions" (triangulation), but sometimes only one method could be utilized (discussed in Preface to Survey Techniques). A competent person familiar with formulating interviews should be employed.

The questions should be few and simple to comprehend for reasons of courtesy as well as encouraging second party cooperation. The interview in this project lasted approximately 3-5 minutes, depending on the individual interviewed. Very few participants denied the author their

assistance.

After the questions had been developed, the author ran a pre-test of the questions while on the actual site. The pre-test was undertaken to get a feel for asking questions to the participants and to evaluate whether or not the users were interpreting the questions properly.

The pre-test as well as the actual survey were conducted on similar days so the data accumulated would be comparable in nature. The station selection chart (p. 82) was employed religiously to insure randomness in the sample and proved to work quite adequately.

To obtain a good rapport between the interviewer and interviewee, the author wore a coat and tie, which consequently made these users feel less apprehensive concerning the interviews.

During the interviewing session, the author approached employees of the hotel to get their reaction about how the site was functioning. The employee population proved to be a wealth of knowledge for the author since they were on the site daily. These employees should be systematically taken into account in the next evaluation that ensues using the same interview schedule with more value being put on employee response.

The interview proved to be a very effective tool in eliciting the designer's objectives from the users and determining their likes and dislikes. Sometimes this has been the only means in which the criteria could be effectively evaluated by the author.

BEHAVIORAL OBSERVATIONS

The author's original intentions were to evaluate the site, independent of any other researchers, to discover how small offices could conduct evaluations on their own. With fewer researchers on the site, the obtrusiveness would be reduced. However, in reviewing the technique, the author feels that during the observational period, one should employ five researchers during evaluation (one per level). The alteration of the technique is suggested primarily because the data elicited would be more comparable in nature. Secondly, it reduces the amount of time one has to spend upon the site. Thirdly, since the site has five independent levels, anonymity for the five researchers who evaluate the hotel would be favorable.

The observations were recorded over a representative time span of five days (weekday and a weekend), as designated by the client. However, since the author evaluated the hotel independently, the weekend observation time (Saturday) had to be split up in five periods. This was done so the observational phase of the evaluation could be conducted completely within a reasonable time limit of one week. A more logical approach to the problem would be to use the five researchers to uncover the data and gain a more viable insight in less time.

The hotel site lent itself to observing the individuals participating in the environment very effectively. The researcher was allowed to remain seated on the site and trace the behavior of the users without detection. Movements were systematically recorded without detection as the researcher was able to fit into the crowd by dressing in the same

mode of dress as the particpants (coat and tie). However, some sites may provide difficulty during the observational mode of the evaluation, since the movements of the participants will have to be independently traced by following them around the site from entrances to exits. In this instance, the particpant being traced must not know he is being observed for "reactivity" will invalidate the procedure and consequently negate the evaluation.

Prior to the observational period, the researcher should make a cursory review of the site to obtain general user behavior as well as user classifications. This is beneficial in aiding the researcher to record the participants in the brief amount of time available for notations. Also, if more than one researcher conducts the survey, it would add consistency to the technique. A problem that became apparent with the use of these techniques was that the various user types were relatively indistinguishable in the environment. For instance, the difference between a shopper and a resident could not be accurately determined by simple observation. The behavior checklist should always be open for additions or deletions because the researcher is very likely to observe behaviors not taken into consideration in formulating the checklist.

The next phase of the evaluation that the researcher employed was Researcher Participation. This consisted of first actually participating in the environment, noting conflicts and sampling conversations of participants about each particular level. The first part of this technique allowed first-hand knowledge of each level. The technique of conversation sampling did not benefit the effectiveness of the evaluation. The

participants were very reluctant to openly talk when an alien broke into their social distance. When this did occur, the conversation was generally concerning business. The second and third parts of this technique were erosion and accretion. Erosion was not that present on the site due to its recent construction of four years prior to the survey, excepting the wooden garden steps which readily displayed erosion at heavy use points. Accretion was used to determine where the population was coming from, but the waste baskets were few and no consistency could be developed, so this method was deemed inappropriate for this particular evaluation.

