

▪ BALBOA PARK ▪

▪ CENTRAL MESA PRECISE PLAN ▪

▪ A P P E N D I X ▪



▪ BALBOA PARK ▪ CENTRAL MESA PRECISE PLAN ▪

Prepared by:
ESTRADA Land Planning, Inc.
The City of San Diego Park and Recreation Department
The City of San Diego Planning Department

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▪ BALBOA PARK CENTRAL MESA PRECISE PLAN ▪

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**ANALYSIS OF THE CARRYING CAPACITY
FOR THE CENTRAL MESA OF
BALBOA PARK**

**PREPARED FOR
ESTRADA LAND PLANNING, INC.**

JUNE 1991

PROJECT NO. 10146

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EXECUTIVE SUMMARY

Economics Research Associates (ERA) has analyzed the carrying capacity of Balboa Park's Central Mesa after the proposed precise plan has been mostly implemented. We conducted this analysis by modeling the current distribution of attendance in the Central Mesa on a typical busy day (called "design day"), given existing public space capacities, to estimate current crowding levels. We compared this current capacity to future capacity given attendance patterns anticipated and improvements proposed under the precise plan.

The following are the major findings of this report. Please read the body of the report for a more thorough understanding of the issues and assumptions.

- As a whole, the Central Mesa currently has sufficient capacity to accommodate a typical busy day's attendance (not including special events). However, there is overcrowding in select public areas, especially the Prado, the North Prado lawns, and the Prado East and Botanical Gardens.
- As visitation grows over time, these bottlenecks will only get worse if the status quo is sustained.
- The proposed precise plan improvements will help mitigate future crowding by redistributing attendance throughout the Central Mesa. Although some popular areas will remain crowded, the most problematic areas such as the Prado will experience relief caused by expansion of visitor space on the western portion of the Prado axis, and the development of other anchor attractions elsewhere on the Central Mesa, such as the Palisades Mall, the Japanese Garden, and the Spanish Village expansion. If programmed as activity areas, these new or expanded public attractions will draw some people away from the Prado, mitigating congestion on the Prado. The Prado will still be crowded, but not nearly as crowded as it would be without these other activity areas.

- The precise plan improvements should attract more people to the park and keep them at the park for longer periods.
- Overall, the Central Mesa will have sufficient capacity after the precise plan is implemented, but crowds will not be distributed evenly.
- Overcrowding would be diminished at the North Prado lawns, but still exist at the Prado East and Botanical lawns, and may be a new phenomenon at the South and Central Palisade's lawns as the precise plan is implemented. Again, overcrowding would be expected and possibly worse without the precise plan improvements due to normal visitation growth over time as San Diego grows.
- Crowding at certain museums, such as the Reuben H. Fleet Space Theater during a design day, and other museums during peak days would probably be alleviated by their expansion under the precise plan, although each museum would need to be analyzed in more detail. The Botanical Building and the Municipal Gym might continue to be overcrowded.
- Finally, parking currently and in the 10-year period analyzed, with or without the precise plan's implementation, appears adequate for design-day attendance if parking at Inspiration Point is included. Future parking supply would probably be deficient during peak special event days. Alternative modes of public and private transportation, which the precise plan proposes, will be needed to accommodate peak-day visitors.

INTRODUCTION

The City of San Diego has commissioned Estrada Land Planning, Inc. (ELP), to develop a precise plan for the Central Mesa area of Balboa Park. ELP completed a general master plan for Balboa Park in 1989. As part of the precise plan effort, ELP has retained Economics Research Associates (ERA) to analyze the current and future carrying capacity of the Central Mesa area, and to examine constraints to expansion such as parking. This study is based on the draft Precise Plan as of May 1, 1991. Future revisions to the precise plan may require new analysis.

ERA's work has included the following tasks:

- Administration and analysis of surveys of Balboa Park institutions to determine attendance levels and peaking characteristics, length of stay, and approximate sizing of visitor areas.
- Working with ELP, a review of the planned additions, expansions, and other changes to various elements of the Central Mesa area under the new precise plan.
- A utilization analysis for various areas of the Central Mesa given typical visitation patterns and tolerable visitor density levels for the different land uses within the Central Mesa.
- The running of our proprietary Attendance Flow Simulation Model to determine carrying capacities, analyze crowd flows, evaluate land use sizing, and assess the impact of the precise plan on the distribution and magnitude of visitors in the Central Mesa area.

It should be noted that it is not ERA's intent to judge the aesthetic value of the mix between built and open space in Balboa Park. Such judgment must rely on public park policy as well as qualitative analysis and is beyond the scope of this report. The focus of this study is on the high-use areas in the park so that careful planning of these areas can help preserve natural areas in the park. ERA has attempted to evaluate the

before and after precise plan capacity of the Central Mesa's high-use areas based on reasonable and consistent assumptions of visitor densities. These density levels represent typical levels considered acceptable and safe for comparable public spaces.

Other Qualifications

The findings in this report should be considered with the following qualifications:

- Existing and future public space within buildings, plazas and pedestrian areas, and landscaped activity areas were estimated by staff at the respective institutions, Balboa Park staff, and ELP. Some of these estimates were more precise than others, particularly the estimates for plazas and pedestrian areas and landscaped activity areas which ELP calculated. The focus of this study was these outdoor public areas; however, visitation in buildings had to be estimated to analyze visitation and capacity at the outdoor public areas. Conclusions regarding holding capacity in individual buildings and institutions are preliminary and would require more in-depth analysis of each building and institution's potential attendance, which was beyond the scope of this study.
- The tolerable density assumed for different types of public space were based on the National Recreation and Parks Association's standards and ERA's experience with large commercial recreation parks, different types of museums, and public recreation facilities. Density standards, however, vary by each locality's aesthetic values and the recreation, artistic, architectural, or educational programs envisioned for the space in question. We believe our assumptions are reasonable, but recognize that they are changeable if public values regarding acceptable density differ or evolve as the precise plan is implemented.

STUDY AREA DESCRIPTION AND ANALYSIS ORGANIZATION

The Central Mesa is the hub of Balboa Park's visitor and cultural areas. This area of the park consisting of approximately 290 acres (including the zoo) accounts for over 90 percent of the park's annual attendance.

For the purposes of our analysis, we have organized the components of the Central Mesa by location and type of land use. This organization is generally consistent with ELP's organization of the Central Mesa for the precise plan. The Central Mesa has been divided into three areas; "Central Mesa - North" which includes all areas within the precise plan north of the Prado area (except for the Veteran's Building and lawn), "Central Mesa - Prado" which includes the Prado institutions and surrounding area, and "Central Mesa - South" which includes the Palisades area and the remaining southern portion of the Central Mesa within the precise plan.

Each geographic area has also been subdivided by type of land use. The land use categories employed are; "Buildings" which include the public space within all museums, meeting rooms, and other institutions, "Plazas and Pedestrian Areas" which include hardscaped outdoor visitor areas, and "Landscaped Activity Areas" which includes high-use or destination open space within the various locations. Our analysis does not include support, administrative, maintenance, or low-use outdoor areas of the Central Mesa.

ATTENDANCE FLOW SIMULATION MODEL DESCRIPTION AND ANALYSIS APPROACH

Model Description

ERA developed the Attendance Flow Simulation Model as a design and operational planning tool for mass attendance attractions and public visitor areas. The model's objective is to optimize the flow of attendance through a multi-component facility. The model simulates a "snap shot" of an attraction at a given point in time showing where all visitors will be located within the attraction. It highlights bottleneck areas and underutilized spaces, and analyzes the impact on visitor distribution of different levels of attendance, various designs, and operating policies.

The model in essence is a probabilistic queuing theory model. Unlike normal queuing theory models which assume random arrivals at visitor elements, the Attendance Flow Simulation Model takes into account the varying popularity of different components within a multi-facility public space. By so doing the model can account for expansions or changes to different facilities which will affect the propensity of visitors to attend the facility.

The model can and should be used on an iterative basis as design for public spaces proceeds. In this way the model can be refined to better represent actual attendance characteristics as the nature of attendance to existing facilities is better understood, as the facility design itself becomes more sophisticated and responsive to visitor needs, and as park operating policies evolve. The model is very dynamic and can be used to simulate a variety of design, operational, and attendance characteristics of a given facility.

The model contains various input and output items which are explained below.

1. Attendance Parameters — These figures represent the projected attendance patterns at the facility. Peak in-Park attendance is the key factor. This is the total number of persons in the park at a peak hour on the day of attendance being modeled. In this case, an early afternoon hour on an August weekend day.
2. Design Day — Design day is a typical busy day, such as an August weekend day, for which the park is planned. Design-day level of visitation is normally less than the busiest days of the year, such as special event days, since designing for these busiest days would over-commit capital resources and could result in extreme over-capacity during most days of the year.
3. Visitation Probability — This represents the probability of a visitor attending the given component during his stay at the park. This factor can be determined at existing facilities based on known attendance parameters,

or can be estimated for planned facilities based on their assumed popularity and other factors. Visitation probability can alternatively be viewed as level of service. For example a facility with a visitation probability of 20 percent would indicate that given the other assumptions of the model the facility should be capable of servicing 20 percent of overall visitors to the entire attraction.

4. Element Length of Stay — Element length of stay is the amount of time spent by a visitor at a specific facility, on average.
5. Probable Length of Stay — This is an average or weighted value for individual components of an attraction which when added indicate the average length of stay at the entire attraction.
6. Instantaneous Probability — Represents the probability at one point in time of a visitor being at a particular facility.
7. Carrying Capacity — Carrying capacity indicates the holding capacity of the particular space given the other assumptions.
8. Tolerable Density — Tolerable density is the acceptable level of crowding which generally would produce a comfortable and safe experience for a visitor in the given space.
9. Sizing Factors — The attraction size requirements indicates the size of the area required to accommodate its particular carrying capacity, while current design and variance show the difference between required and actual space.

Analysis Approach

Although this model can be applied in numerous ways to a particular attraction, ERA has confined the present analysis to two basic simulations. The first, Balboa, evaluates the Central Mesa in its current condition. In this simulation we have chosen to model peak in-park attendance on design day. Although the model can also simulate

peak days, ERA felt it was more valuable to model design day. Design day is the level of attendance for which a facility should be planned. Facilities should not be planned for peak days due to capital constraints, and because they will appear empty and lose some of their dynamism on other days. In the case of the Central Mesa, design day represents an average crowded August weekend day. Design day usually is the equivalent to the average of the 10th to 15th busiest days of the year, and excludes special events. Peak in-park on design day occurs between 2:00 and 3:00 in the afternoon in the Central Mesa.

Although special events can be modeled, we have assumed in this simulation that no special events are occurring at any of the outdoor venues, or lawn areas. A more typical daytime utilization of these areas is assumed, with sitting, strolling, and picnicking being the primary assumed uses. Special events would have to be modeled separately since their attendance flow varies considerably depending on the special event.

The second simulation, Balboa2, analyzes the Central Mesa after the implementation of the precise plan. In this model the same approach is used as in Balboa1, although modifications have been made to reflect increased attendance and physical changes to the park. The detailed assumptions of the visitor models are discussed below.

ANALYSIS ASSUMPTIONS

The assumptions and other analyses used as input into Balboa1, the model of existing conditions at Balboa Park, are discussed below. Adjustments made to Balboa2, the post precise plan model are discussed later.

1. Attendance Parameters — Current attendance was calculated using actual attendance figures supplied by the various Balboa park facilities. These figures were adjusted to reflect nonattraction visits (such as general strolling in the park) and multiple-attraction visits (to account for attendees who visit more than one attraction during their stay) in the following manner.

	<u>Design Day</u>	<u>Peak Hour</u>
Visits to Central Mesa Attractions*	40,000	18,000
Nonattraction Visits (@33% total)	<u>20,000</u>	<u>9,000</u>
Total Visits (including visits to more than one attraction)	60,000	27,000
Number of People or Non-Duplicated Attendance (total visits divided by 1.5)	40,000	18,000

*Total attendance recorded or estimated at attractions. Visits are greater than the actual number of people in the park since some people visit more than one attraction.

The adjustment factors were derived from the Balboa Park visitor surveys conducted during Easter 1989 and June 1988 by the City Parks and Recreation Department. *The 1982 Balboa Park Visitor Study* prepared by the Pekarek Group was also reviewed, though our estimates are not directly comparable since we analyzed a design day (assumed to be an August weekend day) in this study while the Pekarek Group analyzed average daily attendance during peak months, which included weekdays. Also, the Pekarek Group study analyzed visitation at picnic areas but did not provide an estimate of nonattraction visits, such as strolling through the Prado. Actual attendance figures for the various facilities are shown in appendix Tables A-1 through A-3.

2. Visitation Probability — In the case where actual data were available, visitation probability approximates daily, or peak hour facility attendance divided by total nonduplicated attendance. In some cases adjustments were made to reflect various factors such as uncertainty of reported data, aberrational peaking characteristics for certain spaces, and other factors. Where specific data were not available, a variety of methodologies were employed to arrive at visitation probability. These include: using parkwide ratios of

peak hour and design day to monthly and annual attendance where these figures were available; applying survey data percentages of visitor utilization of specific areas; analyzing visitor circulation patterns; evaluating actual attraction holding capacities and design features; assessing attraction popularity; reviewing comments from personal observations of crowding by ERA and ELP staff; and combinations of the above.

3. Length of Stay — Length of stay for various areas was determined based on survey data, evaluation of the type of space, analysis of visitor circulation patterns, and the relationship between various visitor destination points. Most length of stay estimates were provided by staff at the Balboa Park institutions.

4. Density — The density figures used in the model under the caption "*Tolerable Density*" indicate typical density planning factors for public spaces. Table 1 illustrates density planning factors for a variety of public spaces. As shown, density planning factors can range from 3 to more than 20,000 square feet per person depending on the land use. For indoor spaces, and outdoor commercial facilities (theme parks, worlds fairs, and also zoos) density planning factors have fairly narrow ranges and have been well established by economic planners and architects. For large outdoor public spaces, density planning factors become more subject to taste and public policy than absolute necessity. However, the National Recreation and Park Association compiles sizing, market, and attendance factors for many of the nation's parks. Using urban park standards developed in major U.S. cities provides a range of acceptable crowding levels for planning purposes. These figures combined with ERA figures developed in previous studies for public parks provide the basis for the ranges shown in the table and used in the model. These ranges represent generally acceptable and safe levels of visitor crowding in park green areas, but are not absolute and can be modified based on the desired aesthetic appeal of the park, the various needs

Table 1
TYPICAL DENSITY PLANNING FACTORS
IN PUBLIC SPACES

<u>Space</u>	<u>Square Feet per Person</u>
Elevator ¹	3- 4
Queuing Area	5- 10
Movie Theater	15- 20
Restaurant	25- 30
Museum Exhibit Area	35- 45
Public Beach ²	40- 50
State/Local Fairgrounds	50- 60
Theme Park	70- 90
Zoo	150- 300
Public Picnic Areas ²	400- 800
Neighborhood Playgrounds ²	500- 600
Community Parks—Overall ²	300- 1,000
Multipurpose Playfield ²	1,000- 1,100
Baseball/Softball Field ²	3,000- 4,000
Golf Course	20,000-40,000

¹ Maximum utilization.

² NRPA standards.

Source: The National Recreation and Parks Association (NRPA)
and Economics Research Associates.

of particular visitor groups, individual park's physical characteristics, and the overall visitor experience desired.

5. **Sizing** — Sizing is based on actual sizing provided by the various facilities and ELP.

It should be noted that ERA has been retained to perform one key task: assess the pre and post precise plan carrying capacity of the Central Mesa's public areas. ERA's Attendance Flow Simulation Model is a very detailed and complex tool to use in undertaking this task. The model can and has been used over years of planning on a variety of projects to refine design and the model itself as it applies to a particular project. Within the time and fee constraints of this assignment, ERA has used the model to its utmost in answering the questions posed to us. However, a more thorough and sophisticated model of the Central Mesa could be developed with a more detailed visitor survey (preferably during an August weekend), including a further assessment of multiple visitations, length of stay, and attendance characteristics in the pedestrian and green areas of the park, further interaction with the planning firm on the details of the specific plan, and interfacing with the city to discuss and establish appropriate and desired levels of visitor density.

MODEL RESULTS AND CONCLUSIONS

The results and conclusions of the two models are discussed below.

Base Case Model Balboa1 - Central Mesa Current Conditions

A summary of the results of Balboa1 is shown in Table 2, followed by the detailed results of the model in Table 3. Figures 1 and 2 present a graphic representation of the activity areas analyzed under current conditions. The following are the major conclusions of this analysis:

- Design day is estimated at 40,000 persons presently with a peak in-park attendance of approximately 18,000 persons, including the zoo.

Table 2
 Balboa Park
 ATTENDANCE FLOW SIMULATION
 SUMMARY

bn	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instant- aneous Probability	Carrying Capacity (persons)	Tolerable Density (sq/ft pers) 1/	Attraction Size Reqmnts (sq.ft.)	Current Design (sq.ft.)	Variance (sq.ft.)
	Central Mesa							

	1,150	39	23.44%	4,219	45	189,422	499,800	310,378
	152	12	7.10%	1,278	139	177,691	436,000	258,309
	248	9	5.33%	959	908	871,088	1,909,000	1,037,912
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	1,550	60	35.87%	6,457		1,238,201	2,844,800	1,606,599
	Zoo							
	240	108	64.13%	11,543	300	3,462,977	3,485,000	22,023
	1,790	168	100.00%	18,000	261	4,701,179	6,329,800	1,628,621
	Total Central Mesa							

1/ Tolerable density estimated could vary depending on activity, program, or exhibit design considerations.

Sources: Economical Research Associates

Table 3
BALBOA PARK
ATTENDANCE FLOW SIMULATION
EXISTING CONDITIONS

SENSITIVITY ANALYSIS: Balboa 1b - base case revised

RUN DATE: 6-June-91

Attendance Parameters		Design day	40,000										
Peak In-Park on Design Day		18,000											
Area	Element L.O.S. (min.)	Visitation prob. Total stay	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sqft/person) 1/	Attraction Size Reqmnts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)				
Central Mesa - North													
Buildings													
Spanish Village	15	5.00%	1	0.45%	80	40	3,206	4,000	794				
Subtotal Buildings	15		1	0.45%	80		3,206	4,000	794				
Plazas and Pedestrian Areas													
San Diego Zoo	240	45.00%	108	64.13%	11,543	300	3,462,977	3,485,000	22,023				
Carousel	15	2.00%	0	0.18%	32	300	9,619	26,000	16,381				
Spanish Village/Prado North	15	7.00%	1	0.62%	112	125	14,028	48,000	33,972				
Subtotal Plaza and Pedestrian Areas	270		109	64.93%	11,688		3,486,625	3,559,000	72,375				
Landscaped Activity Areas 3/													
Zoo Walk Area 4/	3	5.00%	0	0.09%	16	750	12,024	61,000	48,976				
Miniature Train	15	2.00%	0	0.18%	32	1500	48,097	144,000	95,903				
North Prado Lawns	20	5.00%	1	0.59%	107	750	80,162	65,000	(15,162)				
Subtotal Landscaped Activity Areas	38		1	0.86%	155		140,283	270,000	129,717				
Total Central Mesa - North	323		112	66.24%	11,923		3,630,114	3,833,000	202,886				

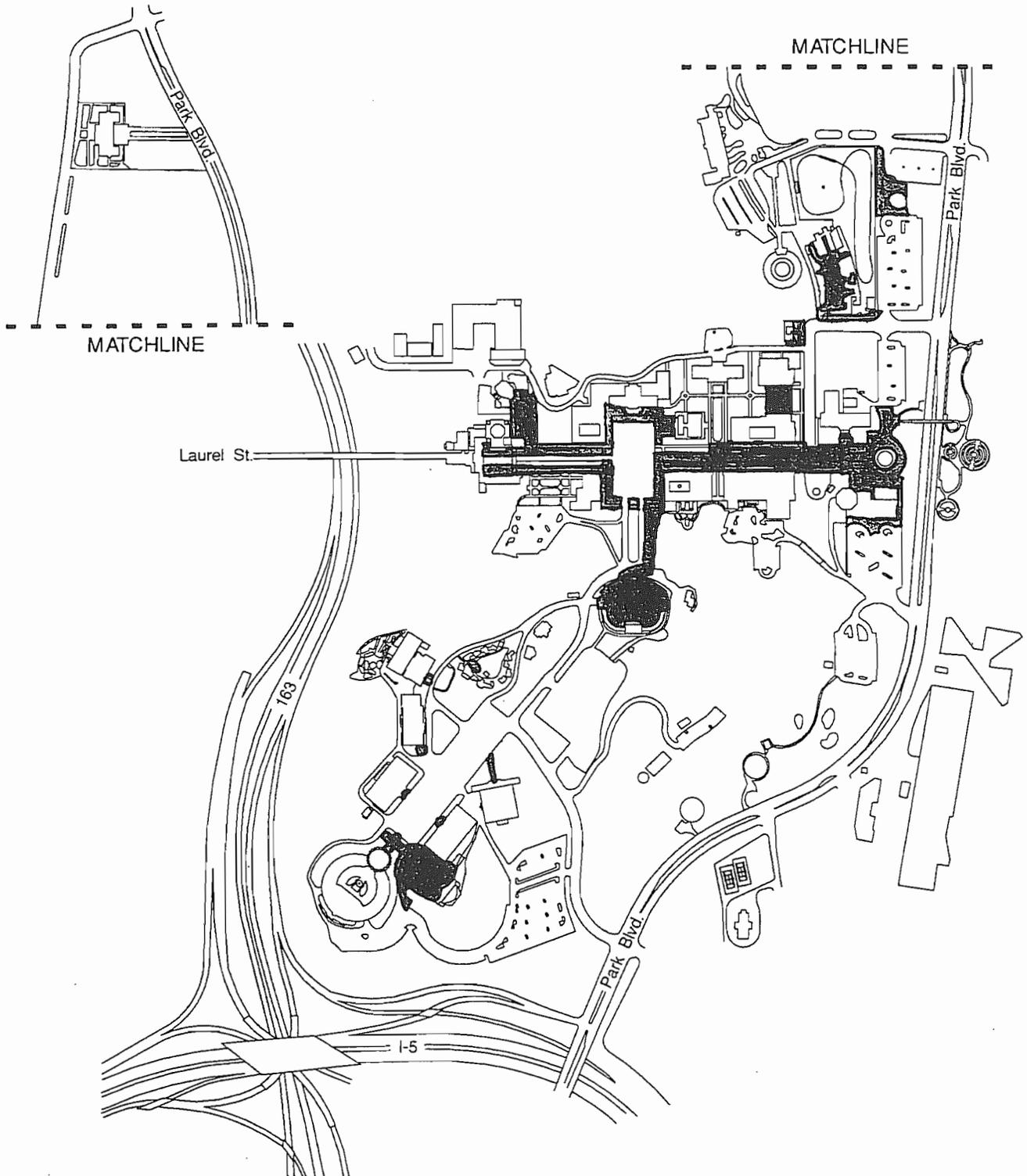
Source: Economics Research Associates

Areas	Visitation prob. Total stay	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sqft/persons) 1/	Attraction Size Reqrmts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)
Central Mesa - Prado									
Buildings									
Botanical Building	5.00%	10	1	0.30%	53	300	16,032	14,000	(2,032)
Casa del Prado	3.00%	30	1	0.53%	96	35	3,367	55,000	51,633
Casa del Prado Theater	4.00%	90	4	2.14%	385	20	7,696	10,000	2,304
Hall of Champions	1.00%	30	0	0.18%	32	40	1,283	14,000	12,717
House of Hospitality 5/	3.00%	45	1	0.80%	144	45	6,493	20,000	13,507
Museum of Art 6/	5.00%	60	3	1.78%	321	40	12,826	31,000	18,174
Museum of Man	3.00%	50	2	0.89%	160	40	6,413	29,000	22,587
Museum of Photographic Arts	1.00%	25	0	0.15%	27	40	1,069	3,800	2,731
Natural History Museum	6.00%	90	5	3.21%	577	45	25,972	37,000	11,028
Old Globe Theater 7/	5.00%	120	6	3.56%	641	20	12,826	57,000	44,174
Reuben H. Fleet Space Theater	6.00%	115	7	4.10%	737	30	22,125	22,000	(125)
San Diego Art Institute	1.00%	30	0	0.18%	32	40	1,283	5,000	3,717
San Diego Historical Society	0.50%	30	0	0.09%	16	35	561	22,000	21,439
San Diego Model Railroad Museum	5.00%	30	2	0.89%	160	60	9,619	11,000	1,381
Timken Art Gallery	1.50%	25	0	0.22%	40	40	1,603	6,000	4,397
Subtotal Buildings		780	32	19.02%	3,423		129,167	336,800	207,633
Plazas and Pedestrian Areas									
The Prado	40.00%	15	6	3.56%	641	125	80,162	74,000	(6,162)
Plaza Balboa	25.00%	10	3	1.48%	267	125	33,401	57,000	23,599
Plaza Panama	8.00%	5	0	0.24%	43	125	5,344	48,000	42,656
West Prado 8/	8.00%	7	1	0.33%	60	500	29,927	52,000	22,073
Subtotal Plazas and Pedestrian Areas		37	9	5.62%	1,011		148,833	231,000	82,167
Landscaped Activity Areas									
Zero Garden	3.00%	10	0	0.18%	32	750	24,048	22,000	(2,048)
Prado East and Botanical Garden	20.00%	10	2	1.19%	214	750	160,323	100,000	(60,323)
Alcazar Garden 9/	5.00%	5	0	0.15%	27	1000	26,721	30,000	3,279
Subtotal Landscaped Activity Areas		25	3	1.51%	273		211,092	152,000	(59,092)
Total Central Mesa - Prado		842	44	26.15%	4,707		489,092	719,800	230,708

Source: Economics Research Associates

Area	Visitation prob. Total #/yr	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sqft/person) 1/	Attraction Size Reqmnts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)
Central Mesa - South									
Buildings									
Aerospace Museum	5.00%	60	3	1.78%	321	50	16,032	53,000	36,968
Municipal Gym	1.00%	90	1	0.53%	96	300	28,858	28,000	(858)
Balboa Park Club	2.00%	30	1	0.36%	64	35	2,245	17,000	14,755
Centro Cultural de la Raza	1.00%	45	0	0.27%	48	40	1,924	6,000	4,076
Federal Building	1.00%	60	1	0.36%	64	35	2,245	20,000	17,755
International Houses	1.00%	25	0	0.15%	27	35	935	10,000	9,065
San Diego Auto Museum	2.00%	45	1	0.53%	96	50	4,810	25,000	20,190
Subtotal Buildings		355	7	3.98%	716		57,048	159,000	101,952
Plazas and Pedestrian Areas									
Palisades Mall	3.00%	5	0	0.09%	16	125	2,004	13,000	10,996
Centro Cultural	0.00%	30	0	0.00%	0	125	0	0	0
Organ Pavilion 10/	3.00%	30	1	0.53%	96	30	2,886	74,000	71,114
Starlight Bowl 10/	0.50%	20	0	0.06%	11	30	321	44,000	43,679
Subtotal Plazas and Pedestrian Areas		85	1	0.68%	123		5,210	131,000	125,790
Landscaped Activity Areas									
Central and South Palisades	4.00%	10	0	0.24%	43	750	32,065	48,000	15,935
Palm Canyon	1.00%	15	0	0.09%	16	7500	120,242	200,000	79,758
North Palisades	4.00%	10	0	0.24%	43	750	32,065	61,000	28,935
Federal Building	5.00%	15	1	0.45%	80	750	60,121	100,000	39,879
President Way/Park Blvd. Lawns	4.00%	25	1	0.59%	107	750	80,162	87,000	6,838
Pepper Grove	3.00%	60	2	1.07%	192	750	144,291	283,000	138,709
Archery	0.50%	35	0	0.10%	19	1000	18,704	645,000	626,296
Japanese Garden	2.00%	15	0	0.18%	32	1000	32,065	63,000	30,935
Subtotal Landscaped Activity Areas		185	5	2.95%	532		519,714	1,487,000	967,286
Total Central Mesa - South		625	13	7.62%	1,371		581,973	1,777,000	1,195,027
Total Balboa Park Central Mesa									
		1,790	168	100.00%	18,000	261	4,701,179	6,329,800	1,628,621

- 1/ Tolerable density estimated for museums could vary depending on exhibit design considerations.
- 2/ Public Space
- 3/ Destination, high use green space modeled for average weekend day use, does not reflect special event use of particular areas.
- 4/ Includes pedestrian walkway.
- 5/ Includes Cafe del Rey/Moro Garden.
- 6/ Does not include sculpture garden.
- 7/ Includes seating and lobby space of all three theaters, including the amphitheater.
- 8/ Typical use, does not reflect theater load and unload. West Prado includes Old Globe Plaza and West Prado lawn.
- 9/ Includes planters.
- 10/ Average use, does not reflect special event/concert use. Organ Pavilion includes mall lawn.



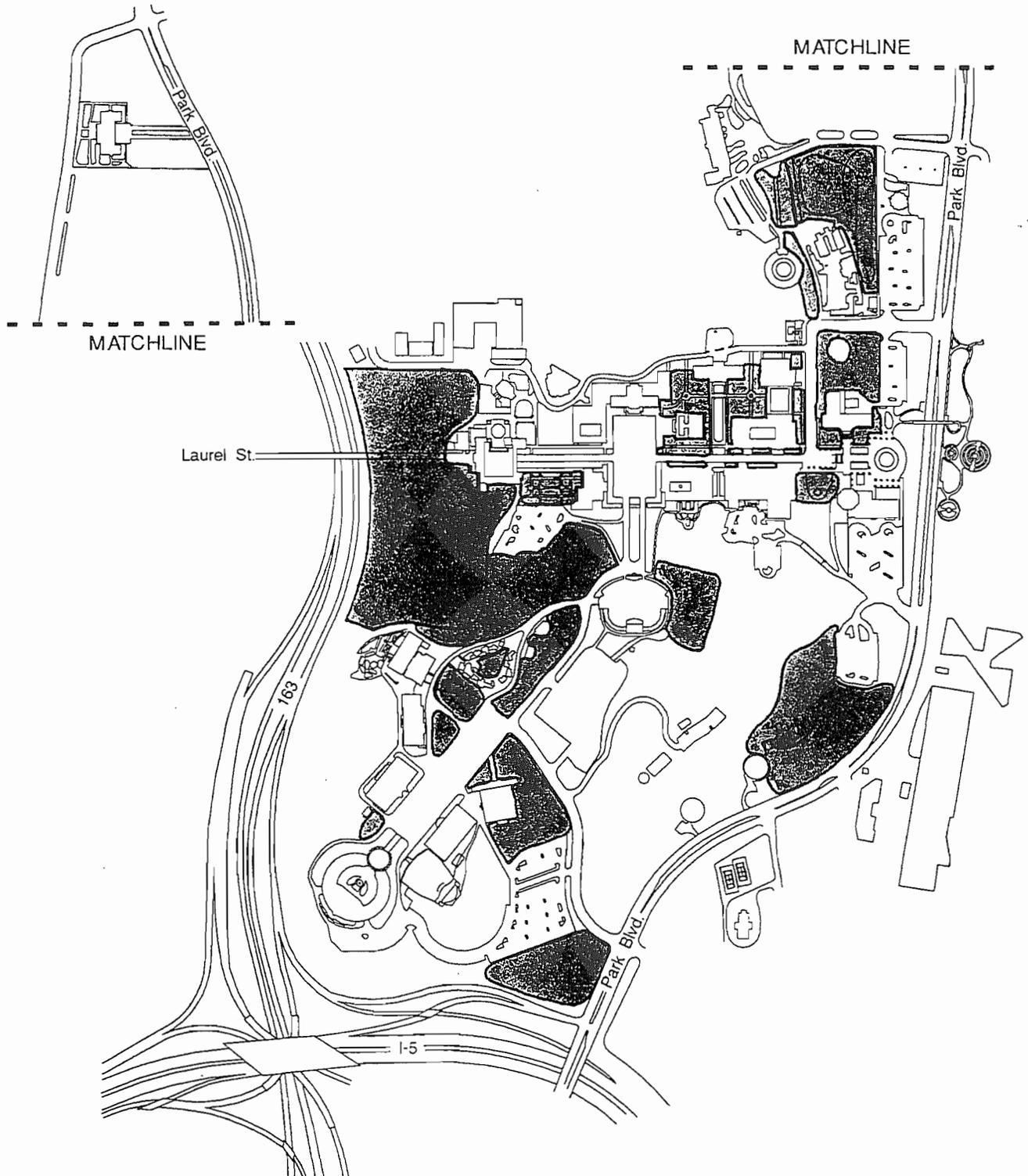
ERA Report:
Existing Plazas and Pedestrian Areas

Figure
1



April 30, 1991

ESTRADA Land Planning



ERA Report:
Existing Landscaped Activity Areas

Figure
2



ONE ACRE



April 30, 1991

ESTRADA Land Planning

- The overall average length of stay for a Central Mesa visitor not including zoo visitors is about one hour. The average length of stay when accounting for zoo visitors is about two hours and 48 minutes.
- Carrying capacity of the Central Mesa (design day, peak in-park) not including the zoo is almost 6,500 persons; with 4,200 being indoors, 1,200 in plazas and pedestrian areas, and almost 1,000 in landscaped activity areas.
- The zoo, which accounts for over 64 percent of peak in-park visitation has a design day peak in-park carrying capacity of over 11,500 persons, and is the key attendance component of the Central Mesa.
- Overall, a surplus of building space is indicated. This is primarily due to low usage of meeting spaces relative to their size, and underutilization of some museums.
- Some individual institutions indicate deficiencies of space on design day such as the Fleet Museum, the Botanical Building, and the Municipal Gym. On peak days other museums such as the Natural History Museum and others may also experience unacceptable crowding levels.
- Overall, the plazas, pedestrian areas, and landscaped activity areas show acceptable levels of visitor density on design day.
- Some individual pedestrian and landscaped activity areas, however, indicate crowding. These include the Prado, which is roughly 19 percent undersized given the density assumptions, the Prado East and Botanical Garden and the North Prado lawns.

The model indicates that overall the Central Mesa has more than sufficient building, pedestrian and landscaped activity areas to accommodate design-day attendance. However, the concentration of visitors in the Prado and immediately surrounding areas creates visitor density levels in these areas on busy days which may be

unacceptable. Almost 80 percent of the Central Mesa's visitors in pedestrian and plaza areas are in the Prado and environs at any one time, while this area only accounts for 59 percent of total pedestrian and plaza area acreage (excluding the starlight Bowl). ERA would recommend that coordinated operational actions be taken to flatten visitor peaking in the day (early bird and late afternoon discounts, nighttime activities and group events, etc.) and that design action be taken to spread visitation throughout the Central Mesa, and away from high crowd concentrations in the central Prado area.

Balboa2 - Central Mesa Post Precise Plan

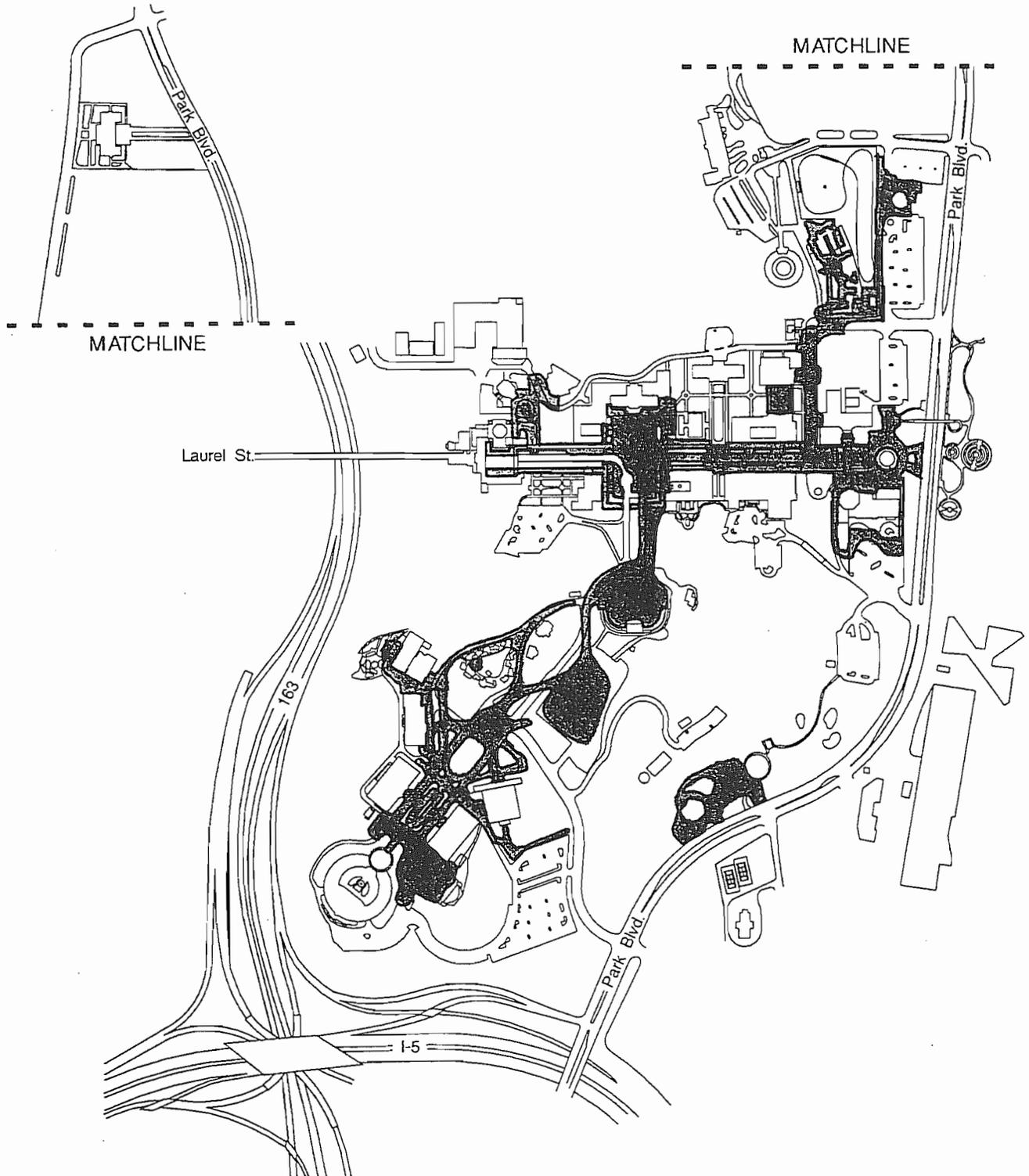
In the second model, adjustments were made to reflect the increased attendance at Balboa Park from general market growth and facility expansions, and to account for the planned physical changes to the park. Parking constraints to growth were also analyzed. Figures 3 and 4 present a graphic representation of the activity areas analyzed under the precise plan scenario.

Parking Constraints to Growth

As part of the post Precise Plan model, ERA analyzed constraints to attendance growth caused by parking limitations. This analysis is shown in Table 4.

As shown, ERA analyzed current and post precise plan demand and supply for parking in the Central Mesa, as well as future demand and supply without the precise plan improvements. In commercial visitor attractions parking is designed for peak days because if there is insufficient parking the facility loses potential visitors and their revenues. For public facilities, parking should also be planned for peaks, land and budget permitting, so that the facilities can best service public demand.

Our analysis indicates that design day peak hour demand for parking in the Central Mesa is currently some 5,300 spaces. Demand on peak days (we have calculated peak day demand at 30 percent higher than design day although absolute peaks such as Christmas on the Prado may be even higher) is estimated at some 6,400 spaces. The Central Mesa presently has a parking inventory of roughly 7,400 spaces including on-street parking and Inspiration Point (see Appendix Table A-5 for Central



ERA Report:
Proposed Plazas and Pedestrian Areas

Figure
3

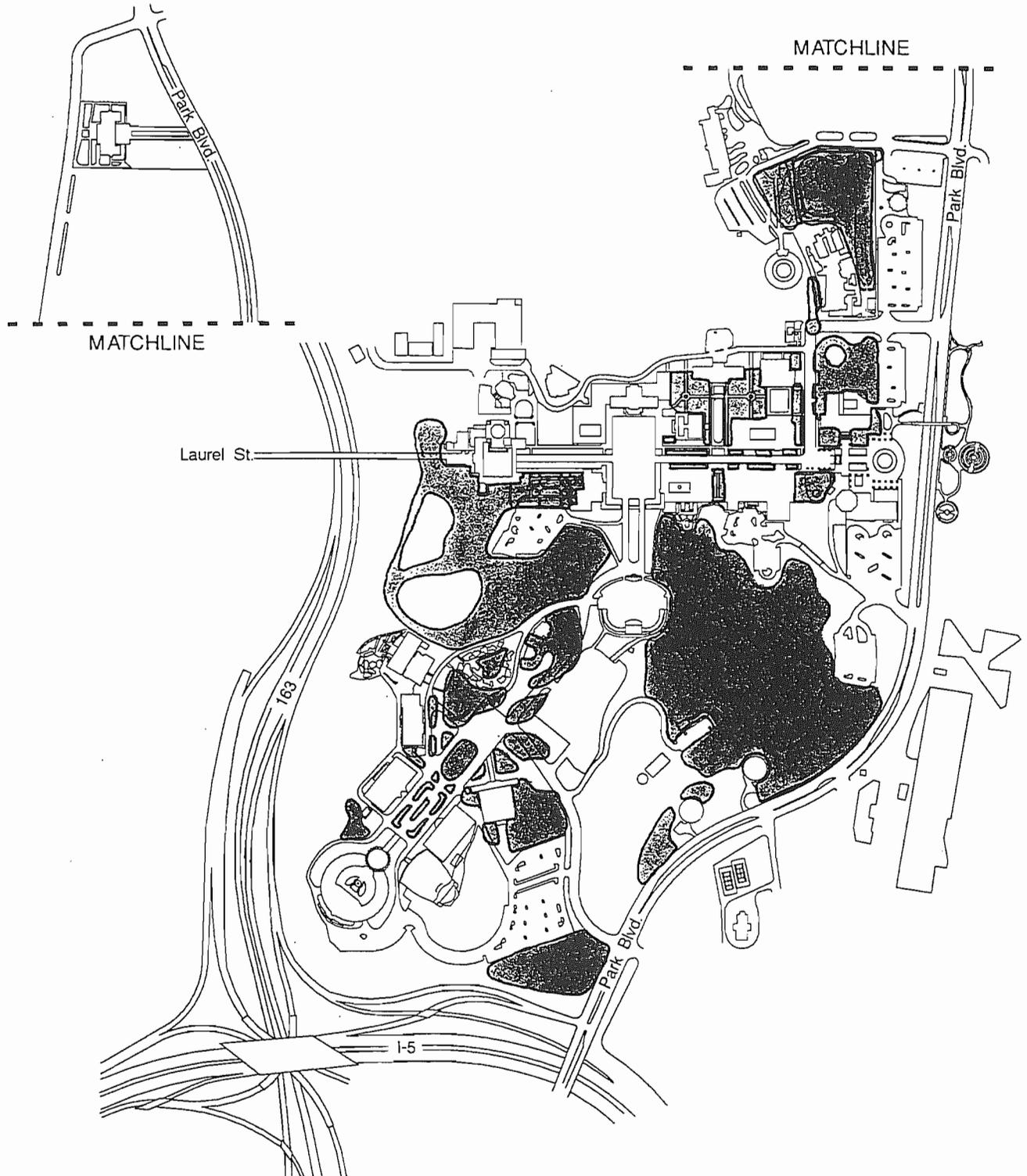


ONE ACRE



April 30, 1991

ESTRADA Land Planning



ERA Report:
Proposed Landscaped Activity Areas

Figure
4



April 30, 1991

ESTRA Land Planning

Table 4

CENTRAL MESA PARKING
DEMAND AND SUPPLY

	Current (1991)	Without Precise Plan (2001)	Post Precise Plan (2001)
Design Day	40,000	46,000	49,000
Peak In-Park Design Day	18,000	21,000	22,000
Automobile Arrivals (@82%) ¹	14,800	17,130	18,040
 <u>Parking Space Demand</u>			
Design Day (@2.8 persons/car) ¹	5,271	6,118	6,442
Peak Day (design day plus 30%)	6,852	7,953	8,374
Central Mesa Parking Inventory (spaces) ²	7,399	7,399	7,520
 <u>Parking Surplus(+)/Shortage (-)</u>			
Design Day	+2,128	+1,281	+1,078
Peak Day	+ 547	- 554	- 854

¹ From August 1989 and Easter 1988 visitor surveys. Assumes same percentage automobile arrivals post precise plan.

² Including Inspiration Point and on-street parking.

Source: Estrada Land Planning Inc., Balboa Park Visitor Surveys 1988 and 1989, and Economics Research Associates.

Mesa parking areas and capacities). Thus, at present, Central Mesa parking is sufficient for design day (71 percent occupancy) and on peak days (93 percent occupancy). Inspiration Point's parking is critical, especially in peak days.

Future parking demand without the precise plan improvements, based on an assumed 1.5 percent annual growth rate in demand (we assumed a lower annual growth rate without the precise plan improvements since these improvements would induce additional growth and visitation), would result in adequate parking supply on design day (83 percent occupancy), but a deficit on peak days (7 percent deficit).

To calculate post precise plan parking demand, ERA projected attendance for the Central Mesa to 2001 assuming attendance can grow unrestrained by parking (discussed in more detail below) at a greater 2 percent annual rate due to induced growth caused by expanded attractions. We then compared the increased demand caused by higher attendance to the planned increase in parking inventory under the new precise plan. As indicated, parking space demand would expand to some 6,440 spaces on design day, and 8,370 spaces on peak days, such as special event days. Planned Central Mesa parking under the precise plan is approximately 7,520 spaces. This analysis indicates that post precise plan there will be an adequate supply on design day (86 percent occupancy), but a shortage on peak days of over 850 spaces for a 10 percent deficit.

In sum, our parking analysis indicates that attendance growth in the Central Mesa will be constrained by parking on peak days unless the percent of arrivals by automobile can be reduced or additional parking spaces built. If not addressed, the parking shortage on the Central Mesa will level peak days at the park, and thus constrain total annual attendance growth.

For the purposes of our analysis we have modeled post precise plan attendance assuming there will be sufficient parking to accommodate design day crowds. We have taken this approach for several reasons. First, although there are clear shortages of parking projected on peak days, there is generally sufficient, albeit fully utilized, parking for design day attendance both currently and post precise plan. This would imply that although peak days and annual attendance may be constrained, the park may still be able to achieve design day attendance on the order of that projected. Secondly,

the precise plan calls for transportation measures to mitigate the acknowledged parking problem, and we have assumed that these will be implemented to the degree that design day parking needs will be fully and comfortably accommodated. These measures include a park tram system to move people throughout the Central Mesa, joint use of parking facilities outside the park with free public shuttle service to the park, and enhanced bicycle facilities at the park. These steps will encourage nonautomotive trips to the park which will relieve parking demand in the future. Without these public and alternative transit measures, peak days could experience unacceptable parking shortages which would constrain visitation.

Adjustments to Base Case Model

To reflect the changes in the Central Mesa after the precise plan implementation, ERA has made several adjustments to the base case model. These are discussed below.

1. Attendance Increase — Annual attendance at the Central Mesa will increase over the implementation period of the precise plan. This will occur due to resident and tourist market growth in San Diego, and from increased popularity of Central Mesa attractions resulting from expansion and improvements. ERA has projected attendance growth ten years to 2001. At this point in time most of the precise plan's major improvements will be complete. The text table below shows pertinent measures for Balboa Park and San Diego growth.

A. Annual Attendance Growth Balboa Park

1957-1981	1.8%
1986-1990	2.8%

B. Tourism to San Diego

Number of Visits 1980-1989 (Source: Conv. and Visitors Bureau)	3.3%
---	------

C. Attractions Growth

Zoo - 1980-1989	1.2%
Fleet Museum:	
1973-1989	3.0%
1989-2010 (Source: EIR)	2.0%
Sea World 1980-1989	2.7%

D. Population

1986-2010 (Source: SourcePoint)	1.6%
------------------------------------	------

Based on the above information we estimate that attendance will increase in the Central Mesa at an average annual growth rate of 2 percent. This yields a design-day attendance of 49,000 by the year 2001. Attendance for various attractions and the park as a whole will fluctuate from year to year during this period, with some attractions experiencing significant short-term growth immediately after improvements. However, over the long term, attendance is expected to stabilize at a moderate annual growth level. For the purposes of the model ERA has assumed that attendance peaking characteristics will remain essentially the same after the precise plan.

2. Visitation Probability — Visitation probability has been adjusted for various attractions to reflect expansions to individual facilities and the opening of new visitor areas in the park. Visitation probability has also been adjusted to reflect the creation of strong visitor magnet areas such as the expanded Japanese Gardens, new plazas and pedestrian areas such as the Palisades Mall, and expansions to facilities such as the Spanish Village and Miniature Train area.
3. Length of Stay — Length of stay has been increased to areas which have been significantly improved, and also applied to new areas created under the precise plan.

4. Sizing — Changes in sizing under the precise plan were made.

Balboa2 Post Precise Plan Model Results and Conclusions

A summary of the post precise plan model is shown in Table 5, while the detailed model is shown in Table 6. The results and our conclusions relative to the carrying capacity of the Central Mesa after the precise plan are highlighted below.

- Design day attendance is projected at 49,000 persons after the precise plan with peak in-park attendance of 22,000 persons.
- Length of stay in the Central Mesa is projected to expand to one hour and 19 minutes from the current one hour, excluding the zoo. Including zoo visitors, total length of stay is projected at slightly over three hours.
- Design day peak in-park carrying capacity is projected to expand by about 44 percent to 9,300 persons under the precise plan not including the zoo. The distribution of visitors in the Central Mesa is projected to shift towards outdoor areas under the precise plan with 4,000 persons in plazas, pedestrian, and landscaped activity areas compared with 2,200 persons presently. After the precise plan it is estimated that about 43 percent of Central Mesa visitation will be in outdoor areas whereas currently about 35 percent of visitors are in outdoor areas, not including the zoo.
- Zoo carrying capacity is projected to expand, although expansion beyond the 12,700 persons shown would be restricted by parking and possibly public transportation limitations.
- The model indicates that the precise plan successfully eliminates overcrowding in certain museums on design and peak day by the planned museum expansion programs. No significant shortages in built space are indicated under the precise plan during design day, except for the Botanical Building and Municipal Gym.

Table 5
 BALBOA PARK
 ATTENDANCE FLOW SIMULATION
 POST PRECISE PLAN
 SUMMARY

Area	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instant- aneous Probability	Carrying Capacity (persons)	Tolerable Density (sq ft/pegr) 1/	Attraction Size Reqmts (sq ft.)	Current Design (sq ft.)	Variance (sq ft.)
Central Mesa								
----- Buildings*	1,220	45	24.04%	5,289	46	243,419	656,800	400,437
Other Plaza and Pedestrian Areas	177	21	11.18%	2,459	130	320,002	896,000	575,998
Landscaped Activity Area	238	13	7.06%	1,532	1,062	1,647,760	1,925,000	277,220

Subtotal Central Mesa (excl. zoo)	1,635	79	42.27%	9,300		2,211,201	3,457,800	1,253,655
Zoo	240	108	57.73%	12,700	300	3,810,033	3,485,000	(325,033)
Total Central Mesa	1,875	187	100.00%	22,000	274	6,021,234	6,942,800	928,622

1/ Tolerable density estimated could vary depending on activity, program, or exhibit design considerations.