Photography, using a 35mm camera was used in recording places and behaviors identified by the researcher. These photographs provided further understanding of the mapped occurrences on the site and gave visual support to the documentation of this evaluation.

The observation phase of the evaluation should procede as follows:

1. A cursory review of the site to abstract behaviors and possible user types.
2. Researcher Participation with the researcher actually participating with each level and possibly abstracting clues from erosion and accretion.
3. Observation of the users should be systematically recorded. During those observational techniques, a written log should be kept to identify occurrences on the site compounded with photography. All of these techniques should occur concurrently during the observational period.

DATA ANALYSIS

The analysis of the data proceeded by evaluating the effectiveness of the design criteria in relation to participant use. Each of the criteria was individually analyzed to determine which of the evaluatory techniques or combination of techniques should be employed to properly extract the effectiveness of the design criteria upon the hotel. The author was also constantly on the alert to find user conflicts between the environment and the participant that the designer did not take into account in this initial program. These observations were systematically recorded and photographed so that once these confrontations were noted, the researcher could follow with user surveys.

The computer was a beneficial tool in the author's evaluation during the analysis of data. Using a simple tabulation technique involving the Fortran IV program, user totals and percentages were tabulated for each questions.

Since this evaluation is the first of the author's knowledge, to be implemented upon an interior landscape, there is no comparative data on which to base the results of the evaluations. Therefore, the author related to each individual criteria and places of concern within the project to percentages and cumulative behavioral observations. Hopefully as similar sites are evaluated, norms will be established for these interior landscapes to determine the superiority of one site over another.

The final analysis of data should include any linkages between the data and "focus assumptions" that were established during the program of the hotel or any other data that was found not supporting the behavioral

needs of the people.

Most of the concentration of the data analysis should be placed upon the designer's "focus assumptions", if the program is to be properly elicited from the designer at the outset of the evaluation. This should be done because most of the primary objectives were initiated at this stage and would be helpful in preparing design programs for similar projects in the future.

The designer's focus assumptions concerning the site were satisfactorily elicited and in a majority of the situations, were working quite well with respect to the site. However, since this evaluation is one of the first to be implemented upon an interior landscape, there is no comparative data upon which to base the results of the evaluations. Hopefully as similar sites are evaluated, norms can be established for interior landscapes to determine the superiority of one site over another.

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APPENDIX

APPENDIX

INTERVIEW SCHEDULE

Total Scheme

1a. Why did you select this hotel over other competing hotels?

1b. Is this setting unique among other hotels you have visited?

Agree
Disagree
Do not know

1c. What component(s) in this setting make the interior environment unique?

2a. This setting can be interpreted emotionally in several different ways, using the words below rate how you perceive the interior environment.

Happy	___	___	___	___	___	Unhappy
Exciting	___	___	___	___	___	Calming
Stimulating	___	___	___	___	___	Relaxing
Satisfying	___	___	___	___	___	Unsatisfying
Relaxing	___	___	___	___	___	Boring

2b. To what extent do you utilize the interior setting while in the hotel?

0 = Not at all
1 = Seldom
2 = Sometimes
3 = Frequently

2c. The components of this setting produce mixed reactions among different individuals, using the words below rate how you perceive the interior environment.

Usual	___	___	___	___	___	Surprising
Simple	___	___	___	___	___	Complex
Common	___	___	___	___	___	Rare
Varied	___	___	___	___	___	Redundant

2d. What are some of the components in this interior environment that make it complex?

3a. Do you feel that the interior environment provides adequate waiting area?

3b. If you were waiting for activities to begin, where would you wait? Why?

4. What thing(s) do you like most about the hotel?

5. What thing(s) do you dislike most about the hotel?

6. Are you currently registered in the hotel? How long have you been here?

7. How many times have you been to the Crown Center Hotel?

INTERVIEW SCHEDULE

Top Level

Note: Total schemes should precede each interview schedule of the independent levels.

9a. In your estimate, what is the primary purpose of this level?