Source: Economics Research Associates

Table 6
BALBOA PARK
ATTENDANCE FLOW SIMULATION
POST-PRECISE PLAN

SENSITIVITY ANALYSIS: Balboa 2b - post precise plan

RUN DATE: 06-June-91

Attendance Parameters	Design day	Peak In-Part on Design Day	Visitation prob. Total stay	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sqft/pers) 1/	Attraction Size Reqmts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)
Central Mesa - North				20	1	0.53%	118	40	4,704	9,000	4,296
Buildings				20	1	0.53%	118		4,704	9,000	4,296
Spanish Village	5.00%			240	108	57.73%	12,700	300	3,810,033	3,485,000	(325,033)
Subtotal Buildings				15	0	0.16%	35	300	10,583	30,000	19,417
Plazas and Pedestrian Areas	8.00%			20	2	0.86%	188	125	23,519	91,000	67,481
San Diego Zoo				275	110	58.74%	12,924		3,844,135	3,606,000	(238,135)
Carousel											
Spanish Village/Prado North											
Subtotal Plazas and Pedestrian Areas											
Landscaped Activity Areas 3/											
Zoo Walk Area 4/	5.00%			3	0	0.08%	18	750	13,229	57,000	43,771
Miniature Train	3.00%			20	1	0.32%	71	1000	70,556	135,000	64,444
North Prado Lawns	4.00%			20	1	0.43%	94	750	70,556	78,000	7,444
Subtotal Landscaped Activity Areas				43	2	0.83%	182		154,342	270,000	115,658
Total Central Mesa - North				338	112	60.11%	13,223		4,003,180	3,885,000	(118,180)

Source: Economica Research Associates

Areas	Visitation prob. Total day	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sqft/persons) 1/	Attraction Size Reqrmts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)
Central Mesa - Prado									
Buildings									
Botanical Building	5.00%	10	1	0.27%	59	300	17,639	14,000	(3,639)
Casa del Prado	3.00%	30	1	0.48%	106	35	3,704	55,000	51,296
Casa del Prado Theater	4.00%	90	4	1.92%	423	20	8,467	10,000	1,533
Hall of Champions	1.00%	30	0	0.16%	35	40	1,411	14,000	12,589
House of Hospitality 5/	4.00%	40	2	0.86%	188	45	8,467	20,000	11,533
Museum of Art 6/	5.00%	60	3	1.60%	353	40	14,111	31,000	16,889
Museum of Man	3.00%	50	2	0.80%	176	40	7,056	37,000	37,000
Museum of Photographic Arts	1.00%	25	0	0.13%	29	40	1,176	3,800	2,624
Natural History Museum	6.00%	100	6	3.21%	706	45	31,750	80,000	48,250
Old Globe Theater 7/	5.00%	120	6	3.21%	706	20	14,111	57,000	42,889
Reuben H. Fleet Space Theater	8.00%	130	10	5.56%	1,223	40	48,919	63,000	14,081
San Diego Art Institute	1.00%	30	0	0.16%	35	40	1,411	5,000	3,589
San Diego Historical Society	0.50%	30	0	0.08%	18	35	617	22,000	21,383
San Diego Model Railroad Museum	5.00%	30	2	0.80%	176	60	10,583	11,000	417
Timken Art Gallery	1.50%	25	0	0.20%	44	40	1,764	6,000	4,236
Subtotal Buildings		800	36	19.44%	4,277		171,187	428,800	264,669
Plazas and Pedestrian Areas									
The Prado	35.00%	15	5	2.81%	617	125	77,171	74,000	(3,171)
Plaza Balboa	20.00%	10	2	1.07%	235	125	29,398	65,000	35,602
Plaza Panama	20.00%	10	2	1.07%	235	125	29,398	91,000	61,602
West Prado 8/	8.00%	7	1	0.30%	66	125	8,232	57,000	48,768
Subtotal Plazas and Pedestrian Areas		42	10	5.24%	1,154		144,199	287,000	142,801
Landscaped Activity Areas									
Zoro Garden	3.00%	10	0	0.16%	35	750	26,459	21,000	(5,459)
Prado East and Botanical Lawn	18.00%	10	2	0.96%	212	750	158,751	100,000	(58,751)
Alcazar Garden 9/	5.00%	5	0	0.13%	29	1000	29,398	30,000	602
Subtotal Landscaped Activity Areas		25	2	1.26%	276		214,608	151,000	(63,608)
Total Central Mesa - Prado		867	49	25.94%	5,707		529,994	866,800	343,861

Source: Economics Research Associates

Area	Visitation prob. Total day	Element L.O.S. (min.)	Probable L.O.S. (min.)	Instantaneous Probability	Carrying Capacity (persons)	Tolerable Density (sq.ft./pers.) 1/	Attraction Size Reqmts (sq.ft.)	Current Design (sq.ft.) 2/	Variance (sq.ft.)
Central Mesa - South									
Buildings									
Aeropedc Museum	5.00%	60	3	1.60%	353	50	17,639	53,000	35,361
Municipal Gym	1.00%	90	1	0.48%	106	300	31,750	28,000	(3,750)
Balboa Park Club	2.00%	30	1	0.32%	71	35	2,469	17,000	14,531
Centro Cultural de la Raza	1.00%	45	0	0.24%	53	40	2,117	6,000	3,883
World Beat	1.00%	45	0	0.24%	53	40	2,117	6,000	3,883
Federal Building	1.00%	60	1	0.32%	71	35	2,469	20,000	17,531
International Houses	1.00%	25	0	0.13%	29	35	1,029	14,000	12,971
San Diego Auto Museum	3.00%	45	1	0.72%	159	50	7,938	55,000	47,062
Subtotal Buildings		400	8	4.06%	894		67,528	199,000	131,472
Plazas and Pedestrian Areas									
Palisades Mall	35.00%	20	7	3.74%	823	125	102,894	296,000	193,106
Centro Cultural/World Beat	4.00%	30	1	0.64%	141	250	35,278	52,000	16,722
Organ Pavilion and Mall 10/	3.00%	30	1	0.48%	106	30	3,175	96,000	92,825
Starlight Bowl 10/	0.50%	20	0	0.05%	12	30	353	44,000	43,647
Subtotal Plaza and Pedestrian Areas		100	9	4.92%	1,082		141,700	488,000	346,300
Landscaped Activity Areas									
South and Central Palisades	15.00%	15	2	1.20%	265	750	198,439	131,000	(67,439)
Palm Canyon	1.50%	20	0	0.16%	35	7500	264,586	327,000	62,414
North Palisades	7.00%	10	1	0.37%	82	750	61,737	70,000	8,263
Federal Building	5.00%	15	1	0.40%	88	750	66,146	70,000	3,854
Presidents Way/Park Blvd. Lawns	4.00%	25	1	0.53%	118	750	88,195	87,000	(1,195)
Pepper Grove	3.00%	60	2	0.96%	212	750	158,751	296,000	137,249
Japanese Garden	10.00%	25	3	1.34%	294	1500	440,976	523,000	82,024
Subtotal Landscaped Activity Areas		170	9	4.97%	1,094		1,278,630	1,504,000	225,170
Total Central Mesa - South									
Total Balboa Park Central Mesa		1,875	187	100.00%	22,000	274	6,021,234	6,942,800	928,622

- 1/ Tolerable density estimated for museums could vary depending on exhibit design considerations.
- 2/ Public Space
- 3/ Destination, high use green space modeled for average weekend day use, does not reflect special event use of particular areas.
- 4/ Includes pedestrian walkway.
- 5/ Includes Calc del Rey Moro garden.
- 6/ Does not include sculpture garden.
- 7/ Includes seating and lobby space of all three theaters, including the amphitheater.
- 8/ Typical use, does not reflect theater load and unload. West Prado includes Old Globe Plaza and West Prado lawns.
- 9/ Includes planters.
- 10/ Average use, does not reflect special event/concert use.

- The model shows that new expansions to the museums will create additional crowding in some of the adjacent pedestrian and landscaped activity areas. However, the key problem area, the Prado (which still shows under-capacity), shows less crowding due to the expansion of other adjacent areas which can serve as "relief valves" to the Prado. One area which appears to remain crowded is the Prado East and Botanical Lawn which is "building locked", and can not be expanded significantly. The South and Central Palisades lawns may be undersized for design day crowds as well since they will become more popular activity areas under the precise plan. Operational techniques to ease crowding in these two areas should be considered, such as encouraging more activity on the Palisades Mall to draw people away from the lawns.

In sum, the post precise plan model indicates a positive redistribution of design day attendance throughout the Central Mesa. Although some popular areas will remain crowded, the most problematic areas such as the Prado will experience relief caused by an expansion of visitor space on the western portion of the Prado axis, and the provision and expansion of other anchor uses on the perimeter of the Central Mesa core area such as the Plaza de Panama, the Palisades Mall, the Japanese Garden and the Spanish Village expansion. Prior to the precise plan, almost 80 percent of Central Mesa visitors were contained in 59 percent of its plazas and pedestrian space in the Prado area (excluding the Starlight Bowl). After the precise plan the percentage of total Central Mesa visitors in the Prado pedestrian area drops to 47 percent, while the Prado area comprises 34 percent of the plazas and pedestrian areas (excluding the Starlight Bowl). ERA feels that the precise plan proposes positive solutions to key issues facing the Central Mesa relative to carrying capacity and, with the exception of possible parking shortages during peak days and crowding on the South and Central Palisades' lawns and the Prado East and Botanical lawns, alleviates the majority of the crowd density issues which were raised in our analysis. Although popular areas will still be crowded during average busy days, most will still be within capacity, and they will not be as crowded as they would be without the precise plan improvements.

APPENDIX

Table A-1

ANNUAL ATTENDANCE AT BALBOA PARK

INSTITUTION	1986	1987	1988	1989	1990
Aerospace Museum	201,159	260,150	230,795	231,296	237,896
Centro Cultural de la Raza	47,054	39,242	13,697	19,803	22,350
Hall of Champions	118,288	147,207	85,404	79,388	57,127
Historical Society	5,616	32,418	53,647	60,847	44,066
Japanese Gardens ¹	n/a	n/a	n/a	n/a	21,637
Museum of Art	442,844	347,840	416,404	651,359	474,268
Museum of Man	263,405	247,510	194,343	191,030	199,226
Museum of Photographic Arts	45,059	87,449	77,886	73,976	62,143
Natural History Museum	248,526	277,078	317,248	317,930	305,094
Old Globe Theatre	237,826	255,377	243,550	244,806	195,892
Reuben H. Fleet Space Theatre	475,472	682,807	577,357	646,830	640,034
San Diego Art Institute	77,057	43,765	28,983	28,300	28,350
San Diego Automotive Museum ¹	n/a	n/a	n/a	75,068	100,994
San Diego Model Railroad	177,647	160,924	160,715	197,889	210,303
Timken Art Gallery	78,355	77,000	91,255	117,441	97,676
TOTAL	2,418,308	2,658,767	2,491,284	2,935,963	2,697,056

1. The attendance figures for the Japanese Garden reflect the last quarter (10/90-12/90) of the year. The figures for the Automotive Museum reflect June through December of 1989, and all of 1990.

Source: Respective Museum Curators and Public Relations Staff, Balboa Park Management Office, Economics Research Associates

Table A-2

MONTHLY ATTENDANCE AT BALBOA PARK

Facility	JUNE			JULY			AUGUST			DECEMBER		
	1989	1990	Average	1989	1990	Average	1989	1990	Average	1989	1990	Average
	Aerospace Museum	19,956	20,994	20,475	25,710	27,991	26,851	29,155	27,529	28,342	16,970	20,479
Balboa Park Club	5,600	5,000	5,300	22,225	7,800	15,013	21,260	8,500	14,880	3,500	11,500	7,500
Casa Del Prado	9,039	47,725	28,382	10,156	36,975	23,566	11,390	34,090	22,740	18,950	32,205	25,578
Centro Cultural De La Raza	1,000	3,100	2,050	750	1,800	1,275	750	2,200	1,475	1,500	1,750	1,625
Hall of Champions	4,373	4,222	4,298	6,754	n/a	3,377	13,419	6,371	9,895	19,033	12,172	15,603
House of Hospitality	30,000	40,971	35,486	46,359	49,115	47,737	51,717	52,918	52,318	51,350	53,101	52,226
Japanese Garden	n/a	n/a	0	n/a	n/a	0	n/a	n/a	0	n/a	10,000	5,000
Museum of Art	24,735	30,149	27,442	30,124	59,458	44,791	25,246	56,684	40,965	150,858	29,603	90,231
Museum of Man	20,000	35,000	27,500	13,806	13,447	13,627	17,963	15,600	16,782	24,804	25,292	25,048
Museum of Photographic Arts	4,097	6,500	5,299	5,036	6,365	5,701	6,018	7,621	6,820	6,528	3,679	5,104
Natural History Museum	24,662	79,144	51,903	27,315	22,306	24,811	33,861	24,000	28,931	33,594	23,642	28,618
Old Globe Theatre	25,000	23,031	24,016	38,675	21,000	29,838	18,914	17,036	17,975	7,328	2,574	4,951
Organ Pavilion	11,500	33,000	22,250	31,000	36,000	33,500	26,300	31,000	28,650	15,000	25,000	20,000
Outdoor Special Events in the Park	6,500	28,000	17,250	26,000	16,000	21,000	26,000	18,500	22,250	90,000	110,000	100,000
Puppet Theatre	4,660	2,500	3,580	11,700	2,600	7,150	14,200	3,300	8,750	2,500	6,000	4,250
Recital Hall	3,480	3,000	3,240	13,200	5,600	9,400	14,475	6,200	10,338	3,000	7,200	5,100
Reuben H. Fleet Space Theatre	40,000	60,000	50,000	40,500	67,600	54,050	81,956	73,331	77,644	50,200	56,028	53,114
San Diego Art Institute	1,500	2,100	1,800	1,800	2,800	2,300	1,800	3,100	2,450	2,500	2,150	2,325
San Diego Automotive Museum	n/a	8,243	4,122	12,108	11,168	11,638	19,100	10,600	14,850	11,160	10,122	10,641
San Diego Historical Society	5,000	4,100	4,550	5,000	8,107	6,554	6	8,700	4,353	14,322	1,541	7,932
San Diego Model Railroad	15,046	18,093	16,570	14,983	20,401	17,692	14,950	16,657	15,804	27,714	19,207	23,461
San Diego Zoo	300,000	270,000	285,000	436,442	349,916	393,179	432,632	387,192	409,912	129,058	250,000	189,529
Timken Art Gallery	8,234	6,640	7,437	8,686	10,221	9,454	10,438	10,261	10,350	17,890	11,551	14,721
Veterans War Memorial	5,800	6,800	6,300	4,700	7,200	5,950	2,500	68,500	35,500	7,000	7,500	7,250
TOTAL	570,182	738,312	654,247	833,029	783,870	538,966	874,050	889,890	881,970	704,759	732,296	718,528

Source: Respective Museum Curators and Public Relations Staff, Balboa Park Management Office, Economic Research Associates

TABLE A-3

MONTHLY ATTENDANCE AT THE
SAN DIEGO ZOO

SAN DIEGO ZOO

MONTH/YEAR	1989	1990	Average
January	192,751	169,074	180,913
February	201,956	194,580	198,268
March	297,160	237,776	267,468
April	252,542	270,984	261,763
May	262,993	281,087	272,040
June	300,000	270,000	285,000
July	436,442	349,916	393,179
August	432,632	387,192	409,912
September	244,788	223,787	234,288
October	290,376	327,108	308,742
November	219,194	181,379	200,287
December	129,058	250,000	189,529
ANNUAL TOTALS	3,259,892	3,142,883	3,201,388

Source: San Diego Zoo Public Relations Staff, Economics Research Associates

Table A-4
PUBLIC SPACE USAGE

<u>Location</u>	<u>Size (sq.ft.)</u>	<u>Percent Public</u>	<u>Proposed Size (sq.ft.)</u>	<u>Percent Public</u>
Centro C.R.	9,000	68%	--	--
Hall of Champions	21,000	67	--	--
House of Hospitality	11,000	100	--	--
House of Pacific Relations Hall of Nations	10,700	98	--	--
Model Railroad	22,100	50	--	--
Photographic	7,600	50	--	--
Natural History	60,000	75	--	--
Reuben H. Fleet Aerospace	50,000	44	115,787	--
Art Institute	6,000	80	--	--
Automotive	35,000	71	75,000	87%
Historical Society	24,000	92	44,000	--
Museum of Art	87,000	36	--	--
Museum of Man	52,000	56	--	--
Spanish Village	5,008	90	--	--
Starlight	54,000	82	66,000	67
Timken Art Gallery	7,500	73	--	-

Source: Curators and Staff from the respective institutions, April 1991.

Table A-5
PARKING INVENTORY FOR CENTRAL MESA¹

	<u>Existing Spaces</u>	<u>Proposed Spaces</u>
<u>On-Site Lots</u>		
Aerospace Museum/Federal Building	533	497
Alcazar Gardens	141	128
Botanical Building	29	0
Carousel North	99	74
Carousel South	220	221
Casa de Balboa	92	116
Centro/Worldbeat	0	11
Gold Gulch	54	38
Natural History Museum	101	99
Organ Pavilion ²	323	1,000
Pan American Plaza	294	0
Pepper Grove	118	121
Reuben H. Fleet Space Museum	168	162
San Diego Zoo	<u>3,361</u>	<u>3,361</u>
Subtotal	5,607	5,828
<u>On-Street Spaces</u>		
Zoo Place	120±	120±
Park Boulevard	360±	340±
Village Place	<u>80</u>	<u>0</u>
Subtotal	560±	460±
<u>Off Site</u>		
Inspiration Point ¹	1,232	1,232
Total	<u>7,399</u>	<u>7,520</u>

¹ Subject to change with precise plan revisions.

² The number of proposed parking spaces at the Organ Pavilion ranges from 1,000 to 1,500.

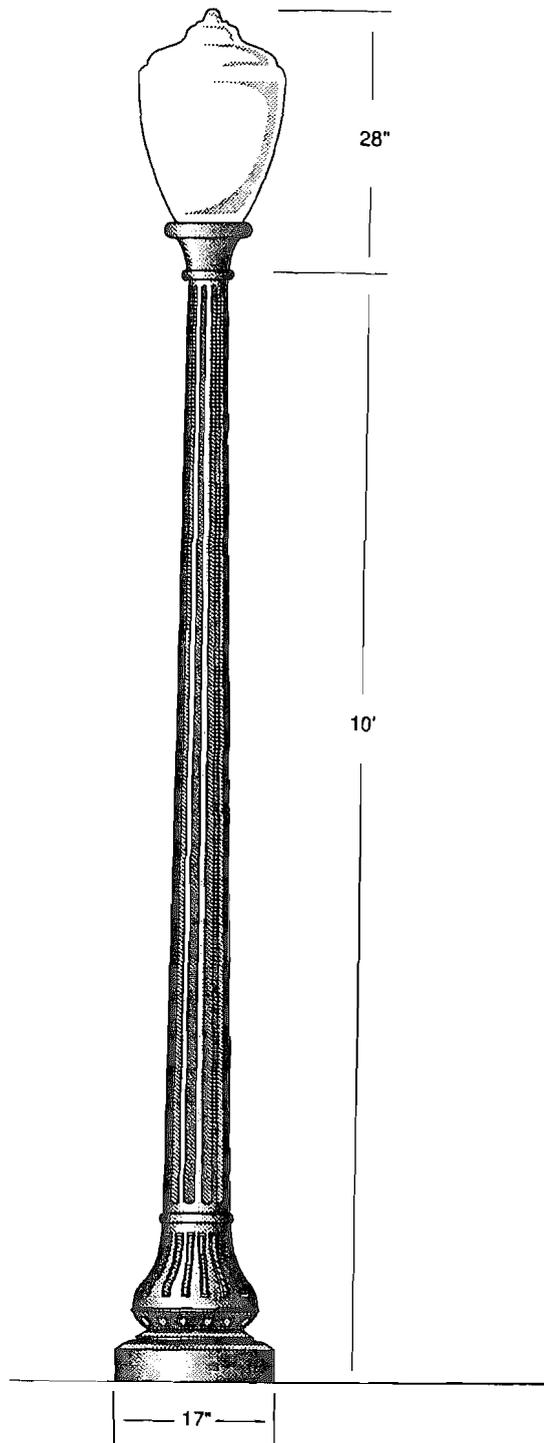
Site Furnishings Catalogue



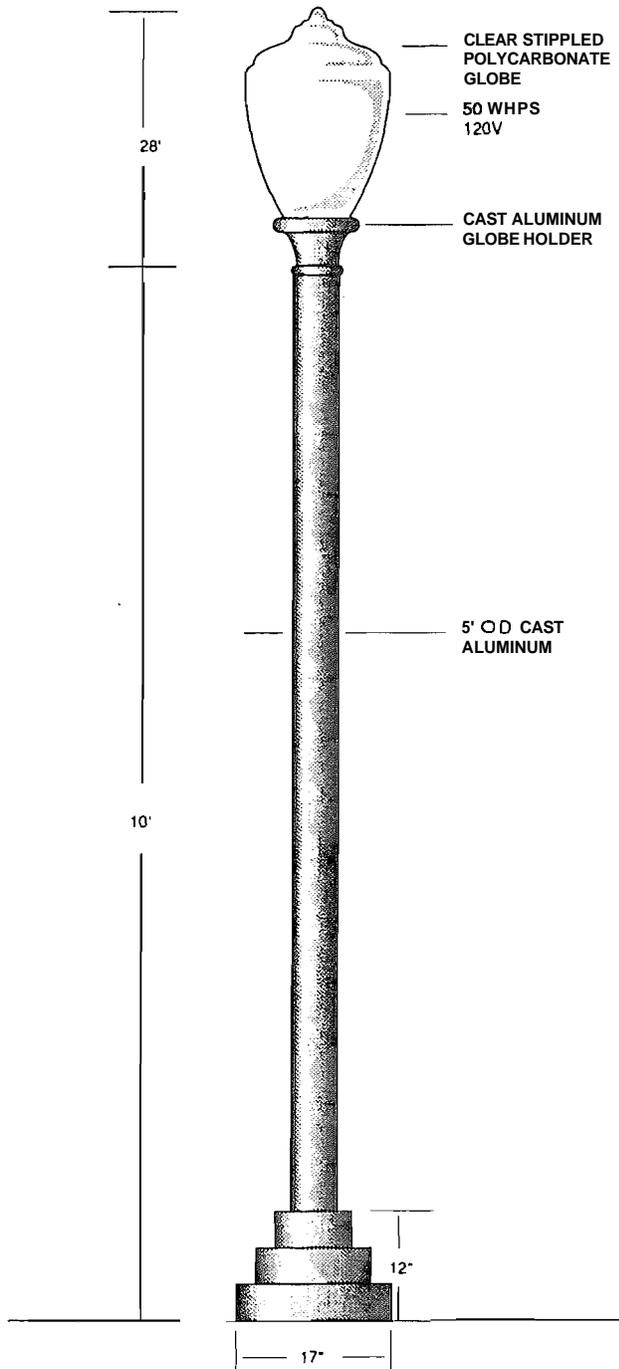
Prado Light Standards

Western Lighting Standards
Capistrano Series CA10 (or equal).
Custom fixture as shown. Color shall be Frazee Shutter Green 6125N gloss enamel. Install per manufacturer's specifications.
Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499



Light Standards'



Palisades Light Standards

Western Light Standards with custom 10' pole and 17" diameter base fixture (or equal). Brushed aluminum finish. Install per manufacturer's specifications. Available through:

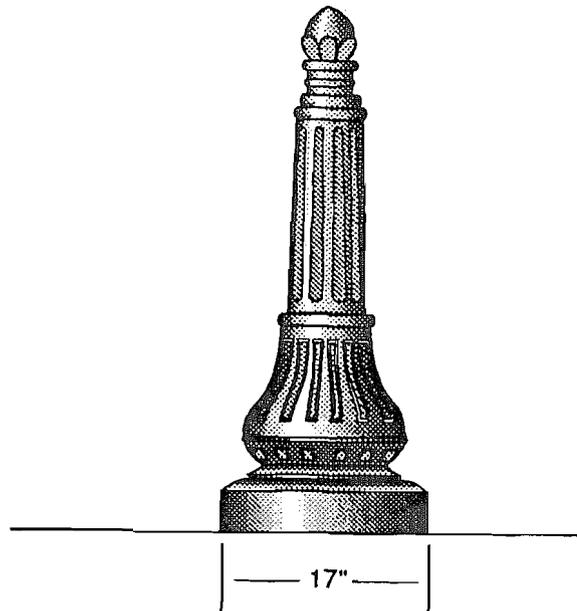
WESTERN LIGHTING STANDARDS
325 West Rider
Ferris, CA 92370
(714) 657-5499

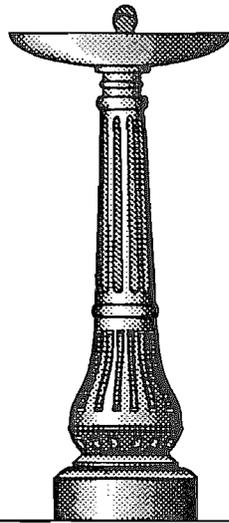


Removable Bollard

Western Lighting Standards
Capistrano series custom design
with 17" base as shown (or equal).
Color to match light standards.
Install per manufacturer's
specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Pems, CA 92370
(714) 657-5499



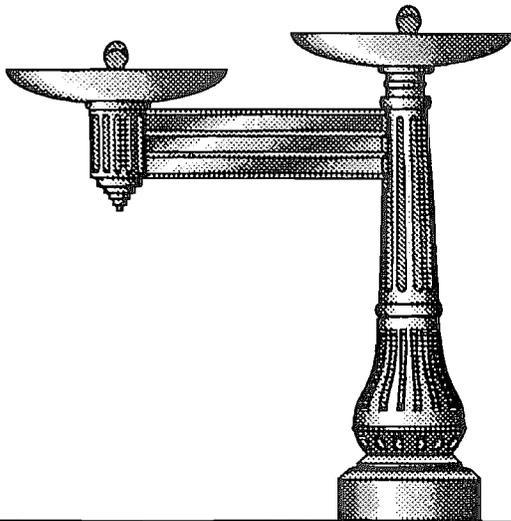


— 12" —

Prado Drinking Fountain

Western Lighting Standards Capistrano series mini base as shown (or equal). Color to match light standards. Install per manufacturer's specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499



— 12" —

Prado Drinking Fountain

Western Lighting Standards Capistrano series wheelchair accessible pedestal mini base as shown (or equal). Color to match light standards. Install per manufacturer's specifications. Available through:

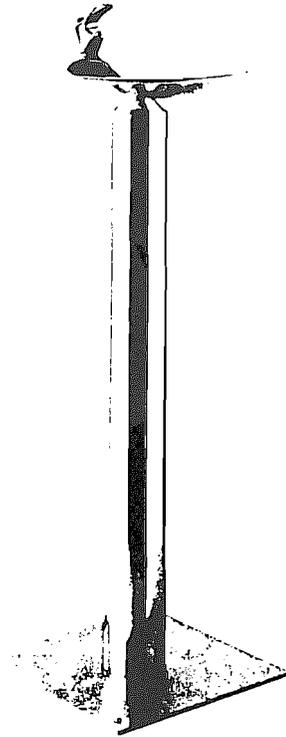
WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499



Palisades Drinking Fountain

Haws Pedestal model #3353 (or equal) with receptor and pedestal in stainless steel with #4 satin finish. Haws Wheelchair accessible pedestal model #3180 (or equal) with outdoor pedestal fountain with built-in sandtrap. Install per manufacturer's specifications. Available through:

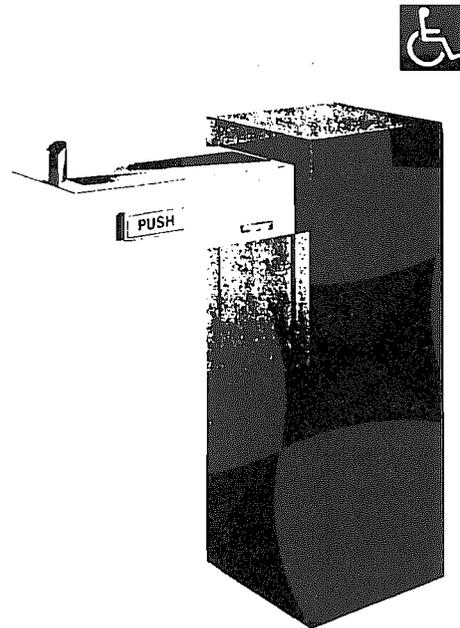
HAWS DRINKING FAUCET COMPANY
Fourth & Page Sheets
P.O. Box 1999
Berkeley, CA 94701
(415) 525-5801



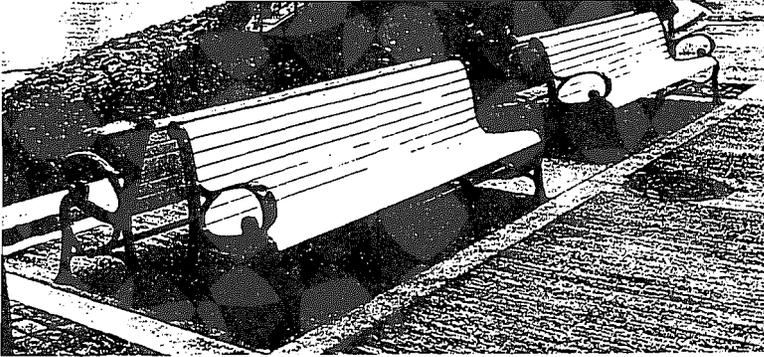
Palisades Drinking Fountain

Haws Wheelchair accessible pedestal model #3180 (or equal) with outdoor pedestal fountain with built-in sandtrap. Install per manufacturer's specifications. Available through:

HAWS DRINKING FAUCET COMPANY
Fourth & Page Sheets
P.O. Box 1999
Berkeley, CA 94701
(415) 525-5801



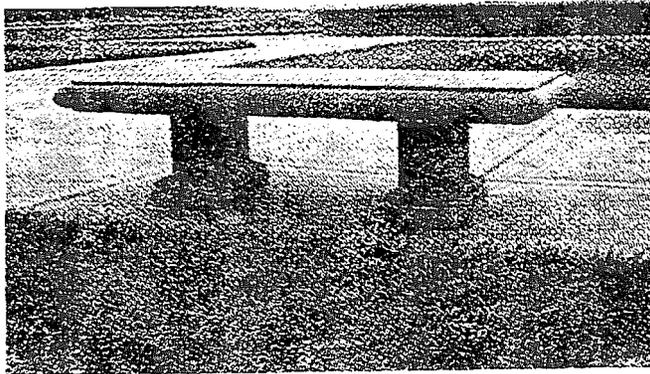
Drinking Fountain



Prado Cast Iron/ Wood Bench

TimberForm Site Complements model numbers 2118-x and 2119-x (or equal) with cast iron supports and patterned wood slats. Bench depth is 2' - 2.5" and height is 2' - 9.5". Seat height is 1' - 5" with surface mounting and wood size 1.5" x 2.5". Length to be determined. Finish to be powder coating color RAL 6009. Install per manufacturer's specifications. Available through:

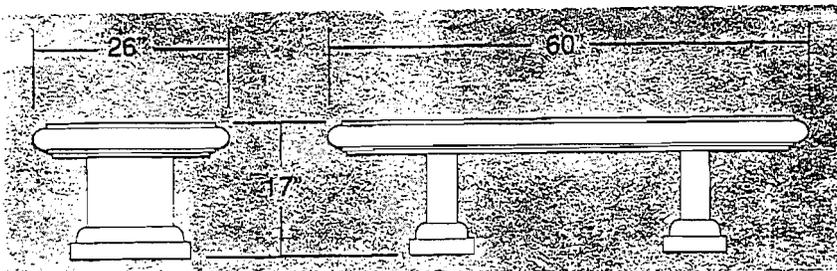
COLUMBIA CASCADE TIMBER COMPANY
1975 S.W. Fifth Avenue
Portland, OR 97201
1-800-547-1940



Prado Concrete Bench

Dura Art Stone cast stone Coronado bench 6U, minimum 6' length, installed with epoxy adhesive, nordic cream color and sacked smooth finish, order number: S-6U-E-S-13-SK (or equal). 26" wide seat, 17" height and minimum 7 2 length. Install per manufacturer's specifications. Available through:

DURA ART STONE
11010 Live Oak
Fontana, CA 92335
(800) 821-1120
(714) 350-9000

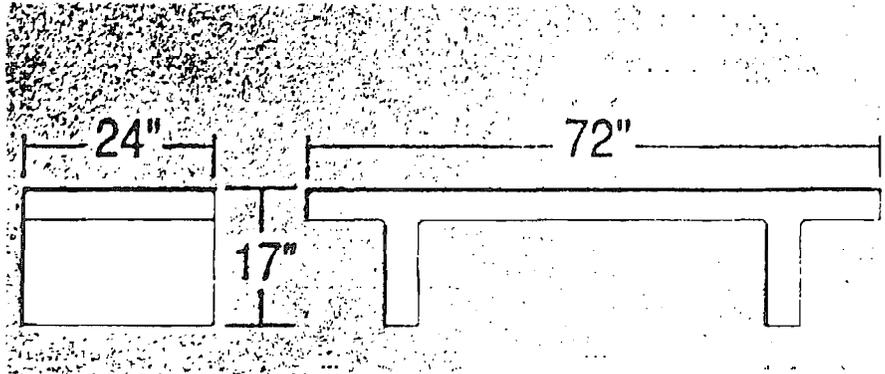


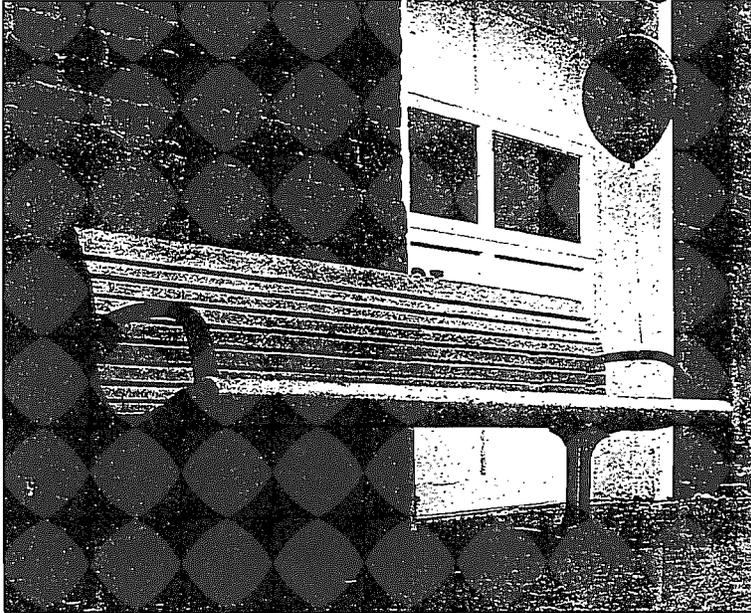


Park Concrete Bench

Dura Art Stone cast stone S-6B bench, epoxy adhesive installed, nordic cream color, sacked smooth finish, order number: S-6B-E-S-13-SK (or equal). 24" wide, 17" height, 72" long. Install per manufacturer's specifications. Available through:

DURA ART STONE
11010 Live Oak
Fontana, CA 92335
(800) 821-1120
(714) 350-9000





Palisades Bench (2)

(1) Landscape Forms Gretchen's Bench of Jarrah wood with back and armrest style supports in 72" or 96" length, model #GR3005-BA-length to be determined (or equal).
(2) Gretchen's Bench of Jarrah wood freestanding style support in 72" or 96" length, model #GR 3005-FS-length to be determined (or equal). Install per manufacturer's specifications. Available through:

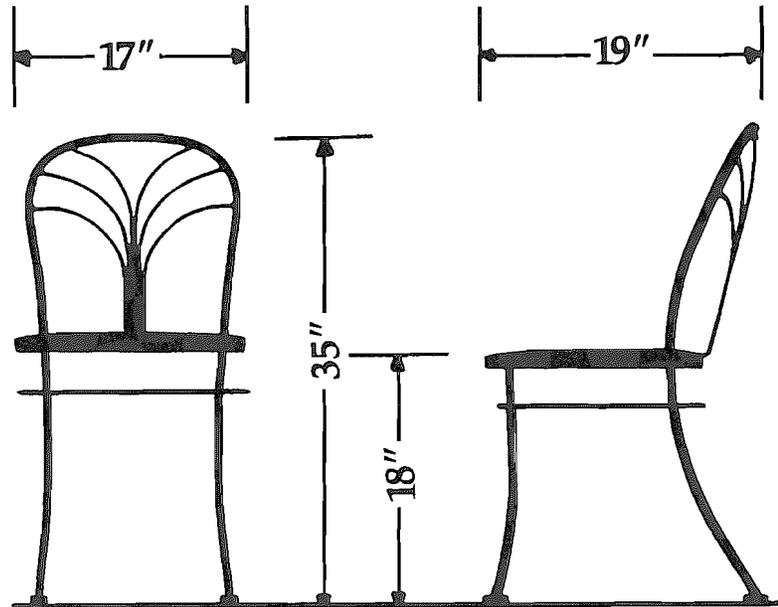
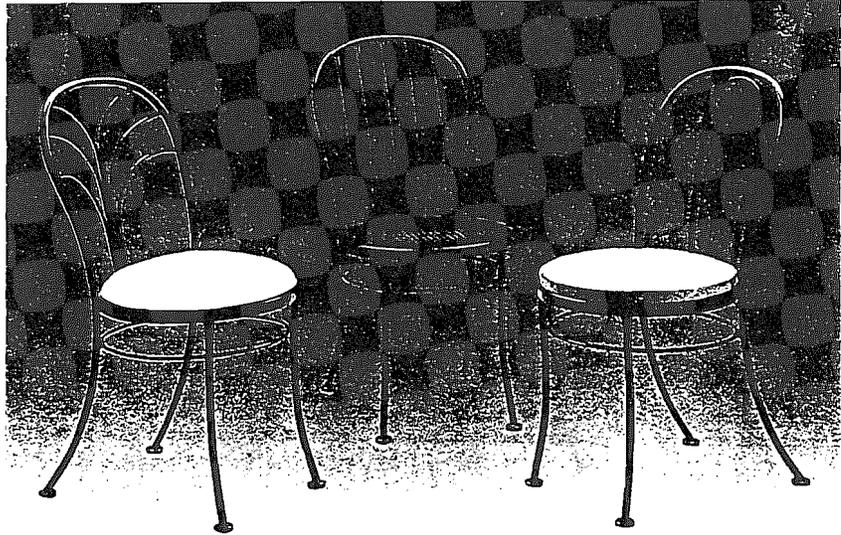
LFI/LANDSCAPE FORMS
431 Lawndale Avenue
Kalamazoo, MI 49001
(800) 521-2546
(616) 381-0396



Plaza Chair

Wesnic Food Court Furniture, Bentwood III side chairs, with mesh seat and Fan Back, model #302 (or equal). Install per manufacturer's specifications. Available through:

WESNIC
6000 Bowendale Avenue
Jacksonville, FL 32216
(800)874-8558
(619)434-8255



Chairs

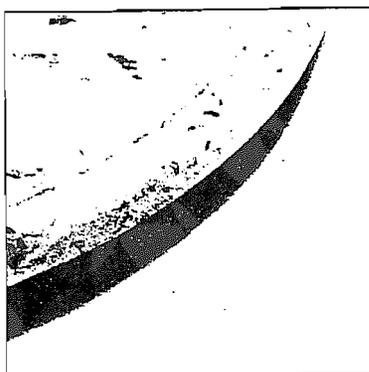
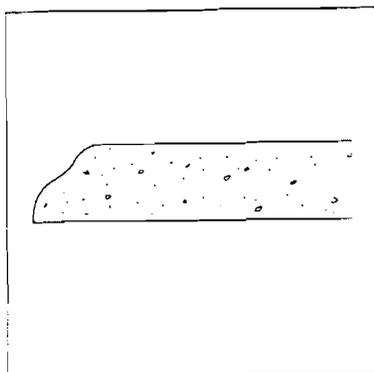
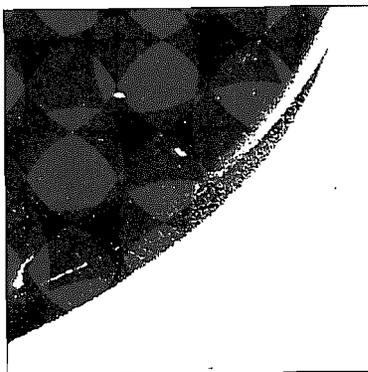
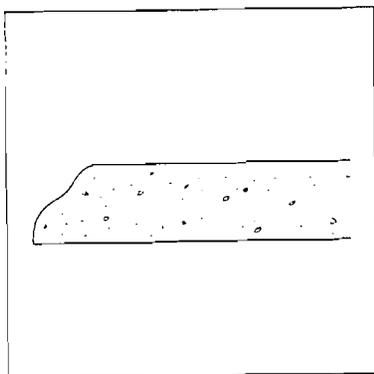


Prado Plaza Table



Falcon Table Base model #2704-UH (or equal) with cast iron base, 18 ga. 4" steel tubing, rubber cushionglides, 15" cast iron spider, 24" diameter base spread, 27.5 overall height. 36" round marble table top available through distributor. California Umbrella with 1-1/4" diameter pole available through Sunstar Bistro. Install per manufacturer's specifications. Available through:

FALCON PRODUCTS, INC.
9387 Dielman Industrial Drive
St. Louis, MO 63132
(314) 991-9200

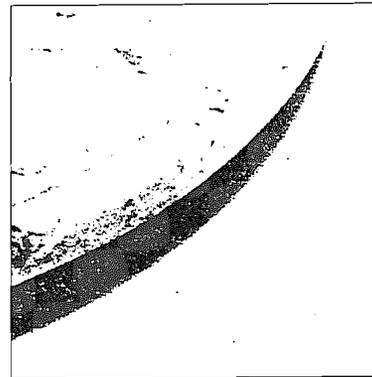
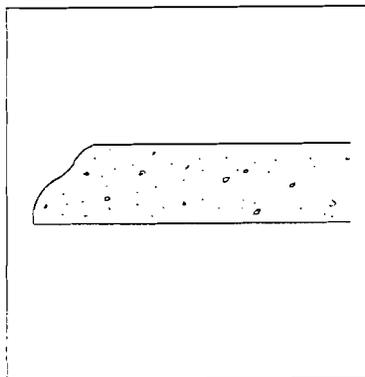
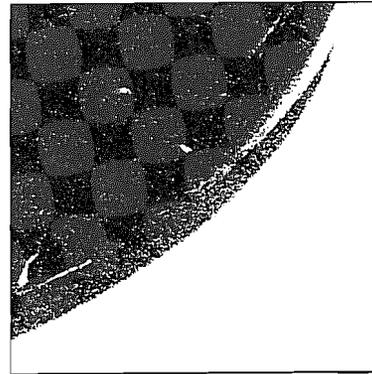
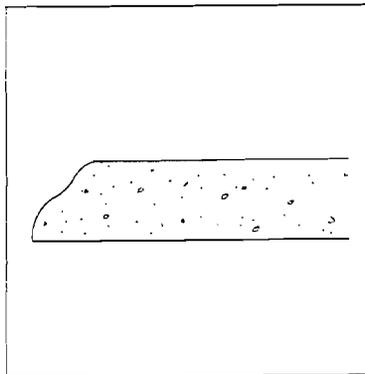
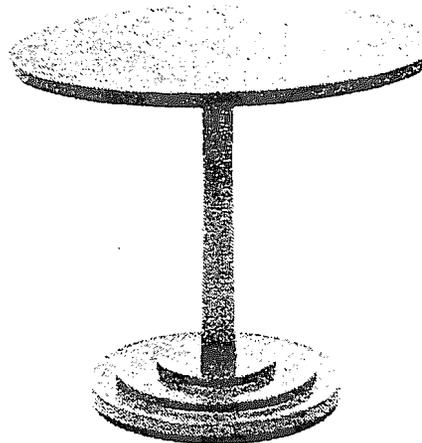


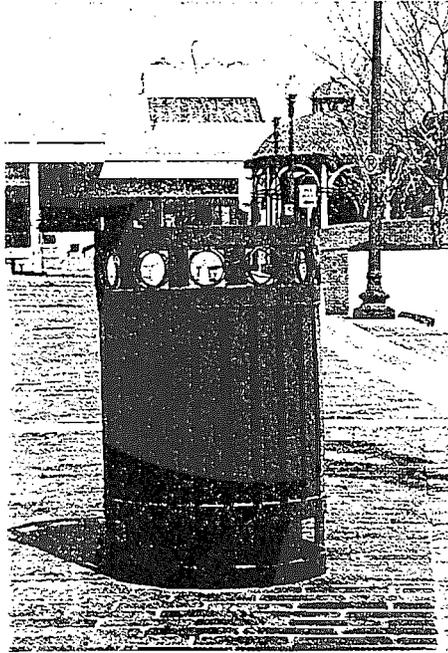


Palisades Plaza Table

Falcon Table Base model #4404-UH (or equal) with cast iron base, 18 ga. 3" steel tubing, rubber cushion glides, 15" cast iron spider, 22" diameter base spread, 28.5" overall height. 36" round marble table top available through distributor. California Umbrella with 1-1/4" diameter pole available through Sundtar Bistro.. Install per manufacturer's specifications. Available through:

FALCON PRODUCTS, INC.
9387 Dielman Industrial Drive
St. Louis, MO 63132
(314)991-9200

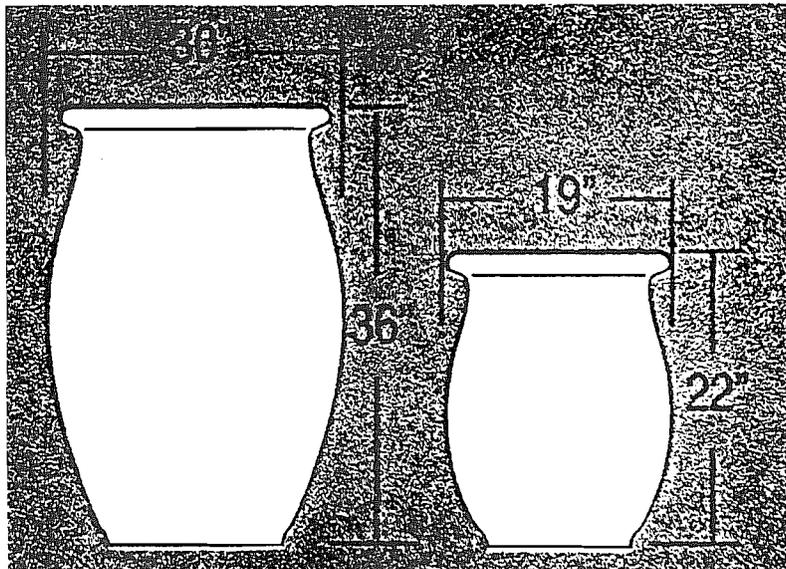




Prado Metal Trash Receptacles

Victor Stanley Ironsites Concourse Series, model #RS-12 (or equal). Color to match light standards. Install per manufacturer's specifications. Available through:

VICTOR STANLEY, INC.
Brick House Road
Dunkirk, MD 20754
(301) 855-8300



Prado Concrete Trash Receptacle

Dura Art Stone cast stone trash receptacle model number TR-N round, nordic cream color with light sand blast finish, order number: S-TR-N-S-13-LSB (or equal) with 30" diameter, 36" height. Matching ash urn (at building entries only) order number: S-AU-N-S-13-LSB (or equal) with 19" diameter, 22" height. Install per manufacturer's specifications. Available through:

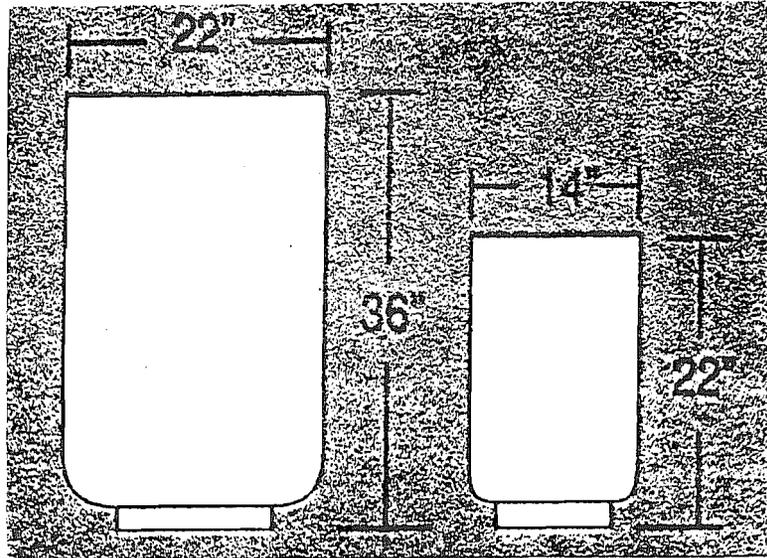
DURA ART STONE
11010 Live Oak
Fontana, CA 92335
(800) 821-1120
(714) 350-9000



Park Concrete Trash Receptacle

Dura Art Stone cast stone trash receptacle, D-round, nordiccream color with light sand blast finish, order number: S-TR-D-S-13-LSD (or equal) with 22" diameter, 36" height. Matching Ash Urn (at building entries only) order number: S-AU-D-S-13-LSB (or equal) with 14" diameter, 22" height. Install per manufacturer's specifications. Available through:

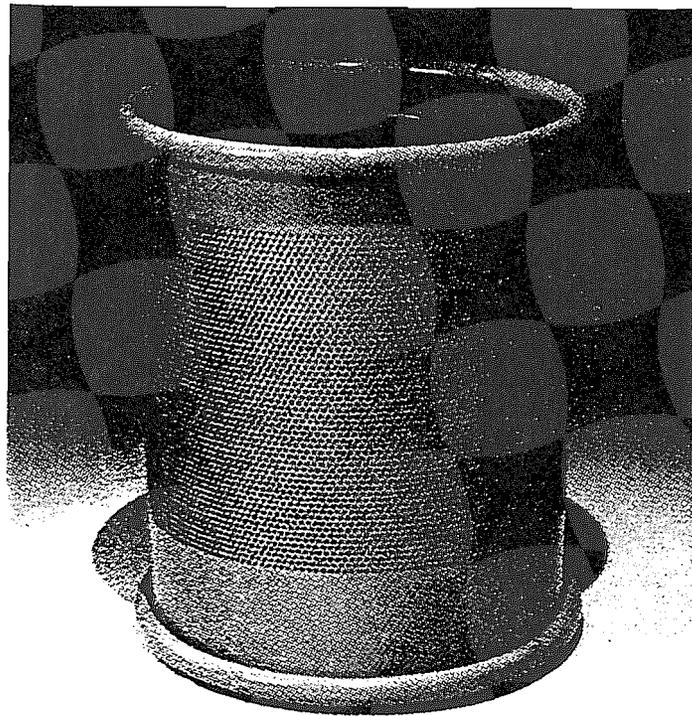
DURA ART STONE
11010 Live Oak
Fontana, CA 92335
(800) 821-1120
(714) 350-9000



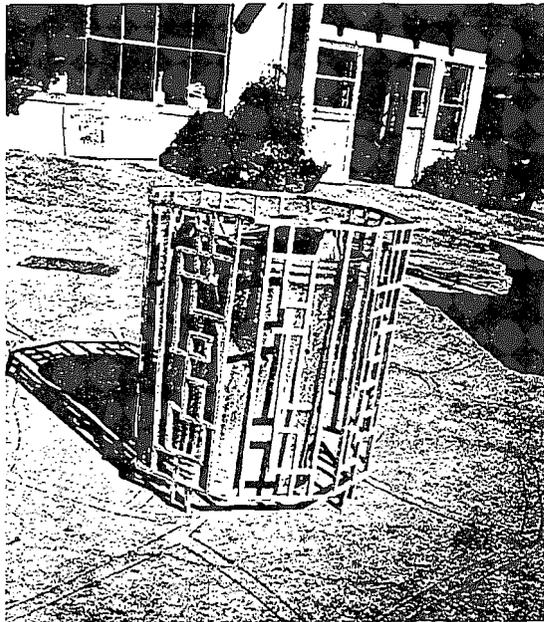
Palisades Trash Receptacle

Woodcrafters of Florida, Inc.; Heavy Metal Collection trash receptacle model #HTC-2631 (or equal) with 26" diameter, 31" height, 110 lb. weight, color D-70. Lid with lift and swing mechanism and locking device. Install per manufacturer's specifications. Available through:

WESNIC
6000 Bowendale Avenue
Jacksonville, FL 32216
(800) 874-8558
(619) 434-8255



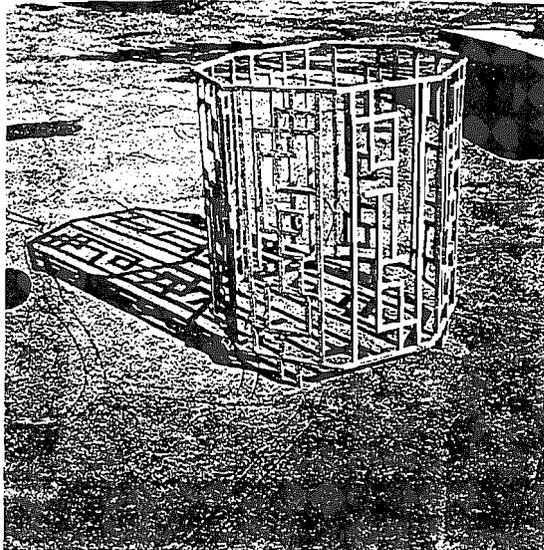
Trash Receptacle



Spanish Village Trash Receptacle

SueMar Designs trash can containers. Round, hexagonal, and octagonal shapes, design and colors at discretion of artist, 18" chain with eye bolt and concrete anchor. Install per manufacturer's specifications. Available through:

Susan M. Fleming
SUEMAR DESIGNS
Studio 28
Spanish Village, Balboa Park
San Diego, CA 92101
(619) 595-0503



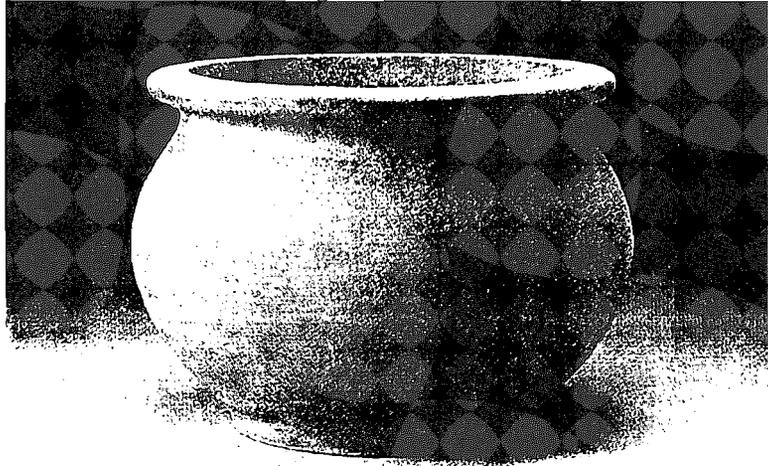


Plant Container

Dura Art Stone cast stone 3' & 4' wide, design N Aquarian round planters, 30" & 36" height, nordic cream color with light sand blast finish and 2" centered drain holes.