For what reason did you come here today?

a. pool
b. health club
c. sports deck
d. observing garden and people below
e. business
f. relieving tension
g. other

10a. In your opinion, what is the primary purpose of the hanging corridor?

a. access to pool
b. access to health club
c. access to sports deck
d. observing garden and people below
e. business
f. relieving tension
g. other

For what reason(s) are you using the hanging corridor today?

INTERIOR GARDEN AND WATERFALL

Note: Total scheme should precede each interview schedule of the independent levels.

9a. What component(s), if any, adds "life" to the interior environment around us here today?

10a. To what extent do you feel the interior garden attracted you into this space?

0 = Not at all
1 = Slight
2 = Moderately
3 = Very much
4 = Extremely so

INTERMEDIATE OR PRE-FUNCTION LEVEL

Note: Total scheme should precede each interview schedule of the independent levels.

9a. In your opinion, what is the primary purpose of this level?

For what reason did you come here today?

a. waiting
b. observing garden and people below
c. business
d. relieving tension
e. other

9b. Should more seating be accomodated in this area?

10a. From this level, what is your primary means of access to the garden? Fifth level?

11a. From this level, how would you arrive at the Crown Center shops and square?

12a. From this level, what is your primary means of access to the:

Hotel Rooms	Elevator____	Stairs____
Fifth Level	Elevator____	Stairs____
Sports Deck	Elevator____	Stairs____

MEZZANINE LEVEL

Note: Total scheme should precede each interview schedule of the independent levels.

9a. At what point does the natural garden change to the formal ballroom?

10a. From this level, what is your primary means of access to the:

Hotel Rooms	Elevator____	Stairs____
Fifth Level	Elevator____	Stairs____
Sports Deck	Elevator____	Stairs____

11a. What floor do you use to connect the activity blocks within the hotel, with Grand Avenue?

Pre-Function Level ____

Mezzanine Level ____

Lobby Level ____

Other ____

LOBBY LEVEL

Note: Total scheme should precede each interview schedule of the independent levels.

9a. Once in the lobby, to what degree do you utilize the space as a lounge to sit, relax and observe people?

0 = Not at all
1 = Slight
2 = Moderate
3 = Much
4 = Extremely so

10a. From this level, what is your primary means of access to the:

Hotel Rooms	Elevator___	Stairs___
Fifth Level	Elevator___	Stairs___
Sports Deck	Elevator___	Stairs___

11a. In your opinion, what level functions as the arrival point of the hotel?

12a. Do you see a more logical selection for an arrival point in the hotel?

A POST CONSTRUCTION EVALUATION OF AN INTERIOR LANDSCAPE AND RELATED SPACES

by

GREGORY ALAN WARREN

B. S., Oklahoma State University, 1974

AN ABSTRACT OF A MASTER'S THESIS

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ABSTRACT

This Post Construction Evaluation researches and evaluates the interior landscape at Crown Center Hotel in Kansas City, Missouri. This study demonstrates how one may further enhance the existing design situation and similar interior landscapes by quantitatively evaluating the validity of assumptions encompassed with the initial design concept.

Man is slowly attempting to live harmoniously with nature as he has in the past. However, because these environments are so new, the body of knowledge concerning these niches are very small, producing data that is not comparable.

The methodology the writer utilized involved the exploration of various techniques of evaluation. The provides a better understanding of the various components of a user-based evaluation from which other designers may utilize. From these techniques, only the most appropriate were chosen to best represent the hotel's situation. These were divided into two phases. The first phase consisted of Researcher Participation, utilizing the techniques of erosion, accretion and conversation sampling. The second phase consisted of Behavioral Mapping to trace the movements of the participants throughout the site.

The designer's focus assumptions concerning the site were satisfactorily elicited and in a majority of the situations, were working quite well with respect to the site. However, since this evaluation is one of the first to be implemented upon an interior landscape, there is no comparative data upon which to base the results of the evaluations. Hopefully as similar sites are evaluated, norms can be established for interior landscapes to determine the superiority of one site over another.