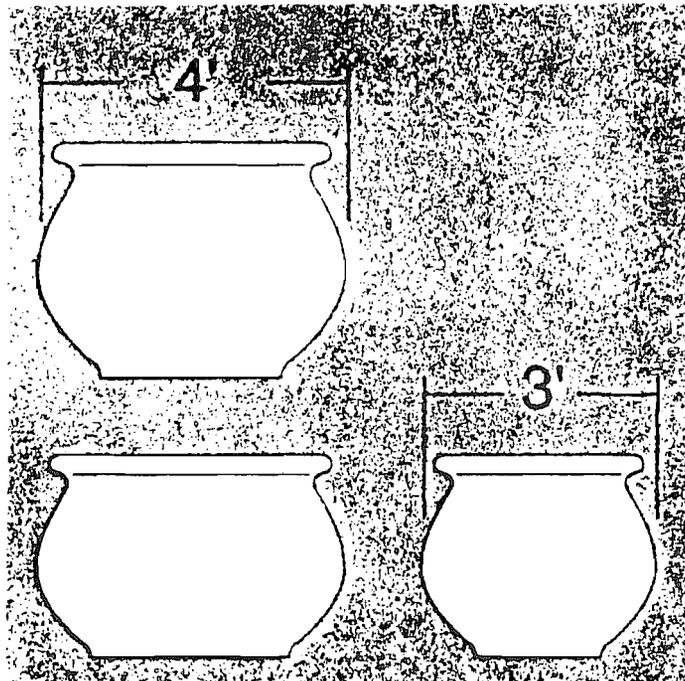
Order numbers:

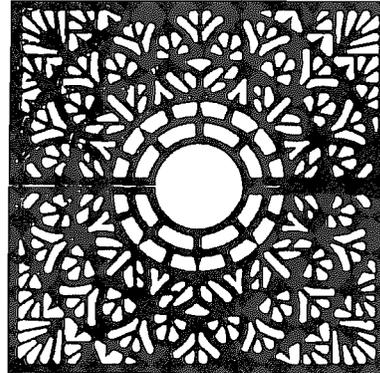
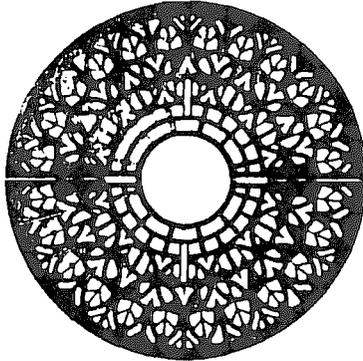
- S-4-N-36-S-13-LSB-2" centered (or equal)
- S-4-N-30-S-13-LSB-2" centered (or equal)
- S-3-N-30-S-13-LSB-2" centered (or equal)



Install per manufacturer's specifications. Available through:

DURA ART STONE
11010 Live Oak
Fontana, CA 92335
(800) 821-1120
(714) 350-9000

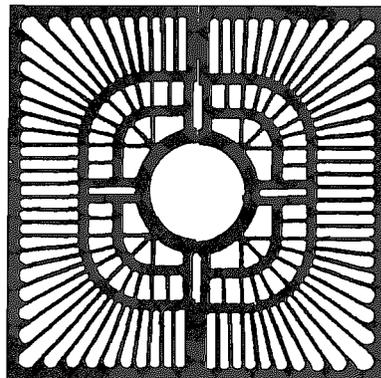
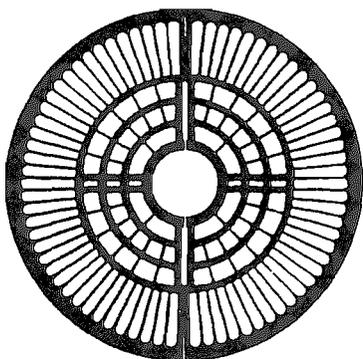




Prado Tree Grates

Urban Accessories, cast iron tree grate model "O.T." series (or equal). Round or square shape and size to be determined. Install per manufacturer's specifications. Available through:

URBAN ACCESSORIES
First Street & Avenue "A"
Snohomish, WA 98290
(206) 568-3143
(206) 568-8000



Palisades Tree Grate

Urban Accessories cast iron tree grate model "Standard Flats" (or equal). Round or square shape and size to be determined. Install per manufacturer's specifications. Available through:

URBAN ACCESSORIES
First Street & Avenue "A"
Snohomish, WA 98290
(206) 568-3143
(206) 568-8000

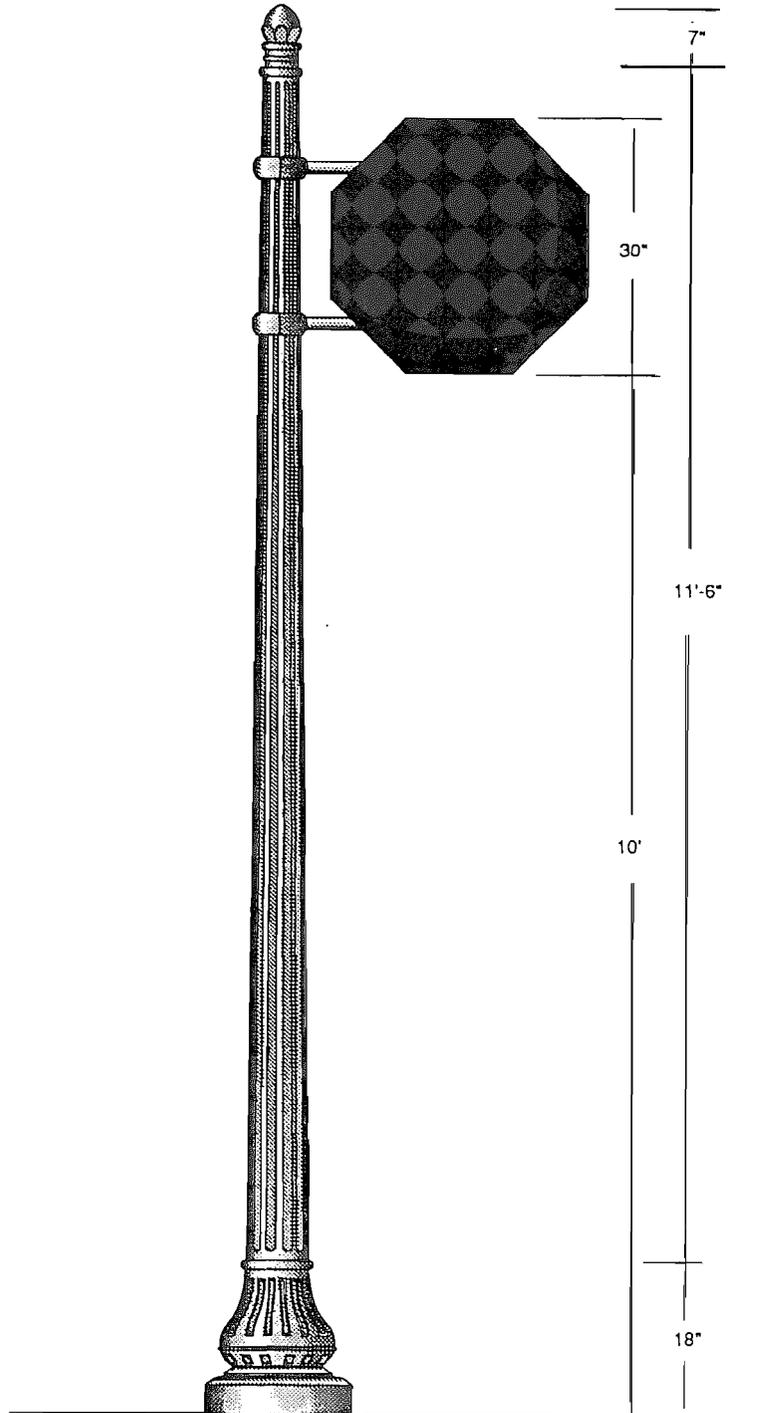


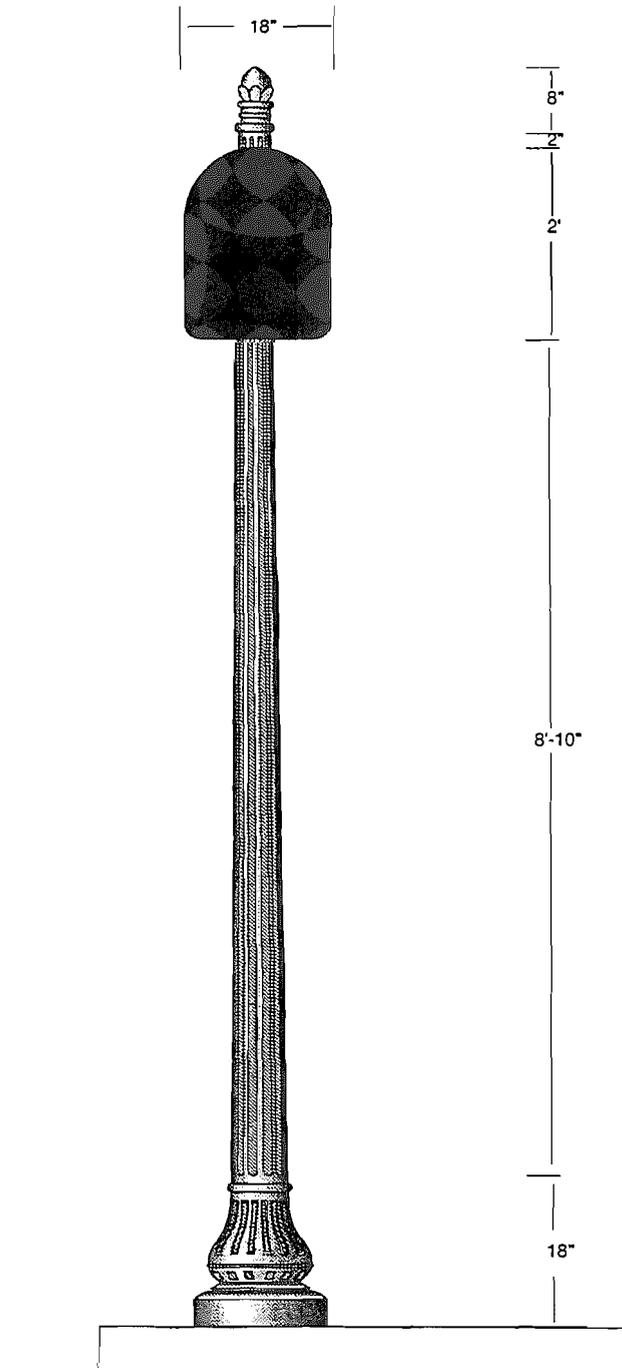
Stop Sign Standard

Western Lighting Standards Capistrano series as shown (or equal). Color shall be Frazee ShutterGreen 6125N, gloss enamel or equal. Install per manufacturer's specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499

PLEASE SEE
BALBOA PARK
SIGN MANUAL
UPDATE





Prado Tram Stop Sign Standard

Western Lighting Standards Capistrano series as shown (or equal). Color shall be Frazee ShutterGreen 6125N, gloss enamel or equal. Install per manufacturer's specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499

PLEASE SEE
BALBOA PARK
SIGN MANUAL
UPDATE

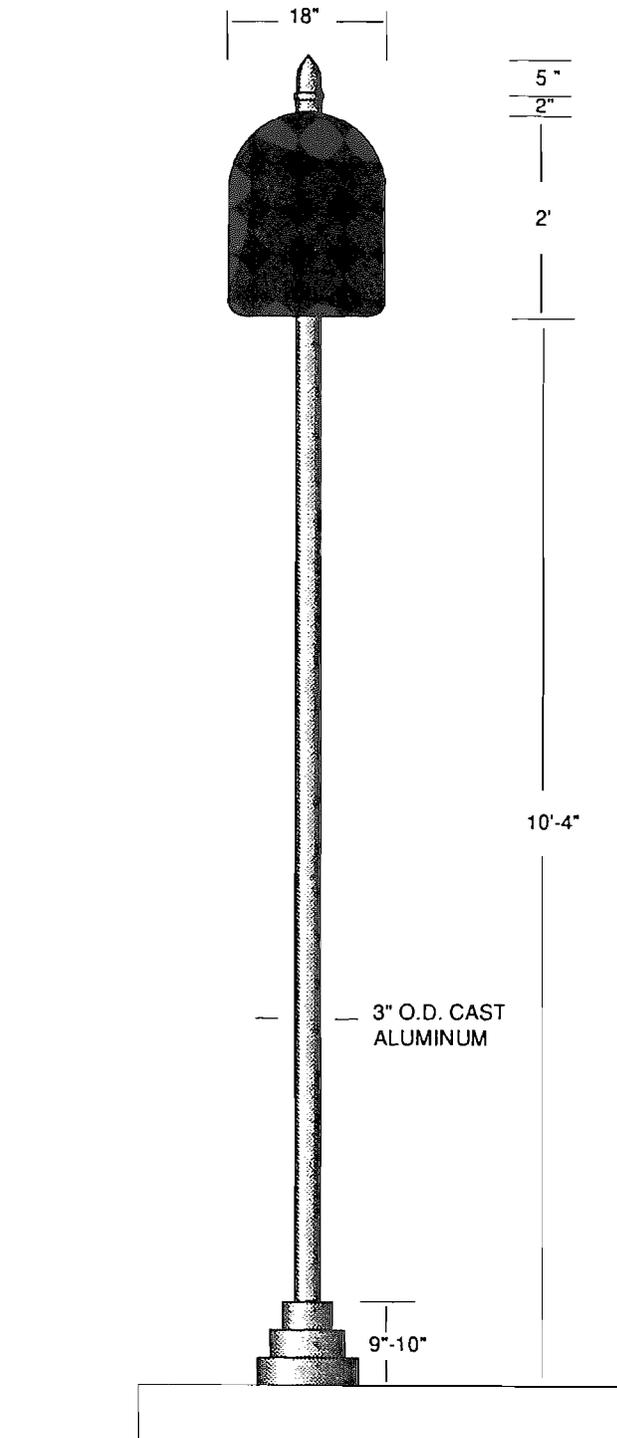


Palisades Tram Stop Sign Standard

Western Lighting Standards
custom design as shown (orequal).
Brushed aluminum finish. Install
per manufacturer's specifications.
Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499

PLEASE SEE
BALBOA PARK
SIGN MANUAL
UPDATE



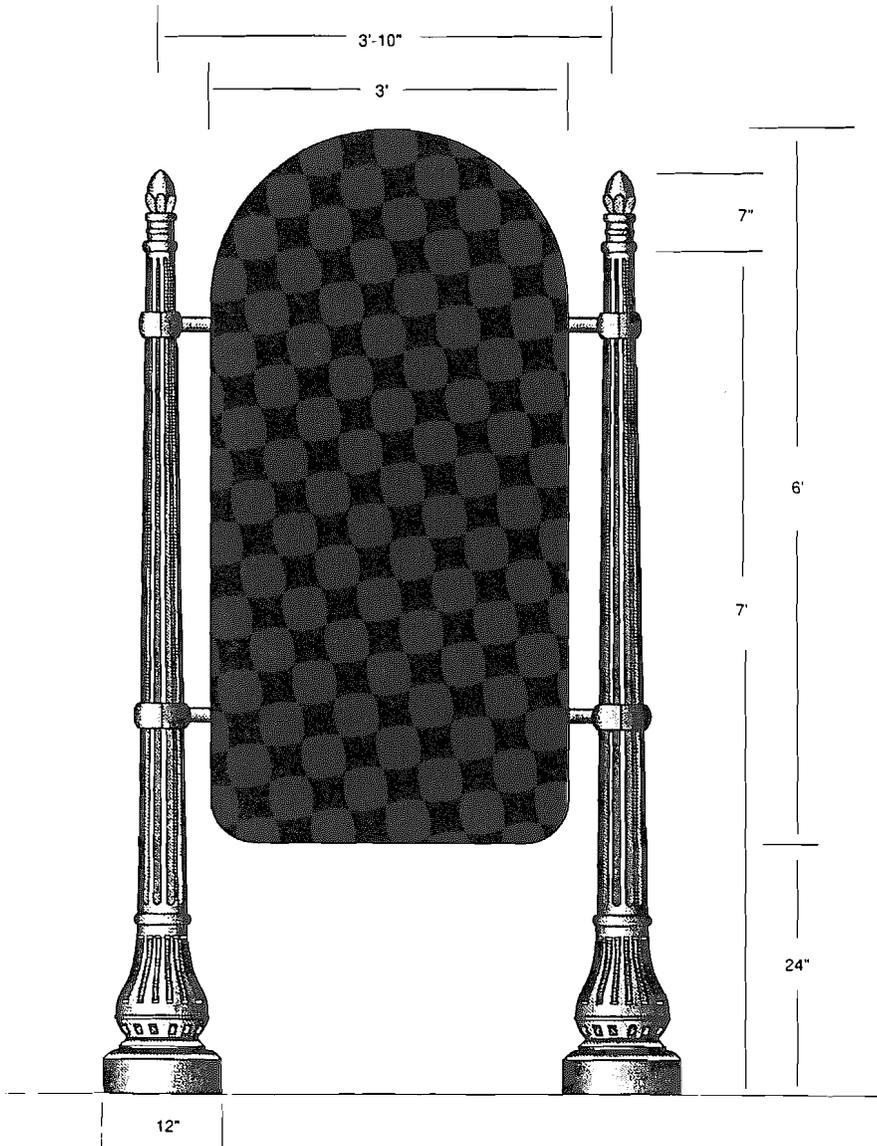


Prado Pedestrian Orientation Sign Standards

Western Lighting Standards Mini Capistrano series as shown (or equal). Color shall be Frazee Shutter Green 6125N gloss enamel or equal. Install per manufacturer's specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-5499

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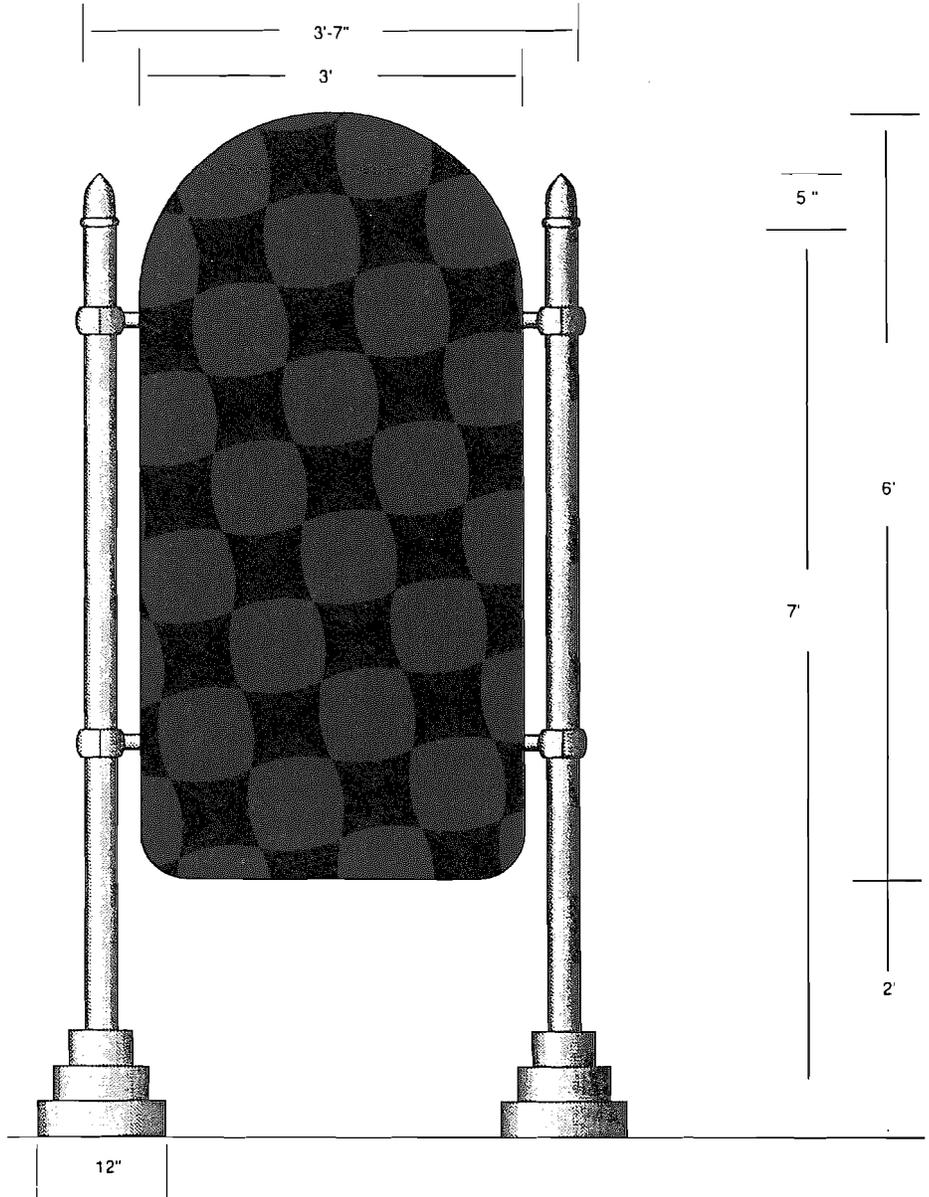


Palisades Pedestrian Orientation Sign Standards

Western Lighting Standards custom design as shown (orequal). Brushed aluminum finish. Install per manufacturer's specifications. Available through:

WESTERN LIGHTING STANDARDS
325 West Rider
Perris, CA 92370
(714) 657-549

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THE BALBOA PARK SIGN MANUAL HAS BEEN UPDATED. PLEASE SEE THE
BALBOA PARK SIGN MANUAL UPDATED ADOPTED SEPTEMBER 5, 2019.

Balboa Park Sign Manual

Historic Preservation Standards

U.S. Department
of the Interior
National Park Service

The Secretary of the Interior's
**Standards for
Rehabilitation**
and Guidelines for
Rehabilitating Historic Buildings

Note: The following document is the original version included in the Appendix of the Central Mesa Precise Plan. Please visit the National Park Service web site for current preservation standards at www.nps.gov

**The Secretary of the Interior's
Standards for Rehabilitation
and Guidelines for
Rehabilitating Historic Buildings (Revised 1983)**

U.S. Department of the interior
National Park Service
Preservation Assistance Division
Washington, D.C.

The "Secretary of the Interior's Standards for Historic Preservation Projects" were initially prepared in 1979 by W. Brown Morton III and Gary L. Hume. The updated and expanded Guidelines for Rehabilitating Historic Buildings that follow were developed by Gary L. Hume and Kay D. Weeks, Technical Preservation Services, Preservation Assistance Division, with the assistance of the professional and support staff.

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BUILDING INTERIOR

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THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

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

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

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

The Standards for Rehabilitation are as follows:

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

5. Distinctive stylistic features or examples of skilled craftsmanship which characterize a building, structure, or site shall be treated with sensitivity.
6. Deteriorated architectural features shall be repaired rather than replaced, wherever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical, or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures.
7. The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials shall not be undertaken.
8. Every reasonable effort shall be made to protect and preserve archeological resources affected by, or adjacent to **any** project.
9. Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations and additions do not destroy significant historical, architectural or cultural material, and such design is compatible with the size, scale, color, material, and character of the property, neighborhood or environment.
10. Wherever possible, new additions or alterations to structures shall be done **in** such a manner that if such additions or alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.

In the past several years, the most frequent use of the Secretary's "Standards for Rehabilitation" has been to determine if a rehabilitation project qualifies **as** a "certified rehabilitation" pursuant to the Tax Reform Act of 1976, the Revenue Act of 1978, and the Economic Recovery Tax Act of 1981, **as** amended. The Secretary is required by law to certify rehabilitations that are "**consistent** with the historic character of the structure or the district in which it is located." **The** Standards are used to **evaluate** whether the historic character of a building is preserved in the process of rehabilitation. Between 1976 and 1982 over 5,000 projects were reviewed and approved under the Preservation Tax Incentives program.

As stated in the definition, the treatment "Rehabilitation" **assumes** that at least some repair or alteration of the historic building will need to take place in order to provide for an efficient contemporary use; however these repairs and alterations must not damage or destroy the materials and features—including their finishes—that are important in defining the building's historic character.

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

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

GUIDELINES FOR REHABILITATING HISTORIC BUILDINGS

The Guidelines were initially developed in 1977 to help property owners, developers, and Federal managers apply the Secretary of the Interior's "Standards for Rehabilitation" during the project planning stage by providing general design and technical recommendations. Unlike the Standards, the Guidelines are not codified as program requirements. Together with the "Standards for Rehabilitation" they provide a model process for owners, developers, and federal agency managers to follow.

It should be noted at the outset that the Guidelines are intended to assist in applying the Standards to projects generally; consequently, they are not meant to give **case-specific** advice or address exceptions or rare instances. For example, they cannot tell an owner or developer which features of their own historic building are important in defining the historic character and must be preserved—although examples are provided in each section—or which features could be altered, if necessary, for the new use. This kind of careful case-by-case decisionmaking is best accomplished by seeking assistance from qualified historic preservation professionals in the planning stage of the project. Such professionals include architects, architectural historians, historians, archeologists, and others who are skilled in the preservation, rehabilitation, and restoration of historic properties.

The Guidelines pertain to historic buildings of **all** sizes, materials, occupancy, and construction types; and apply to interior and exterior work as well as new exterior additions. **Those** approaches, treatments, and techniques that are consistent with the Secretary of the Interior's "**Standards** for Rehabilitation" are listed in the "**Recommended**" column on the left; those approaches, treatments, and techniques which could adversely affect a building's historic character are listed in the "**Not Recommended**" column on the right.

To provide clear and consistent guidance for owners, developers, and federal agency managers to follow, the "Recommended" courses of action in each section are listed in order of historic preservation concerns so that a rehabilitation project may be successfully planned and completed--one that, first, assures the preservation of a **building's** important or "character-defining" architectural materials and features and, second, makes possible an efficient contemporary use. Rehabilitation guidance in each section **begins** with protection and maintenance, that work which should be maximized in every project to enhance overall preservation goals. Next, where some deterioration is present, repair of the building's historic materials and features is recommended. Finally, when deterioration is so extensive that repair is not possible, the most problematic area of work is considered: replacement of historic materials and features with new materials.

To further guide **the** owner and developer in planning a successful rehabilitation project, those complex design issues dealing with new use requirements such as alterations and additions are highlighted at the end of each section to underscore the need for particular sensitivity in these areas.

Identify, Retain, and Preserve

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

Protect and Maintain

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

Repair

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

Replace

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

entire feature in kind, that is, with the same material. Because this approach may not always be technically or economically feasible, provisions are made to consider the use of a compatible substitute material.

It should be noted that, while the National Park Service guidelines recommend the replacement of an entire character-defining feature under certain well-defined circumstances, they never recommend removal and replacement with new material of a feature that—although damaged or **deteriorated**—could reasonably be repaired and thus preserved.

Design for Missing Historic Features

When an entire interior or exterior feature is missing (for example, an entrance, or **cast** iron facade; or a principal staircase), it no longer plays a role in physically defining the historic character of the building unless it can be accurately recovered in form and detailing through the process of carefully documenting the historical appearance. Where an important architectural feature is missing, its recovery is always recommended in the guidelines **as** the first or preferred, course of action. Thus, if adequate historical, pictorial, and physical documentation exists so that the feature may be accurately reproduced, and if it is desirable to re-establish the feature as part of the building's historical appearance, then designing and constructing a new feature based on such information is appropriate. However, a second acceptable option for the replacement feature is a new design that is compatible with the remaining character-defining features of the historic building. The new design should always take into account the size, scale, and material of the historic building itself and, most importantly, should be clearly differentiated so that a false historical appearance is not created.

Alterations/Additions to Historic Buildings

Some exterior and interior alterations to the historic building are generally needed to assure its **continued** use, but it is most important that such alterations do not radically change, obscure, or destroy character-defining spaces, materials, features, or finishes. Alterations may include providing additional parking space on an existing historic building site; cutting new entrances or windows on secondary elevations; inserting an additional floor; installing an entirely new mechanical system; or creating an atrium or light well. Alterations may also include the selective removal of building or other features of the environment or building site that are intrusive and therefore detract from the overall historic character.

The construction of **an** exterior addition to a historic building may seem to be essential for the new use, but it is emphasized in the guidelines that such new additions should be avoided, if possible, and considered only after it is determined that those needs cannot be met by altering secondary, **i.e.**, non character-defining interior spaces. If, after a thorough evaluation of interior solutions, an exterior addition is still judged to be the only viable alternative, it should be designed **and** constructed to be clearly differentiated from the historic building and so that the character-defining features are not radically changed, obscured, damaged, or destroyed.

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

Health and Safety Code Requirements; Energy Retrofitting

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

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

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

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

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

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

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

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

BUILDING EXTERIOR

Masonry: Brick, stone, terra cotta, concrete, adobe, stucco and mortar

Masonry features (such as brick cornices and door pediments, stone window architraves, terra cotta brackets and railings) as well as masonry surfaces (modelling, tooling, bonding patterns, joint size, and color) may be important in defining the historic character of the building. It should be noted that while masonry is among the most durable of historic building materials, it is also the most susceptible to damage by improper maintenance or repair techniques and by harsh or abrasive cleaning methods. Most preservation guidance on masonry thus focuses on such concerns as cleaning and the process of repointing. For specific guidance on this subject, consult Preservation Briefs: 1, 2, 5, 4, and 7. (See Reading List and Ordering Information on pg. 58.)

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Identifying, retaining, and preserving masonry features that are important in defining the overall historic character of the building such as walls, brackets, railings, cornices, window architraves, door pediments, steps, and columns; and joint and unit size, tooling and bonding patterns, coatings, and color.

Protecting and maintaining masonry by providing proper drainage so that water does not stand on flat, horizontal surfaces or accumulate in curved decorative features*

Not Recommended

Removing or radically changing masonry features which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing or rebuilding a major portion of exterior masonry walls that could be repaired so that, as a result, the building is no longer historic and is essentially new construction.

Applying paint or other coatings such as stucco to masonry that has been historically unpainted or uncoated to create a new appearance.

Removing paint from historically painted masonry.

Radically changing the type of paint or coating or its color.

Failing to evaluate and treat the various causes of mortar joint deterioration such as leaking roofs or gutters, differential settlement of the building, capillary action, or extreme weather exposure.

Recommended

Cleaning masonry only when necessary to halt deterioration or remove heavy soiling.

Carrying out masonry surface cleaning tests after it has been determined that such cleaning is necessary. Tests should be observed over a sufficient period of time so that both the immediate effects and the long range effects are known to enable selection of the gentlest method possible.

Cleaning masonry surfaces with the gentlest method possible, such as low pressure water and detergents, using natural bristle brushes.

Inspecting painted masonry surfaces to determine whether repainting is necessary.

Removing damaged or deteriorated paint only to the next sound layer using the gentlest, method possible (e.g., handscraping) prior to repainting.

Applying compatible paint coating systems following proper surface preparation.

Repainting with colors that are historically appropriate to the building and district.

Not Recommended

Cleaning masonry surfaces when they are not heavily soiled to create a new appearance, thus needlessly introducing chemicals or moisture into historic materials.

Cleaning masonry surfaces without testing or without sufficient time for the testing results to be of value.

Sandblasting brick or stone surfaces using dry or wet grit or other abrasives. These methods of cleaning permanently erode the surface of the material and accelerate deterioration.

Using a cleaning method that involves water or liquid chemical solutions when there is any possibility of freezing temperatures.

Cleaning with chemical products that will damage masonry, such as using acid on limestone or marble, or leaving chemicals on masonry surfaces.

Applying high pressure water cleaning methods that will damage historic masonry and the mortar joints.

Removing paint that is firmly adhering to, and thus protecting, masonry surfaces.

Using methods of removing paint which are destructive to masonry, such as sandblasting, application of caustic solutions, or high pressure waterblasting.

Failing to follow manufacturers' product and application instructions when repainting masonry.

Using new paint colors that are inappropriate to the historic building and district.

Masonry (continued)

Recommended

Evaluating the overall condition of the masonry to determine whether more than protection and maintenance are required, that is, if repairs to the masonry features will be necessary.

Repairing masonry walls and other masonry features by repointing the mortar joints where there is evidence of deterioration such as disintegrating mortar, cracks in mortar joints, loose bricks, damp walls, or damaged plasterwork.

Removing deteriorated mortar by carefully hand-raking the joints to avoid damaging the masonry.

Duplicating old mortar in strength, composition, color, and texture.

Duplicating old mortar joints in width and in joint profile.

Repairing stucco by removing the damaged material and patching with new stucco that duplicates the old in strength, composition, color, and texture.

Using mud plaster as a surface coating over unfired, unstabilized adobe because the mud plaster will bond to the adobe.

Not Recommended

Failing to undertake adequate measures to assure the preservation of masonry features.

Removing nondeteriorated mortar from sound joints, then repointing the entire building to achieve a uniform appearance.

Using electric saws and hammers rather than hand tools to remove deteriorated mortar from joints prior to **repointing**.

Repointing with mortar of high **portland** cement content (unless it is the content of the historic mortar). This can often create a bond that is stronger than the historic material and can cause damage as a result of the differing coefficient of expansion and the differing porosity of the material and the mortar.

Repointing with a synthetic caulking compound.

Using a "scrub" coating technique to **repoint** instead of traditional repointing methods.

Changing the width or joint profile when **repointing**.

Removing sound stucco; or repairing with new stucco that is stronger than the historic material or does not convey the same visual appearance.

Applying cement stucco to unfired, unstabilized adobe. Because the cement stucco will not bond properly, moisture can become entrapped between materials, resulting in accelerated deterioration of the adobe.

Recommended

Repairing masonry features by patching, piecing-in, or consolidating the masonry using recognized preservation methods. Repair may also include the limited replacement in kind--or with compatible substitute material--of those extensively deteriorated or missing parts of masonry features when there are surviving prototypes such as terra-cotta brackets or stone balusters.

Applying new or non-historic surface treatments such as water-repellent coatings to masonry only after repointing and only if masonry repairs have failed to arrest water penetration problems.

Replacing in kind an entire masonry feature that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. Examples can include large sections of a wall, a cornice, balustrade, column, or stairway. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and installing a new masonry feature such as steps or a door pediment when the historic feature is completely missing. It may be an accurate restoration using historical, pictorial, and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the historic building.

Not Recommended

Replacing an entire masonry feature such as a cornice or balustrade when repair of the masonry and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the masonry feature or that is physically or chemically incompatible.

Applying waterproof, water-repellent, or non-historic coatings such as stucco to masonry as a substitute for repointing and masonry repairs. Coatings are frequently unnecessary, expensive, and may change the appearance of historic masonry as well as accelerate its deterioration.

Removing a masonry feature that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Creating a false historical appearance because the replaced masonry feature is based on insufficient historical, pictorial, and physical documentation.

Introducing a new masonry feature that is incompatible in size, scale, material and color.

Wood: Clapboard, weatherboard, shingles, and other wooden siding and decorative elements

Because it can be easily shaped by sawing, planing, carving, and gouging, wood is the most commonly used material for architectural features such as clapboards, cornices, brackets, entablatures, shutters, columns and balustrades. These wooden features--both functional and decorative--may be important in defining the historic character of the building and thus their retention, protection, and repair are of particular importance in rehabilitation projects. For specific guidance, consult Preservation Briefs: 9, 10, and "Epoxy for Wood Repair in Historic Buildings." (See Reading List and Ordering Information on pg. 58.)

Recommended

Identifying, **retaining, and preserving** wood features that are important in defining the overall historic character of the building such as siding, cornices, brackets, window architraves, and doorway pediments; and their paints, finishes, and colors.

Protecting and maintaining wood features by providing proper drainage so that water is not allowed to stand on flat, horizontal surfaces or accumulate in decorative features.

Not Recommended

Removing or radically changing wood features which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Removing a major portion of the historic wood from a facade instead of repairing or replacing only the deteriorated wood, then reconstructing the facade with new material in order to achieve a uniform or "improved" appearance.

Radically changing the type of finish or its color or accent scheme so that the historic character of the exterior is diminished.

Stripping historically painted surfaces to bare wood, then applying clear finishes or stains in order to create a "natural look."

Stripping paint or varnish to bare wood rather than repairing or reapplying a special finish, **i.e.**, a grained finish to an exterior wood feature such as a front door.

Failing to identify, evaluate, and treat the causes of wood deterioration, including faulty flashing, leaking gutters, cracks and holes in siding, deteriorated caulking in joints and seams, plant material growing too close to wood surfaces, or insect or fungus infestation.

Wood (continued)

Recommended

Applying chemical preservatives to wood features such as beam ends or outriggers that are exposed to decay hazards and are traditionally unpainted.

Retaining coatings such as paint that help protect the wood from moisture and ultraviolet light. Paint removal should be considered only where there is paint surface deterioration and as part of an overall maintenance program which involves repainting or applying other appropriate protective coatings.

Inspecting painted wood surfaces to determine whether repainting is necessary or if cleaning is all that is required.

Removing damaged or deteriorated paint to the next sound layer using the gentlest method possible (handscraping and handsanding), then repainting.

Using with care electric hot-air guns on decorative wood features and electric heat plates on flat wood surfaces when paint is so deteriorated that total removal is necessary prior to repainting.

Using chemical strippers primarily to supplement other methods such as handscraping, handsanding and the above-recommended thermal devices. Detachable wooden elements such as shutters, doors, and columns may--with the proper safeguards--be chemically dip-stripped.

Applying compatible paint coating systems following proper surface preparation.

Repainting with colors that are appropriate to the historic building and district.

Evaluating the overall condition of the wood to determine whether more than protection and maintenance are required, that is, if repairs to wood features will be necessary.

Not Recommended

Using chemical preservatives such as creosote which can change the appearance of wood features unless they were used historically.

Stripping paint or other coatings to reveal bare wood, thus exposing historically coated surface's to the effects of accelerated weathering.

Removing paint that is firmly adhering to, and thus, protecting wood surfaces.

Using destructive paint removal methods such as a propane or butane torches, sandblasting or waterblasting. These methods can irreversibly damage historic woodwork.

Using thermal devices improperly so that the historic woodwork is scorched.

Failing to neutralize the wood thoroughly after using chemicals so that new paint does not adhere.

Allowing detachable wood features to soak too long in a caustic solution so that the wood grain is raised and the surface roughened.

Failing to follow manufacturers' product and application instructions when repainting exterior woodwork.

Using new colors that are inappropriate to the historic building or district.

Failing to undertake adequate measures to assure the preservation of wood features.

Recommended

Repairing wood features by patching, piecing-in, consolidating, or otherwise reinforcing the wood using recognized preservation methods. Repair may also include the limited replacement in kind-- or with compatible substitute material-- of those extensively deteriorated or missing parts of features where there are surviving prototypes such as brackets, moldings, or sections of siding.

Replacing in kind an entire wood feature, that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. Examples of wood features include a cornice, entablature or balustrade. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted because it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and installing a new wood feature such as a cornice or doorway when the historic feature is completely missing. It may be an accurate restoration using historical, pictorial, and physical documentation, or be a new design that is compatible with the size, scale, material, and color of the historic building.

Not Recommended

Replacing an entire wood feature such as a cornice or wall when repair of the wood and limited replacement of deteriorated or missing parts are appropriate.

Using substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the wood feature or that is physically or chemically incompatible.

Removing an entire wood feature that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Creating a false historic appearance because the replaced wood feature is based on insufficient historical, pictorial, and physical documentation.

Introducing a new wood feature that is incompatible in size, scale, material, and color.

Architectural Metals: Cast iron, steel, pressed tin, copper, aluminum, and zinc

Architectural metal features--such as cast-iron facades, porches, and steps; sheet metal cornices, roofs, roof cresting and storefronts; and cast or rolled metal doors, window sash, entablatures, and hardware--are often highly decorative and may be important in defining the overall historic character of the building. Their retention, protection, and repair should be a prime consideration in rehabilitation projects. For specific guidance, consult "Metals in America's Historic Buildings." (See Reading List and Ordering Information on pg. 58.)

Recommended

Identifying, retaining, and preserving architectural metal features such as columns, capitals, window hoods, or stairways that are important in defining the overall historic character of the building; and their finishes and colors.

Protecting and maintaining architectural metals from corrosion by providing proper drainage so that water does not stand on flat, horizontal surfaces or accumulate in curved, decorative features.

Cleaning architectural metals, when necessary, to remove corrosion prior to repainting or applying other appropriate protective coatings.

Not Recommended

Removing or radically changing architectural metal features which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Removing a major portion of the historic architectural metal from a facade instead of repairing or replacing only the deteriorated metal, then reconstructing the facade with new material in order to create a uniform, or "improved" appearance.

Radically changing the type of finish or its historic color or accent scheme.

Failing to identify, evaluate, and treat the causes of corrosion, such as moisture from leaking roofs or gutters.

Placing incompatible metals together without providing a reliable separation material. Such incompatibility can result in galvanic corrosion of the less noble metal, e.g., copper will corrode cast iron, steel, tin, and aluminum.

Exposing metals which were intended to be protected from the environment.

Applying paint or other coatings to metals such as copper, bronze, or stainless steel that were meant to be exposed.

Recommended

Identifying the particular type of metal prior to any cleaning procedure and then testing to assure that the gentlest cleaning method possible is selected or determining that cleaning is inappropriate for the particular metal.

Cleaning soft metals such as lead, tin, copper, terneplate, and zinc with appropriate chemical methods because their finishes can be easily abraded by blasting methods.

Using the gentlest cleaning methods for cast iron, wrought iron, and steel--hard metals--in order to remove paint buildup and corrosion. If handscraping and wire brushing have proven ineffective, low pressure dry grit blasting may be used as long as it does not abrade or damage the surface.

Applying appropriate paint or other coating systems after cleaning in order to decrease the corrosion rate of metals or alloys.

Repainting- with colors that are appropriate to the historic building or district.

Applying an appropriate protective coating such as lacquer to an architectural metal feature such as a bronze door which is subject to heavy pedestrian use.

Evaluating the overall condition of the architectural metals to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Not Recommended

Using cleaning methods which alter or damage the historic color, texture, and finish of the metal; or cleaning when it is inappropriate for the metal.

Removing the patina of historic metal. The patina may be a protective coating on some metals, such as bronze or copper, as well as a significant historic finish.

Cleaning soft metals such as lead, tin, copper, terneplate, and zinc with grit blasting which will abrade the surface of the metal.

Failing to employ gentler methods prior to abrasively cleaning cast iron, wrought iron or steel; or using high pressure grit blasting.

Failing to re-apply protective coating systems to metals or alloys that require them after cleaning so that accelerated corrosion occurs.

Using new colors that are inappropriate to the historic building or district.

Failing to assess pedestrian use or new access patterns so that architectural metal features are subject to damage by use or inappropriate maintenance such as salting adjacent sidewalks.

Failing to undertake adequate measures to assure the preservation of architectural metal features.

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Not Recommended

Repairing architectural metal features by patching, splicing, or otherwise reinforcing the metal following recognized preservation methods. Repairs may also include the limited replacement in kind--or with a compatible substitute material--of those extensively deteriorated or missing parts of features when there are surviving prototypes such as porch balusters, column capitals or bases; or porch cresting.

Replacing in kind an entire architectural metal feature that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. Examples could include cast iron porch steps or steel sash windows. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and installing a new architectural metal feature such as a sheet metal cornice or cast iron capital when the historic feature is completely missing. It may be an accurate restoration using historical, pictorial, and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the historic building.

Replacing an entire architectural metal feature such as a column or a **balustrade** when repair of the metal and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the **visual** appearance of the **surviving** parts of the architectural metal feature or is that physically or chemically incompatible.

Removing an architectural **metal** feature that is unrepairable and not replacing **it**; or replacing it with a new **architectural** metal feature that does not convey the same visual appearance.

Creating a false historic appearance because the replaced **architectural** metal feature is based on insufficient historical, pictorial, and physical documentation.

Introducing a new architectural **metal** feature that is incompatible in size, scale, material, and color.

Roofs

The roof--with its shape; features such as cresting, dormers, cupolas, and chimneys; and the size, color, and patterning of the roofing material--can be extremely important in defining the building's overall historic character. In addition to the design role it plays, a weathertight roof is essential to the preservation of the entire structure; thus, protecting and repairing the roof as a "cover" is a critical aspect of every rehabilitation project. For specific guidance on roofs and roofing material, consult Preservation Briefs: 4. (See Reading List and Ordering Information on pg. 58.)

Recommended

Identifying, retaining, and preserving roofs--and their functional and decorative features--that are important in defining the overall historic character of the building. This includes the roof's shape, such as hipped, gambrel, and mansard; decorative features such as cupolas, cresting, chimneys, and weathervanes; and roofing material such as slate, wood, clay tile, and metal, as well as its size, color, and patterning.

Protecting and maintaining a roof by cleaning the gutters and downspouts and replacing deteriorated flashing. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration; and to insure that materials are free from insect infestation.

Providing adequate anchorage for roofing material to guard against wind damage and moisture penetration.

Not Recommended

Radically changing, damaging, or destroying roofs which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Removing a major portion of the roof or roofing material that is repairable, then reconstructing it with new material in order to create a uniform, or "improved" appearance.

Changing the configuration of a roof by adding new features such as dormer windows, vents, or skylights so that the historic character is diminished.

Stripping the roof of sound historic material such as slate, clay tile, wood, and architectural metal.

Applying paint or other coatings to roofing material which has been historically uncoated.

Failing to clean and maintain gutters and downspouts properly so that water and debris collect and cause damage to roof fasteners, sheathing, and the underlying structure.

Allowing roof fasteners, such as nails and clips to corrode so that roofing material is subject to accelerated deterioration.

RecommendedNot Recommended

Protecting a leaking roof with plywood and building paper until it can be properly repaired.

Permitting a leaking roof to remain unprotected so that accelerated deterioration of historic building materials--masonry, wood, plaster, paint and structural members--occurs.

Repairing a roof by reinforcing the historic materials which comprise roof features. Repairs will also generally include the limited replacement in kind--or with compatible substitute material--of those extensively deteriorated or missing parts of features when there are surviving prototypes such as cupola louvers, dentils, dormer roofing; or slates, tiles, or wood shingles on a main roof.

Replacing an entire roof feature such as a cupola or dormer when repair of the historic materials and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the **surviving** parts of the roof or that is physically or chemically incompatible.

Replacing in kind an entire feature of the roof that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. Examples can include a large section of roofing, or a dormer or chimney. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

Removing a feature of the roof that is unrepairable, such as a chimney or dormer, and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and constructing a new feature when the historic feature is completely missing, such as a chimney or cupola. It may be an accurate restoration using historical, pictorial and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the historic building.

Creating a false historical appearance because the replaced feature is based on insufficient historical, pictorial, and physical documentation.

Introducing a new roof feature that is, incompatible in size, scale, material, and color.

Roof (continued)

Recommended

Not Recommended

Alterations/Additions for the New Use

Installing mechanical and service equipment on the roof such as air conditioning, transformers, or solar collectors when required for the new use so that they are inconspicuous from the public right-of-way and do not damage or obscure character-defining features.

Designing additions to roofs such as residential, office, or storage spaces; elevator housing; decks and terraces; or dormers or skylights when required by the new use so that they are inconspicuous from the public right-of-way and do not damage or obscure character-defining features.

Installing mechanical or service equipment so that it damages or obscures character-defining features; or is conspicuous from the public right-of-way.

Radically changing a character-defining roof shape or damaging or destroying character-defining roofing material as a result of incompatible design or improper installation techniques.

Windows

A highly decorative window with an unusual shape, or glazing pattern, or color is most likely identified immediately as a character-defining feature of the building. It is far more difficult, however, to assess the importance of repeated windows on a facade, particularly if they are individually simple in design and material, such as the large, multi-paned sash of many industrial buildings. Because rehabilitation projects frequently include proposals to replace window sash or even entire windows to improve thermal efficiency or to create a new appearance, it is essential that their contribution to the overall historic character of the building be assessed together with their physical condition before specific repair or replacement work is undertaken. See also Energy Retrofitting. Preservation Briefs: 9 should be consulted for specific guidance on wooden window repair. (See Reading List and Ordering Information on pg. 58.)

Recommended

Identifying, retaining, and preserving windows--and their functional and decorative features--that are important in defining the overall historic character of the building. Such features can include frames, sash, muntins, glazing, sills, heads, hoodmolds, panelled or decorated jambs and moldings, and interior and exterior shutters and blinds.

Protecting and maintaining the wood and architectural metal which comprise the window frame, sash, muntins, and surrounds through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Not Recommended

Removing or radically changing windows which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Changing the number, location, size or glazing pattern of windows, through cutting new openings, blocking-in windows, and installing replacement sash which does not fit the historic window opening.

Changing the historic appearance of windows through the use of inappropriate designs, materials, finishes, or colors which radically change the sash, depth of reveal, and muntin configuration; the reflectivity and color of the glazing; or the appearance of the frame.

Obscuring historic window trim with metal or other material.

Stripping windows of historic material such as wood, iron, cast iron, and bronze.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of the windows results.

Recommended

Making windows weathertight by re-caulking and replacing or installing weatherstripping. These actions also improve thermal efficiency.

Evaluating the overall condition of materials to determine whether more than protection and maintenance are required, *i.e.* if repairs to windows and window features will be required.

Repairing window frames and sash by patching, splicing, consolidating or otherwise reinforcing. Such repair may also include replacement in kind of those parts that are either extensively deteriorated or are missing when there are surviving prototypes such as architraves, hoodmolds, sash, sills, and interior or exterior shutters and blinds.

Replacing in kind an entire window that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and installing new windows when the historic windows (frame, sash and glazing) are completely missing. The replacement windows may be an accurate restoration using historical, pictorial, and physical documentation; or be a new design that is compatible with the window openings and the historic character of the building.

Not Recommended

Retrofitting or replacing windows rather than maintaining the sash; frame, and glazing.

Failing to undertake adequate measures to assure the preservation of historic windows.

Replacing an entire window when repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Failing to reuse serviceable window hardware such as brass lifts and sash locks.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the window or that is physically or chemically incompatible.

Removing a character-defining window that is unrepairable and blocking it in; or replacing it with a new window that does not convey the same visual appearance.

Creating a false historical appearance because the replaced window is based on insufficient historical, pictorial, and physical documentation.

Introducing a new design that is incompatible with the historic character of the building.

RecommendedNot Recommended**Alterations/Additions for the New Use**

Designing and installing additional windows on rear or other non character-defining elevations if required by the new use. New window openings may also be cut into exposed party walls. Such design should be compatible with the overall design of the building, but not duplicate the fenestration pattern and detailing of a character-defining elevation.

Providing a setback in the design of dropped ceilings when they are required for the new use to allow for the full height of the window openings;

Installing new windows, including frames, sash, and muntin configuration that are incompatible with the building's historic appearance or obscure, damage, or destroy character-defining features.

Inserting new floors or furred-down ceilings which cut across the glazed areas of windows so that the exterior form and appearance of the windows are changed.

Entrances and Porches

Entrances and porches are quite often the focus of historic buildings, particularly when they occur on primary elevations. Together with their functional and decorative features such as doors, steps, balustrades, pilasters, and entablatures, they can be extremely important in defining the overall historic character of a building. Their retention, protection, and repair should always be carefully considered when planning rehabilitation work.

Recommended

Identifying, retaining, and preserving entrances--and their functional and decorative features--that are important in defining the overall historic character of the building such as doors, fanlights, sidelights, pilasters, entablatures, columns, balustrades, and stairs.

Protecting and maintaining the masonry, wood, and architectural metal that comprise entrances and porches through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Evaluating the overall condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to entrance and porch features will be necessary.

Not Recommended

Removing or radically changing entrances and porches which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Stripping entrances and porches of historic material such as wood, iron, cast iron, terra cotta, tile and brick.

Removing an entrance or porch because the building has been re-oriented to accommodate a new use.

Cutting new entrances on a primary elevation.

Altering utilitarian or service entrances so they appear to be formal entrances by adding panelled doors, fanlights, and sidelights.

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of entrances and porches results.

Failing to undertake adequate measures to assure the preservation of historic entrances and porches.

RecommendedNot Recommended

Repairing entrances and porches by reinforcing the historic materials. Repair will also generally include the limited replacement in kind--or with compatible substitute material--of those extensively deteriorated or missing parts of repeated features where there are surviving prototypes such as balustrades, cornices, entablatures, columns, sidelights, and stairs.

Replacing in kind an entire entrance or porch that is too deteriorated to repair--if the form and detailing are still evident--using the physical evidence to guide the new work. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

Replacing an entire entrance or porch when the repair of materials and limited replacement of parts are appropriate.

Using a substitute material for the replacement parts that does not convey the visual appearance of the surviving parts of the entrance and porch or that is physically or **chemically** incompatible.

Removing an entrance or porch that is unrepairable and not replacing it; or replacing it with a new entrance or porch that does not convey the same visual appearance.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and constructing a new entrance or porch if the historic entrance or porch is completely missing. It may be a restoration based on historical, pictorial, and physical documentation; or be a new design that is compatible with the historic character of the building.

Creating a false historical appearance because the replaced entrance or porch is based on insufficient historical, pictorial, and physical documentation.

Introducing a new entrance or porch that is incompatible in size, scale, material, and color.

Alterations/Additions for the New Use

Designing enclosures for historic porches when required by the new use in a manner that preserves the historic character of the building. This can include using large sheets of glass and recessing the enclosure wall behind existing scrollwork, posts, and balustrades.

Enclosing porches in a manner that results in a diminution or loss of historic character such as using solid materials such as wood, stucco, or masonry.

Recommended

Not Recommended

Designing and installing additional entrances, or porches when required for the new use **in a manner that preserves the historic character of the building, i.e., limiting such alteration to non-character-defining elevations.**

Installing secondary service entrances and porches that are incompatible in size and scale with the historic building or obscure, damage, or destroy **character-defining features.**

Storefronts

Storefronts are quite often the focus of historic commercial buildings and can thus be extremely important in defining the overall historic character. Because storefronts also play a crucial role in a store's advertising and merchandising strategy to draw customers and increase business, they are often altered to meet the needs of a new business. Particular care is required in planning and accomplishing work on storefronts so that the building's historic character is preserved in the process of rehabilitation. For specific guidance on the subject Preservation Briefs: 11 should be consulted. (See Reading List and Ordering Information on pg. 58.)

Recommended

Identifying, **retaining**, and **preserving** storefronts--and their functional and decorative features--that are important in defining the overall historic character of the building such as display windows, signs, doors, transoms, kick plates, corner posts, and entablatures.

Protecting **and maintaining** masonry, **wood**, and architectural metals which comprise storefronts through appropriate treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coating systems.

Protecting storefronts against arson and vandalism before work begins by boarding up windows and installing alarm systems that are keyed into local protection agencies.

Not Recommended

Removing or radically changing storefronts--and their features--which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Changing the storefront so that it appears residential rather than commercial in character.

Removing historic material from the storefront to create a recessed arcade.

Introducing coach lanterns, mansard overhangings, wood shakes, nonoperable shutters, and small-paned windows if they cannot be documented historically.

Changing the location of a storefront's main entrance.

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of storefront features results.

Permitting entry into the building through unsecured or broken windows and doors so that interior features and finishes are damaged through exposure to weather or through vandalism.

Stripping storefronts of historic material such as wood, cast iron, terra cotta, carrara glass, and brick.

Recommended

Evaluating the overall condition of storefront materials to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Repairing storefronts by reinforcing the historic materials. Repairs will also generally include the limited replacement in kind--or with compatible substitute material--of those extensively deteriorated or missing parts of storefronts where there are surviving prototypes such as transoms, kick plates, pilasters, or signs.

Replacing in kind an entire storefront that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. If using the same material is not technically or economically feasible, then compatible substitute materials may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and constructing a new storefront when the historic storefront is completely missing. It may be an accurate restoration using historical, pictorial, and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the historic building. Such new design should generally be flush with the facade; and the treatment of secondary design elements, such as awnings or signs, kept as simple as possible. For example, new signs should fit flush with the existing features of the facade, such as the fascia board or cornice.

Not Recommended

Failing to undertake adequate measures to assure the preservation of the historic storefront.

Replacing an entire storefront when repair of materials and limited replacement of its parts are appropriate.

Using substitute material for the replacement parts that does not convey the same visual appearance as the surviving parts of the storefront or that is physically or chemically incompatible.

Removing a storefront that is unrepairable and not replacing it; or replacing it with a new storefront that does not convey the same visual appearance.

Creating a false historical appearance because the replaced storefront is based on insufficient historical, pictorial, and physical documentation.

Introducing a new design that is incompatible in size, scale, material, and color.

Using new illuminated signs; inappropriately scaled signs and logos; signs that project over the sidewalk unless they were a characteristic feature of the historic building; or other types of signs that obscure, damage, or destroy remaining character-defining features of the historic building.

BUILDING INTERIOR

Structural System

If features of the structural system are exposed such as loadbearing brick walls, cast iron columns, roof trusses, posts and beams, vigas, or stone foundation walls, they may be important in defining the building's overall historic character. Unexposed structural features that are not character-defining or an entire structural system may nonetheless be significant in the history of building technology; therefore, the structural system should always be examined and evaluated early in the project planning stage to determine both its physical condition and its importance to the building's historic character or historical significance. See also Health and Safety Code Requirements.

Recommended

Identifying, retaining, and preserving structural systems--and individual features of systems--that are important in defining the overall historic character of the building, such as post and beam systems, trusses, summer beams, vigas, cast iron columns, above-grade stone foundation walls, or loadbearing brick or stone walls.

Not Recommended

Removing, covering, or radically changing features of structural systems which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Putting a new use into the building which could overload the existing structural system; or installing equipment or mechanical systems which could damage the structure.

Demolishing a loadbearing masonry wall that could be augmented and retained and replacing it with a new wall (i.e., brick or stone), using the historic masonry only as an exterior veneer.

Leaving known structural problems untreated such as deflection of beams, cracking and bowing of walls, or racking of structural members.

Utilizing treatments or products that accelerate the deterioration of structural material such as introducing urea-formaldehyde foam insulation into frame walls.

RecommendedNot Recommended

Protecting and maintaining the structural system by cleaning the roof gutters and downspouts; replacing roof flashing; keeping masonry, wood, and architectural metals in a sound condition; and assuring that structural members are free from insect infestation.

Examining and evaluating the physical condition of the structural system and its individual features using non-destructive techniques such as X-ray photography.

Repairing the structural system by augmenting or upgrading individual parts or features. For example, weakened structural members such as floor framing can be spliced, braced, or otherwise supplemented and reinforced.

Replacing in kind--or with substitute material--those portions or features of the structural system that are either extensively deteriorated or are missing when there are surviving prototypes such as cast iron columns, roof rafters or trusses, or sections of loadbearing walls. Substitute material should convey the same form, design, and overall visual appearance as the historic feature; and, at a minimum, be equal to its loadbearing capabilities.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Alterations/Additions for the New Use

Limiting any new excavations adjacent to historic foundations to avoid undermining the structural stability of the building or adjacent historic buildings.

Failing to provide proper building maintenance on a cyclical basis so that deterioration of the structural system results.

Utilizing destructive probing techniques that will damage or destroy structural material.

Upgrading the building structurally in a manner that diminishes the historic character of the exterior, such as installing strapping channels or removing a decorative cornice; or damages interior features or spaces.

Replacing a structural member or other feature of the structural system when it could be augmented and retained.

Installing a replacement feature that does not convey the same visual appearance, e.g., replacing an exposed wood summer beam with a steel beam.

Using substitute material that does not equal the loadbearing capabilities of the historic material and design or is otherwise physically or chemically incompatible.

Carrying out excavations or regrading adjacent to or within a historic building which could cause the historic foundation to settle, shift, or fail; or could have a similar effect on adjacent historic buildings.

RecommendedNot Recommended

Correcting structural deficiencies in preparation for the new use in a manner that preserves the structural system and individual character-defining features.

Designing and installing new mechanical or electrical systems when required for the new use which minimize the number of cutouts or holes in structural members.

Adding a new floor when required for the new use if such an alteration does not damage or destroy the structural system or, obscure, damage, or destroy character-defining spaces, features, or finishes.

Creating an atrium or a light well to provide natural light when required for the new use in a manner that assures the preservation of the structural system as well as character-defining interior spaces, features, and finishes.

Radically changing interior spaces or damaging or destroying features or finishes that are character-defining while trying to correct structural deficiencies in preparation for the new use.

Installing new mechanical and electrical systems or equipment in a manner which results in numerous cuts, splices, or alterations to the structural members.

Inserting a new floor when such a radical change damages a structural system or obscures or destroys interior spaces, features, or finishes.

Inserting new floors or furred-down ceilings which cut across the glazed areas of windows so that the exterior form and appearance of the windows are radically changed.

Damaging the structural system or individual features; or radically changing, damaging, or destroying character-defining interior spaces, features, or finishes in order to create an atrium or a light well.

Interior: Spaces, Features, and Finishes

An interior floor plan, the arrangement of spaces, and built-in features and applied finishes may be individually or collectively important in defining the historic character of the building. Thus, their identification, retention, protection, and repair should be given prime consideration in every rehabilitation project and caution exercised in pursuing any plan that would radically change character-defining spaces or obscure, damage or destroy interior features or finishes.

Recommended

Not Recommended

Interior Spaces

Identifying, **retaining**, and **preserving** a floor plan or interior spaces that are important in defining the overall historic character of the building. This includes the size, configuration, proportion, and relationship of rooms and corridors; the relationship of features to spaces; and the spaces themselves such as lobbies, reception halls, entrance halls, double parlors, theaters, auditoriums, and important industrial or commercial use spaces.

Radically changing a floor plan or interior spaces--including individual rooms--which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Altering the floor plan by demolishing principal walls and partitions to create a new appearance.

Altering or destroying interior spaces by inserting floors, cutting through floors, lowering ceilings, or adding or removing walls.

Relocating an interior feature such as a staircase so that the historic relationship between features and spaces is altered.

RecommendedNot RecommendedInterior Features and Finishes

Identifying, **retaining, and preserving** interior features and finishes that are important in defining the overall historic character of the building, including columns, cornices, baseboards, fireplaces and mantels, paneling, light fixtures, hardware, and flooring; and wallpaper, plaster, paint, and finishes such as stenciling, marbling, and graining; and other decorative materials that accent interior features and provide color, texture, and patterning to walls, floors, and ceilings.

Protecting and maintaining masonry, wood, and architectural metals which comprise interior features through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coatings systems.

Removing or radically changing features and finishes which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Installing new decorative material that obscures or damages character-defining interior features or finishes.

Removing paint, plaster, or other finishes from historically finished surfaces to create a new appearance (e.g., removing plaster to expose masonry surfaces such as brick walls or a chimney piece).

Applying paint, plaster, or other finishes to surfaces that have been historically unfinished to create a new appearance.

Stripping historically painted wood surfaces to bare wood, then applying clear finishes or stains to create a "natural look."

Stripping paint to bare wood rather than repairing or reapplying grained or marbled finishes to features such as doors and paneling.

Radically changing the type of finish or its color, such as painting a previously varnished wood feature.

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of interior features results.

Interior Features and Finishes (continued)

Recommended

Protecting interior features and finishes against arson and vandalism before project work begins, erecting protective fencing, boarding-up windows, and installing fire alarm systems that are keyed to local protection agencies.

Protecting interior features such as a staircase, mantel, or decorative finishes and wall coverings against damage during project work by covering them with heavy canvas or plastic sheets.

Installing protective coverings in areas of heavy pedestrian traffic to protect historic features such as wall coverings, parquet flooring and panelling.

Removing damaged or deteriorated paints and finishes to the next sound layer using the gentlest method possible, then repainting or refinishing using compatible paint or other coating systems.

Repainting with colors that are appropriate to the historic building.

Limiting abrasive cleaning methods to certain industrial or warehouse buildings where the interior masonry or plaster features do not have distinguishing design, detailing, tooling, or finishes; and where wood features are not finished, molded, beaded, or worked by hand. **Abrasive cleaning** should only be considered after other, gentler methods have been proven ineffective.

Evaluating the overall condition of materials to **determine** whether more than protection and maintenance are required, that is, if repairs to interior features and finishes will be necessary.

Not Recommended

Permitting entry into historic buildings through unsecured or broken windows and doors so that interior features and finishes are damaged by exposure to weather or through vandalism.

Stripping interiors of features such as woodwork, doors, windows, light fixtures, copper piping, radiators; or of decorative materials.

Failing to provide proper protection of interior features and finishes during work so that they are gouged, scratched, dented, or otherwise damaged.

Failing to take new use patterns into consideration so that interior features and finishes are damaged.

Using destructive methods such as propane or butane torches or sandblasting to remove paint or other coatings. These methods can irreversibly damage the historic materials that comprise interior features.

Using new paint colors that are inappropriate to the historic building.

Changing the texture and patina of character-defining features through sandblasting or use of other abrasive methods to remove paint, discoloration or plaster. This includes both exposed wood (including structural members) and masonry.

Failing to undertake adequate measures to assure the preservation of interior features and finishes.

Recommended

Repairing interior features and finishes by reinforcing the historic materials. Repair will also generally include the limited replacement in kind--or with compatible substitute material--of those extensively deteriorated or missing parts of repeated features when there are surviving prototypes such as stairs, balustrades, wood panelling, columns; or decorative wall coverings or ornamental tin or plaster ceilings.

Replacing in kind an entire interior feature or finish that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. Examples could include wainscoting, a tin ceiling, or interior stairs. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and installing a new interior feature or finish if the historic feature or finish is completely missing. This could include missing partitions, stairs, elevators, lighting fixtures, and wall coverings, or even entire rooms if all historic spaces, features, and finishes are missing or have been destroyed by inappropriate "renovations." The design may be a restoration based on historical, pictorial, and physical documentation; or be a new design that is compatible with the historic character of the building, district, or neighborhood.

Not Recommended

Replacing an entire interior feature such as a staircase, panelled wall, parquet floor, or cornice; or finish such as a decorative wall covering or ceiling when repair of materials and limited replacement of such parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts or portions of the interior feature or finish or that is physically or chemically incompatible.

Removing a character-defining feature or finish that is unrepairable and not replacing it; or replacing it with a new feature or finish that does not convey the same visual appearance.

Creating a false historical appearance because the replaced feature is based on insufficient physical, historical, and pictorial documentation or on information derived from another building.

Introducing a new interior feature or finish that is incompatible with the scale, design, materials, color, and texture of the surviving interior features and finishes.

RecommendedNot RecommendedAlterations/Additions for the New Use

Accommodating service functions such as bathrooms, mechanical equipment, and office machines required by the building's new use in secondary spaces such as first floor service areas or on upper floors.

Reusing decorative material or features that have had to be removed during the rehabilitation work including wall and baseboard trim, door moulding, panelled doors; and simple wainscoting; and relocating such material or features in areas appropriate to their historic placement.

Installing permanent partitions in secondary spaces; removable partitions that do not destroy the sense of space should be installed when the new use requires the subdivision of character-defining interior spaces.

Enclosing an interior stairway where required by code so that its character is retained. In many cases, glazed fire-rated walls may be used.

Placing new code-required stairways or elevators in secondary and service areas of the historic building.

Creating an atrium or a light well to provide natural light when required for the new use in a manner that preserves character-defining interior spaces, features, and finishes as well as the structural system.

Adding a new floor if required for the new use in a manner that preserves character-defining structural features, and interior spaces, features, and finishes.

Dividing rooms, lowering ceiling's, and damaging or obscuring character-defining features such as fireplaces, niches, stairways or alcoves, so that a new use can be accommodated in the building.

Discarding historic material when it can be reused within the rehabilitation project or relocating it in historically inappropriate areas.

Installing permanent partitions that damage or obscure character-defining spaces, features, or finishes.

Enclosing an interior stairway with fire-rated construction so that the stairwell space or any character-defining features are destroyed.

Radically changing, damaging, or destroying character-defining spaces, features, or finishes when adding new code-required stairways and elevators.

Destroying character-defining interior spaces, features, or finishes; or damaging the structural system in order to create an atrium or light well.

Inserting a new floor within a building that alters or destroys the fenestration; radically changes a character-defining interior space; or obscures, damages, or destroys decorative detailing.

Mechanical Systems:
Heating, Air Conditioning,
Electrical, and Plumbing

The visible features of historic heating, lighting, air conditioning and plumbing systems may sometimes help define the overall historic character of the building and should thus be retained and repaired, whenever possible. The systems themselves (the compressors, boilers, generators and their ductwork, wiring and pipes) will generally either need to be upgraded, augmented, or entirely replaced in order to accommodate the new use and to meet code requirements. Less frequently, individual portions of a system or an entire system are significant in the history of building technology; therefore, the identification of character-defining features or historically significant systems should take place together with an evaluation of their physical condition early in project planning.

Recommended

Identifying, **retaining, and preserving** visible features of early mechanical systems that are important in defining the overall historic character of the building, such as radiators, vents, fans, grilles, plumbing fixtures, switchplates, and lights.

Protecting and **maintaining** mechanical, plumbing, and electrical systems and their features through cyclical cleaning and other appropriate measures.

Preventing accelerated deterioration of mechanical systems by providing adequate ventilation of attics, crawlspaces, and cellars so that moisture problems are avoided.

Repairing mechanical systems by augmenting or upgrading system parts, such as installing new pipes and ducts; rewiring; or adding new compressors or boilers.

Not Recommended

Removing or radically changing features of mechanical systems that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Failing to provide adequate protection of materials on a **cyclical** basis so that deterioration of mechanical systems and their visible features results.

Enclosing mechanical systems in areas that are not adequately ventilated so that deterioration of the systems results.

Replacing a mechanical system or its functional parts when it could be upgraded and retained.

Recommended

Replacing in kind--or with compatible substitute material--those visible features of mechanical systems that are either extensively deteriorated or are missing when there are surviving prototypes such as ceiling fans, switchplates, radiators, grilles, or plumbing fixtures.

Not Recommended

Installing a replacement feature that does not convey the same visual appearance.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Alterations/Additions for the New Use

Installing a completely new mechanical system if required for the new use so that it causes the least alteration possible to the building's floor plan, the exterior elevations, and the least damage to historic building material.

Installing the vertical runs of ducts, pipes, and cables in closets, service rooms, and wall cavities.

Installing air conditioning units if required by the new use in such a manner that the historic materials and features are not damaged or obscured.

Installing heating/air conditioning units in the window frames in such a manner that the sash and frames are protected. Window installations should be considered only when all other viable heating/cooling systems would result in significant damage to historic materials.

Installing a new mechanical system so that character-defining structural or interior features are radically changed, damaged, or destroyed.

Installing vertical runs of ducts, pipes, and cables in places where they will obscure character-defining features.

Concealing mechanical equipment in walls or ceilings in a manner that requires the removal of historic building material.

Installing "dropped" acoustical ceilings to hide mechanical equipment when this destroys the proportions of character-defining interior spaces.

Cutting through features such as masonry walls in order to install air conditioning units.

Radically changing the appearance of the historic building or damaging or destroying windows by installing heating/air conditioning units in historic window frames.

BUILDING SITE

The relationship between a historic building or buildings and landscape features within a property's boundaries--or the building site--helps to define the historic character and should be considered an integral part of overall planning for rehabilitation project work.

Recommended

Identifying, retaining, and preserving buildings and their features as well as features of the site that are important in defining its overall historic character. Site features can include driveways, walkways, lighting, fencing, signs, benches, fountains, wells, terraces, canal systems, plants and trees, berms, and drainage or irrigation ditches; and archeological features that are important in defining the history of the site.

Retaining the historic relationship between buildings, landscape features, and open space.

Protecting and maintaining buildings and the site by providing proper drainage to assure that water does not erode foundation walls; drain toward the building; nor erode the historic landscape.

Not Recommended

Removing or radically changing buildings and their features or site features which are important in defining the overall historic character of the building site so that, as a result, the character is diminished.

Removing or relocating historic buildings or landscape features, thus destroying the historic relationship between buildings, landscape features, and open space.

Removing or relocating historic buildings on a site or in a complex of related historic structures--such as a mill complex or farm--thus diminishing the historic character of the site or complex.

Moving buildings onto the site, thus creating a false historical appearance.

Lowering the grade level adjacent to a building to permit development of a formerly below-grade area such as a basement in a manner that would drastically change the historic relationship of the building to its site.

Failing to maintain site drainage so that buildings and site features are damaged or destroyed; or, alternatively, changing the site grading so that water no longer drains properly.

Recommended

Minimizing disturbance of terrain around buildings or elsewhere on the site, thus reducing the possibility of destroying unknown archeological materials.

Surveying areas where major terrain alteration is likely to impact important archeological sites.

Protecting, e.g. preserving in place known archeological material whenever possible.

Planning and carrying out any necessary investigation using professional archeologists and modern archeological methods when preservation in place is not feasible.

Protecting the building and other features of the site against arson and vandalism before rehabilitation work begins, i.e., erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

Providing continued protection of masonry, wood, and architectural metals which comprise building and site features through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems; and continued protection and maintenance of landscape features, including plant material.

Evaluating the overall condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to building and site features will be necessary.

Not Recommended

Introducing heavy machinery or equipment into areas where their presence may disturb archeological materials.

Failing to survey the building site prior to the beginning of rehabilitation project work so that, as a result, important archeological material is destroyed.

Leaving known archeological material unprotected and subject to vandalism, looting, and destruction by natural elements such as erosion.

Permitting unqualified project personnel to perform data recovery so that improper methodology results in the loss of important archeological material.

Permitting buildings and site features to remain unprotected so that plant materials, fencing, walkways, archeological features, etc. are damaged or destroyed.

Stripping features from buildings and the site such as wood siding, iron fencing, masonry balustrades; or removing or destroying landscape features, including plant material.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of building and site features results.

Failing to undertake adequate measures to assure the preservation of building and site features.

Recommended

Repairing features of buildings and the site by reinforcing the historic materials. Repair will also generally include replacement in kind--with a compatible substitute material--of those extensively deteriorated or missing parts of features where there are surviving prototypes such as fencing and paving.

Replacing in kind an entire feature of the building or site that is too deteriorated to repair--if the overall form and detailing are still evident--using the physical evidence to guide the new work. This could include an entrance or porch, walkway, or fountain. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation project work and should only be considered after the preservation concerns listed above have been addressed.

Design for Missing Historic Features

Designing and constructing a new feature of a building or site when the historic feature is completely missing, such as an outbuilding, terrace, or driveway. It may be based on historical, pictorial, and physical documentation, or be a new design that is compatible with the historic character of the building and site.

Not Recommended

Replacing an entire feature of the building or site such as a fence, walkway, or driveway when repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the building or site feature or that is physically or chemically incompatible.

Removing a feature of the building or site that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Creating a false historical appearance because the replaced feature is based on insufficient historical, pictorial, and physical documentation.

Introducing a new building or site feature that is out of scale or otherwise inappropriate.

Introducing a new landscape feature or plant material that is visually incompatible with the site or that destroys site patterns or vistas.

RecommendedNot Recommended**Alterations/Additions for the New Use**

Designing new onsite parking, loading docks, or ramps when required by the new use so that they are as unobtrusive as possible and assure the preservation of character-defining features of the site.

Designing new exterior additions to historic buildings or adjacent new construction which is compatible with the historic character of the site and which preserve the historic relationship between a building or buildings, landscape features, and open space.

Removing nonsignificant buildings, additions, or site features which detract from the historic character of the site.

Placing parking facilities directly adjacent to historic buildings where automobiles may cause damage to the buildings or landscape features or be intrusive to the building site.

Introducing new construction onto the building site which is visually incompatible in terms of size, scale, design, materials, color and texture or which destroys historic relationships on the site.

Removing a historic building in a complex, a building feature, or a site feature which is important in defining the historic character of the site.

DISTRICT/NEIGHBORHOOD The relationship between historic buildings, and streetscape and landscape features within a historic district or neighborhood helps to define the historic character and therefore should always be a part of the rehabilitation plans.

Recommended

Identifying, retaining, and preserving buildings, and streetscape, and landscape features which are important in defining the overall historic character of the district or neighborhood. Such features can include streets, alleys, paving, walkways, street lights, signs, benches, parks and gardens, and trees.

Retaining the historic relationship between buildings, and streetscape and landscape features such as a town square comprised of row houses and stores surrounding a communal park or open space.

Protecting and maintaining the historic masonry, wood, and architectural metals which comprise building and streetscape features, through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective **coating** systems; and protecting and maintaining landscape features, including plant material.

Protecting buildings, paving, iron fencing, etc. against arson and vandalism before rehabilitation work begins by erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

Not Recommended

Removing or radically changing those features of the district or neighborhood which are important in defining the overall historic character so that, as a result, the character is diminished.

Destroying streetscape and landscape features by widening existing streets, changing paving material, or introducing inappropriately located new streets or parking lots.

Removing or relocating historic **buildings**, or features of the streetscape and landscape, thus destroying the historic relationship between buildings, features and open space.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of building, streetscape, and landscape features results.

Permitting buildings to remain unprotected so that windows are broken; and interior features are damaged.

Stripping features from buildings or the streetscape such as wood siding, iron fencing, or terra cotta balusters; or removing or destroying landscape features, including plant material.

Recommended

Evaluating the overall condition of building, streetscape and landscape materials to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Repairing features of the building, streetscape, or landscape by reinforcing the historic materials. Repair will also generally include the replacement in kind--or with a compatible substitute material--of those extensively deteriorated or missing parts of features when there are surviving prototypes such as porch balustrades, paving materials, or streetlight standards.

Replacing in kind an entire feature of the building, streetscape, or landscape that is too deteriorated to repair--when the overall form and detailing are still evident--using the physical evidence to guide the new work. This could include a storefront, a walkway, or a garden. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns Listed above have been addressed.

Design for Missing Historic Features

Designing and constructing a new feature of the building, streetscape, or landscape when the historic feature is completely missing, such as row house steps, a porch, streetlight, or terrace. It may be a restoration based on historical, pictorial, and physical documentation; or be a new design that is compatible with the historic character of the district or neighborhood.

Not Recommended

Failing to undertake adequate measures to assure the preservation of building, streetscape, and landscape features.

Replacing an entire feature of the building, streetscape, or landscape such as a porch, walkway, or streetlight, when repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the building, streetscape, or landscape feature or that is physically or chemically incompatible.

Removing a feature of the building, streetscape, or landscape that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Creating a false historical appearance because the replaced feature is based on insufficient historical, pictorial and physical documentation.

Introducing a new building, streetscape or landscape feature that is out of scale or otherwise inappropriate to the setting's historic character, e.g., replacing picket fencing with chain link fencing.

RecommendedNot Recommended**Alterations/Additions for the New Use**

Designing required new parking so that it is as unobtrusive as possible, i.e., on side streets or at the rear of buildings. "Shared" parking should also be planned so that several businesses can utilize one parking area as opposed to introducing random, multiple lots.

Designing and constructing new additions to historic buildings when required by the new use. New work should be compatible with the historic character of the district or neighborhood in terms of size, scale, design, material, color, and

Removing nonsignificant buildings, additions, or streetscape and landscape features which detract from the historic character of the district or the neighborhood.

Placing parking facilities directly adjacent to historic buildings which cause the removal of historic plantings, relocation of paths and walkways, or blocking of alleys.

Introducing new construction into historic districts that is visually incompatible or that destroys historic relationships within the district or neighborhood.

Removing a historic building, building feature, or landscape or streetscape feature that is important in defining the overall historic character of the district or the neighborhood.

Although the work in these sections is quite often **an** important aspect of rehabilitation projects, **it is usually not** part of the overall process of preserving **character-defining features** (maintenance, repair, replacement); rather, such work is assessed for its **potential** negative impact on the building's historic character. For this reason, particular **care** must be taken not to obscure, radically change, damage, or **destroy character-defining features** in the process of rehabilitation work to meet new use requirements.

HEALTH AND SAFETY CODE REQUIREMENTS

As a part of the new use, it is often necessary to make modifications to a historic building so that it can comply with current health, safety and code requirements. Such work needs to be carefully planned and undertaken so that it does not result in a loss of character-defining spaces, features, and finishes.

Recommended

Identifying the historic building's character-defining spaces, features, and finishes so that code-required work will not result in their damage or loss.

Complying with health and safety codes, including seismic codes and barrier-free access requirements, in such a manner that character-defining spaces, features, and finishes are preserved.

Working with local code officials to investigate alternative life safety measures or variances available under some codes so that alterations and additions to historic buildings can be avoided.

Providing barrier-free access through removable or portable, rather than permanent, ramps.

Providing seismic reinforcement to a historic building in a manner that avoids damaging the structural system and character-defining features.

Upgrading historic stairways and elevators to meet health and safety codes in a manner that assures their preservation, *i.e.*, so that they are not damaged or obscured.

Installing sensitively designed fire suppression systems, such as a sprinkler system for wood frame mill buildings, instead of applying fire-resistant sheathing to character-defining features.

Not Recommended

Undertaking code-required alterations to a building or site before identifying those spaces, features, or finishes which are character-defining and must therefore be preserved.

Altering, damaging, or destroying character-defining spaces, features, and finishes while making modifications to a building or site to comply with safety codes.

Making changes to historic buildings without first seeking alternatives to code requirements.

Installing permanent ramps that damage or diminish character-defining features.

Reinforcing a historic building using measures that damage or destroy character-defining structural and other features.

Damaging or obscuring historic stairways and elevators or altering adjacent spaces in the process of doing work to meet code requirements.

Covering character-defining wood features with fire-resistant sheathing which results in altering their visual appearance.

HEALTH AND SAFETY CODE REQUIREMENTS (continued)

Recommended

Applying fire-retardant coatings, such as intumescent paints, which expand during fire to add thermal protection to steel.

Adding a new stairway or elevator to meet health and safety codes in a manner that preserves adjacent character-defining features and spaces.

Placing a code-required stairway or elevator that cannot be accommodated within the historic building in a new exterior addition. Such an addition should be located at the rear of the building or on an inconspicuous side; and its size and scale limited in relationship to the historic building,

Not Recommended

Using fire-retardant coatings if they damage or obscure character-defining features.

Radically changing, damaging, or destroying character-defining spaces, features, or finishes when adding a new code-required stairway or elevator.

Constructing a new addition to accommodate code-required stairs and elevators on character-defining elevations highly visible from the street; or where it obscures, damages or destroys character-defining features.

ENERGY RETROFITTING

Some character-defining features of a historic building or site such as cupolas, shutters, transoms, skylights, sun rooms, porches, and plantings also play a secondary energy conserving role. Therefore, prior to retrofitting historic buildings to make them more energy efficient, the first step should always be to identify and evaluate the existing historic features to assess their inherent energy conserving potential. If it is determined that retrofitting measures are necessary, then such work needs to be carried out with particular care to insure that the building's historic character is preserved in the the process of rehabilitation.

Recommended

Not Recommended

District/Neighborhood

Maintaining those existing landscape features which moderate the effects of the climate on the setting such as deciduous trees, evergreen wind-blocks, and lakes or ponds.

Stripping the setting of landscape features and landforms so' that the effects of the wind, rain, and the sun result in accelerated deterioration of historic materials.

Building Site

Retaining plant materials, trees, and landscape features, especially those which perform passive solar energy functions such as sun shading and wind breaks.

Removing plant materials, trees, and landscape features, so that they no longer perform passive solar energy functions.

Installing freestanding solar collectors in a manner that preserves the historic property's character-defining features.

Installing freestanding solar collectors that obscure, damage, or destroy historic landscape or archeological features.

Designing attached solar collectors, including solar greenhouses, so that the character-defining features of the property are preserved.

Locating solar collectors where they radically change the property's appearance; or damage or destroy character-defining features.

ENERGY RETROFITTING (continued)

Recommended

Not Recommended

Masonry/Wood/Architectural Metals

Installing thermal insulation in attics and in unheated cellars and crawlspaces to increase the efficiency of the existing mechanical systems.

Installing insulating material on the inside of masonry walls to increase energy efficiency where there is no character-defining interior moulding around the window or other interior architectural detailing.

Installing passive solar devices such as a glazed "trombe" wall on a rear or inconspicuous side of the historic building.

Applying urea formaldehyde foam or any other thermal insulation with a water content into wall cavities in an attempt to reduce energy consumption.

Resurfacing historic building materials with more energy efficient but incompatible materials, such as covering historic masonry with exterior insulation.

Installing passive solar devices such as an attached glazed "trombe" wall on primary or other highly visible elevations; or where historic material must be removed or obscured.

Roofs

Placing solar collectors on non-character-defining roofs or roofs of nonhistoric adjacent buildings.

Placing solar collectors on roofs when such collectors change the historic roofline or obscure the relationship of the roof to character-defining roof features such as dormers, skylights, and chimneys.

Windows

Utilizing the inherent energy conserving features of a building by maintaining windows and louvered blinds in good operable condition for natural ventilation.

Improving thermal efficiency with weatherstripping, storm windows, caulking, interior shades, and, if historically appropriate, blinds and awnings.

Installing interior storm windows with air-tight gaskets, ventilating holes, and/or removable clips to insure proper maintenance and to avoid condensation damage to historic windows.

Removing historic shading devices rather than keeping them in an operable condition.

Replacing historic multi-paned sash with new thermal sash utilizing false muntins.

Installing interior storm windows that allow moisture to accumulate and damage the window.

Windows (continued)

RecommendedNot RecommendedWindows (continued)

Installing exterior storm windows which do not damage or obscure the windows and frames.

Installing new exterior storm windows which are inappropriate in size or color, which are inoperable.

Replacing windows or transoms with fixed thermal glazing or permitting windows and transoms to remain inoperable rather than utilizing them for their energy conserving potential.

Considering the use of lightly tinted glazing on non-character-defining elevations if other energy retrofitting alternatives are not possible.

Using tinted or reflective glazing on character-defining or other conspicuous elevations.

Entrances and Porches

Utilizing the inherent energy conserving features of a building by maintaining porches, and double vestibule entrances, in good condition so that they can retain heat or block the sun and provide natural ventilation.

Enclosing porches located on character-defining elevations to create passive solar collectors or airlock vestibules. Such enclosures can destroy the historic appearance of the building.

Interior Features

Retaining historic interior shutters and transoms for their inherent energy conserving features.

Removing historic interior features which play a secondary energy conserving role.

New Additions to Historic Buildings

Placing new additions that have an energy conserving function such as a solar greenhouse on non-character-defining elevations.

Installing new additions such as multi-story solar greenhouse additions which obscure, damage, destroy character-defining features.

Mechanical Systems

Installing thermal insulation in attics and in unheated cellars and crawlspaces to conserve energy.

Applying urea formaldehyde foam or any other thermal insulation with a water content or that may collect moisture into wall cavities.

NEW ADDITIONS TO HISTORIC BUILDINGS

An attached exterior addition to a historic building expands its "outer limits" to create a new profile. Because such expansion has the capability to radically change the historic appearance, an exterior addition should be considered only after it has been determined that the new use cannot be successfully met by altering non-character-defining interior spaces. If the new use cannot be met in this way, then an attached exterior addition is usually an acceptable alternative. New additions should be designed and constructed so that the character-defining features of the historic building are not radically changed, obscured, damaged, or destroyed in the process of rehabilitation. New design should always be clearly differentiated so that the addition does not appear to be part of the historic resource.

Recommended

Placing functions and services required for the new use in non-character-defining interior spaces rather than installing a new addition.

Constructing a new addition so that there is the least possible loss of historic materials and so that character-defining features are not obscured, damaged, or destroyed.

Locating the attached exterior addition at the rear or on an inconspicuous side of a historic building; and limiting its size and scale in relationship to the historic building.

Designing new additions in a manner that makes clear what is historic and what is new.

Not Recommended

Expanding the size of the historic building by constructing a new addition when the new use could be met by altering non-character-defining interior spaces.

Attaching a new addition so that the character-defining features of the historic building are obscured, damaged, or destroyed.

Designing a new addition so that its size and scale in relation to the historic building are out of proportion, thus diminishing the historic character.

Duplicating the exact form, material, style, and detailing of the historic **building** in the new addition so that the new work appears to be part of the historic building.

Imitating a historic style or period of architecture in new additions, especially for contemporary uses such as drive-in banks or garages.

Recommended

Considering the attached exterior addition both in terms of the new use and the appearance of other buildings in the historic district or neighborhood. Design for the new work may be contemporary or may reference design motifs from the historic building. In either case, it should always be clearly differentiated from the historic building and be compatible in terms of mass, materials, relationship of solids to voids, and color.

Placing new additions such as balconies and greenhouses on non-character-defining elevations and limiting the size and scale in relationship to the historic building.

Designing additional stories, when required for the new use, that are set back from the wall plane and are as inconspicuous as possible when viewed from the street.

Not Recommended

Designing and constructing new additions that result in the diminution or loss of the historic character of the resource, including its design, materials, workmanship, location, or setting.

Using the same wall plane, roof line, cornice height, materials, siding lap or window type to make additions appear to be a part of the historic building.

Designing new additions such as multi-story greenhouse additions that obscure, damage, or destroy character-defining features of the historic building.

Constructing additional stories so that the historic appearance of the building is radically changed.

READING LIST AND ORDERING INFORMATION

Preservation Tax Incentives Program Information

* Tax Incentives for Rehabilitating Historic Buildings. Program leaflet. Explains the Federal tax incentives available to owners who rehabilitate commercial historic structures. Includes an outline of the certification process, program regulations, and a list of State Historic Preservation Officers. 12 pages. May, 1982.

Preservation Briefs are prepared for property owners, developers, or Federal agency managers to assist in evaluating and resolving common preservation and repair problems. The briefs are often given to preservation tax incentives program applicants to help explain recommended historic preservation method and approaches in the rehabilitation of historic buildings. Copies, except where noted, are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. GPO prices are subject to change without notice.

* Preservation Briefs: 1. The Cleaning and Waterproof Coating of Masonry Buildings by Robert C. Mack, AIA. Provides guidance on the techniques of cleaning and waterproofing and explains the consequences of their inappropriate use. 4 pages. 5 illus. November, 1975.

Preservation Briefs: 2. Repointing Mortar Joints in Historic Brick Buildings by Robert C. Mack, AIA, de Teel Patterson Tiller, and James S. Askins. Provides update on appropriate materials and methods for repointing historic buildings. 8 pages. 12 illus. August, 1980. GPO Stock Number 024-016-00148-6: 1-100 copies, \$2.25 each; multiples of 100, \$22.

Preservation Briefs: 3. Conserving Energy in Historic Buildings by Baird M. Smith, AIA. Provides information on materials and techniques to consider or avoid when undertaking weatherization and energy conservation measures in historic buildings. 8 pages. 8 illus. April, 1978. GPO Stock Number: 024-016-00103-6: 1-100 copies, \$2.25 each; multiples of 100, \$22.

Preservation Briefs: 4. Roofing for Historic Buildings by Sarah M. Sweetser. Provides a brief history of the most commonly used roofing materials in America. Presents a sound preservation approach to roof repair, roof replacement, and the use of alternative roofing materials. 8 pages. 15 illus. February, 1978. GPO Stock Number: 024-016-00102-8; 1-100 copies, \$2.25 each; multiples of 100, \$22.

* Preservation Briefs: 5. The Preservation of Historic Adobe Buildings. Provides information on the traditional materials and construction of adobe buildings, and the causes of adobe deterioration. Makes recommendations for preserving historic adobe buildings. 8 pages. 10 illus. August, 1978.

* Unavailable from the Government Printing Office. Single copies available from the National Park Service Regional Offices (see Introduction to Guidelines).

Preservation Briefs: 6. Dangers of Abrasive Cleaning to Historic Buildings by Anne E. Grimmer. Cautions against the use of sandblasting to clean various buildings and suggests measures to **mitigate** the effects of improper cleaning. Explains the limited circumstances under which abrasive cleaning may be appropriate. 8 pages. 10 illus. June, 1979. GPO Stock Number: 024-016-00112-5: 1-100 copies, \$2.25. each; multiples of 100, \$22.

Preservation Briefs: 7. The Preservation of Historic Glazed Architectural Terra-cotta by de Teel Patterson Tiller. Discusses deterioration problems that commonly occur with terra-cotta and provides methods for determining the extent of such deterioration. Makes recommendations for maintenance and repair, and suggests appropriate replacement materials. 8 pages. 11 illus. June, 1979. GPO Stock Number: 024-016-00115-0: 1-100 copies, \$2.25 each; multiples of 100, \$22.

Preservation Briefs: 8. Aluminum and Vinyl Sidings on Historic Buildings by John H. Myers. Discusses esthetic and technical considerations surrounding use of these substitute replacement materials. 8 pages. 11 illustrations. October, 1979. CURRENTLY OUT-OF-PRINT--TO BE REVISED AND REPRINTED IN 1983.

Preservation Briefs: 9. The Repair of Historic Wooden Windows by John H. Myers. Provides useful information on evaluating and repairing historic wooden windows found in typical rehabilitation projects. **Emphasizes practical** technology for homeowners or developers. 8 pages. 10 illustrations. January, 1981. GPO Stock Number: 024-016-00147-8: 1-100 copies, \$2.25 each; multiples of 100, \$22.

Preservation Briefs: 10. Exterior Paint Problems on Historic Woodwork by Kay D. Weeks and David W. Look, AIA. Identifies and describes common **types** of paint surface conditions and failures. **Provides** guidance on preparing historic **woodwork** for repainting, including limited and total paint removal. 12 pages. 14 illus. November, 1982. GPO Stock Number: 024-005-00842-0: \$2.25 each.

Preservation Briefs: 11. Rehabilitating Historic Storefronts by H. Ward Jandl. Explores the role of the storefront in historic buildings and provides guidance on rehabilitation techniques for storefronts as well as compatible new storefront designs. 12 pages. 12 illus. November, 1982. GPO Stock Number: 024-005-00843-8: \$2.25 each,

Technical Reports address in detail technical problems confronted by architects, engineers, government officials, and other technicians involved with the preservation of historic buildings. Copies, except where noted, are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. GPO prices are subject to change without notice.

Access to Historic Building for the Disabled: Suggestions for Planning and Implementation by Charles Parrott. Addresses the special concerns of improved access by disabled persons to historic buildings, as well as legal requirements and compliance planning **procedures**. Also examines techniques to make programs and services housed in historic buildings accessible in lieu of architectural changes. 92 pages. 42 illus. 1980. GPO Stock Number: 024-016-00149-4. \$5.50.

Cyclical Maintenance for Historic Buildings by J. Henry Chambers, AIA. Provides a step-by-step **process** for building managers, architects, and others involved in the routine maintenance of historic properties. 125 pages. 1976. GPO Stock Number: 024-005-00637-1. \$6.50.

** Directory of Historic Preservation Easement Organizations compiled by Charles E. Fisher, William G. MacRostie, and Christopher A. Sowick. Lists over 185 organizations throughout the nation who are willing to accept historic preservation easements. 23 pages. 3 illus. Rev., December, 1981.

Epoxies for Wood Repairs in Historic Buildings by Morgan W. Phillips and Judith E. Selwyn. Presents research findings on the formulations of epoxy consolidants and patching compounds for use on wooden elements in preservation projects, including case study applications. 72 pages. 43 illus. Appendix. 1978. GPO Stock Number: 024-016-00095-1. \$5.00.

** Exterior Cleaning of Historic Masonry Buildings by Norman R. Weiss. Discusses various methods of cleaning and the complex factors to consider before selecting a suitable method. Intended primarily for architects, conservators, and other professionals responsible for the preparation of specifications and development of agency-wide cleaning programs. 18 pages. Selected bibliography. 1977.

Gaslighting in America: A Guide for Historic Preservation by Denys Peter Myers. Surveys interior and exterior gaslighting fixtures used in America, providing histories of the major manufacturing firms and a listing of the charter dates for individual and city gas companies. 248 pages. 120 illus. Appendix. Bibliography. 1978. GPO Stock Number: 024-016-00094-3. \$8.50.

Metals in America's Historic Buildings: Uses and Preservation Methods by Margot Gayle and David W. Look, AIA (Part I); and John Waite (Part II). Concentrates on the historic uses of such architectural metals as lead, tin, zinc, copper, nickel, iron, steel, and aluminum (Part I). Also discusses the sources of metal deterioration and suggests appropriate preservation and maintenance techniques, addressing each metal individually (Part II). 170 pages. 180 illus. 1980. GPO Stock Number 024-016-00143-5. \$7.00.

** Moving Historic Buildings by John Obed Curtis. Discusses the limited circumstances under which a historic masonry or frame building should be moved; establishes a methodology for planning, research, and recording prior to the move; and addresses the actual siting, foundation construction, building reassembly, and restoration after a successful move has taken place. 56 pages. 47 illus. Selected bibliography. 1979.

** Photogrammetric Recording of Cultural Resources by Perry E. Borchers. Describes the basic principles of photogrammetry and their application to the recording of cultural resources. 38 pages. 28 illus. 1977.

Rectified Photography and Photo Drawings for Historic Preservation by J. Henry Chambers, AIA. Presents a method developed for the preparation of photographic working drawings and photodocumentation. Intended for architects. 37 pages. 13 illus. 1973. GPO Stock Number: 024-016-00124-9. \$4.75.

** Unavailable from the Government Printing Office. Requests for single copies may be sent to Technical Preservation Services, Preservation Assistance Division, National Park Service, Washington, D.C. 20240. Due to limited stock, copies of all materials requested may not be available.

Rehabilitation of Historic Buildings: An Annotated Bibliography by Frederic E. Kleye. Cites readily available literature on various aspects of building rehabilitation with chapters on economics, building regulations, technical preservation topics, and selected case studies. 21 pages. 1980. GPO Stock Number: 024-016-00130-3. \$3.50.

Wallpapers in Historic Preservation by Catherine Lynn Frangiamore. Surveys the technology, styles, and uses of wallpapers in America with suggestions for using wallpaper within a restoration project. 56 pages. 39 illus. Appendices. 1977. GPO Stock Number: 024-005-00685-1. \$5.00.

** X-Ray Examination of Historic Structures by David M. Hart. Discusses a method for investigating a building's fabric by non-destructive means. Intended for architects, conservators, and other professionals. 24 pages. 19 illus. 1975.

** Unavailable from the Government Printing Office. Requests for single copies may be sent to: Technical Preservation Services, Preservation Assistance Division, National Park Service, Washington, D.C. 20240. Due to limited stock, copies of all materials requested may not be available.

TPS Publications: Outside The Government Printing Office

Some of the publications TPS has developed have been printed by the private sector and are only available from these non-governmental sources. The following list includes the sources' addresses:

Energy Conservation and Solar Energy for Historic Buildings: Guidelines for Appropriate Designs. Prepared for Technical Preservation Services, National Park Service, by Thomas Vonier Associates, Inc. funded by the U. S. Department of Energy. Provides design guidance on energy conservation measures and solar energy applications for historic buildings. 24 pages. 28 illus. November 1981. Available for \$6.95, prepaid, from: The National Center for Architecture and Urbanism, 1927 S Street, N.W., Suite 300, Washington, D.C. 20009.

Respectful Rehabilitation: Answers to Your Questions on Historic Buildings. Prepared by Technical Preservation Services, National Park Service, U.S. Department of the Interior, and published by the Preservation Press of the National Trust for Historic Preservation. Provides answers to 150 questions which are often posed in the course of rehabilitating historic structures. Topics covered range from paint, wood, masonry, metals, and interior features to mechanical systems and health and safety codes. 185 pages. 150 illus. September 1982. Available for \$9.95 plus \$2.50 for postage and handling from: Preservation Shops, 1600 H Street, N.W., Washington, D.C. 20006.

Historic Landscape Initiative Update

Secretary of the Interior's Standards for Historic Preservation Projects Guidelines for the Treatment of Historic Landscapes

prepared for the ASLA-NPS Historic Landscape Preservation Symposium
October 28-29, 1990

Introduction

The Preservation Assistance Division (PAD) of the National Park Service is responsible for developing standards and guidelines for the treatment of historic resources listed on or eligible for the National Register of Historic Places. The **Secretary of the Interior's Standards for Historic Preservation Projects** provide general objectives and principles which prescribe the scope and appropriateness of such work for seven treatments: acquisition, stabilization, protection, preservation, rehabilitation, restoration and reconstruction. Selecting a project work treatment involves selection of specific standards that correspond to the work and can thus guide it to a consistent end.

The scope of work considered appropriate necessarily differs in these treatments. For example, both protection and stabilization seek to arrest deterioration -- often preparatory to other work -- without extensive repairs and replacement of the property's existing materials and features. Preservation calls for repair and maintenance of existing historic materials; in the case of landscapes, this could involve the constant removal of unwanted plant material in order to retain the existing landscape form. Rehabilitation may be the most common treatment today, even in historic landscapes, as it calls for repair and limited replacement of deteriorated or missing features, and permits new construction in order to accommodate a new use. Restoration, by definition, involves removal of later historic features and replacement of missing earlier features in order to illustrate a particular period of significance to the public. For restoration as well as reconstruction, which provides for construction of a vanished historic property, thorough documentation is required.

The rehabilitation standards, used primarily for the Federal tax credits program, were revised in the spring of 1990. At present, NPS is considering revisions to the other standards to make them consistent with the rehabilitation standards, and to ensure that the standards work as well for landscapes as they do for buildings and archeological resources. The draft revised standards are included for your information.

PAD is also developing specific guidance for the treatment of historic landscapes. The **Guidelines for the Treatment of Historic Landscapes** will interpret the general standards, providing specific work examples and suggestions for work projects for all treatments. Used together, standards and guidelines will provide much needed direction for landscape architects, managers, administrators, planners, and academics who are planning and undertaking work on historic landscapes.

Approach

Standards

An approach has been adopted that calls for general and specific standards that can be applied to all historic properties. To this end, the NPS recommends that the term "historic property" be used to encompass the individual resource types such as buildings, structures, landscapes, objects, or archeological sites.

The revised specific standards for six of the seven work treatments (protection, stabilization, preservation, restoration and reconstruction) include language and principles that reference historic landscapes, but apply to all historic properties. Finally, a change to the March 1990 revised rehabilitation standards is proposed that would alter standard 1, which addresses the continuing or new use of a property. The revision deletes the phrase "of the building and its site and environment" and replaces it with "of the property and environment." This revision makes the standard apply evenly to all historic properties, eliminating the perceived emphasis on buildings.

Guidelines

The NPS will also develop a "handbook" which provides guidance for the treatment of historic landscapes. The handbook will include guidelines similar to the rehabilitation guidelines developed for historic buildings. It is our intent that the handbook include a narrative introduction which addresses topics such as integrity, significance, and choosing the appropriate treatment; the revised standards; and guidelines for applying the treatments to landscape features. We propose that the Guidelines be organized by landscape feature, including examples from all preservation treatments. The guidelines will be illustrated with diagrams, photographs, and drawings. A draft outline of the handbook is attached.

Schedule/Process for the Standards and Landscape Guidelines

1. The enclosed draft standards were distributed in August to State Historic Preservation Offices, municipal offices, professional organizations (including the ASLA Open Committee on Historic Preservation), and NPS Regions for review and comment. This initial deadline has passed, but opportunities still exist for additional input. If you are interested in submitting comments, please contact the ASLA Open Committee Co-chairs, Patricia O'Donnell and Noel Vernon.

2. NPS will revise the draft standards based on comments and suggestions (Late Fall 1990)

3. NPS will host an historic landscape symposium to discuss the revised standards and landscape guidelines (Winter 1991)

4. NPS will prepare symposium proceedings (Late Winter 1991)

5. Draft revised standards will be published in the Federal Register for public comment (1991)

6. Draft landscape guidelines handbook with illustrations will be prepared for comment (1991)

7. Illustrated landscape guidelines will be published and distributed (1991-1992).

Issues for Your Consideration

The Secretary of the Interior's Standards provide principles for the treatment of historic landscapes under eligible for or listed on the National Register of Historic Places. They should serve as a minimum benchmark for the preservation of historic character. The standards should always be considered when work is proposed in a historically significant landscape.

Your Assistance is Needed For:

1. Comments and **suggestions** on the revised standards
2. Comments and suggestions on the landscape guidelines
 - a. Issues and topics to be addressed
 - b. Examples of successful treatment projects

Comments and suggestions related to standards and guidelines should be sent to:
Noel Vernon, Co-chair
ASLA Open Committee on Historic Preservation
Ball State University
College of Architecture and Planning
Department of Landscape Architecture
Muncie, Indiana 47306-0310

3. Suggestions for technical information related to the treatment of historic landscapes including technical information that is needed in the field as well as possible case studies:
 - a. Tech Notes (project specific)
 - b. Preservation Briefs (addresses more general preservation issues)

Comments on technical information should be sent to:
Lauren Meier
Historical Landscape Architect
National Park Service
Preservation Assistance Division (424)
P.O. Box 37127
Washington, D.C. 20013-7127
(202) 343-9597

Secretary of the Interior's Standards for Historic Preservation Projects

ACQUISITION

Acquisition is defined as the act or process of acquiring, through purchase or donation, fee title or interest other than fee title of real property.

Standards for Acquisition

1. Careful consideration shall be given to the type and extent of property rights which are required to ensure the preservation of the historic resource and its setting. The preservation objectives shall determine the exact property rights to be acquired.
2. The purchase of less-than-fee-simple interests, such as facade, conservation, or scenic easements, shall be undertaken when a limited interest achieves the same preservation objectives as fee simple acquisition.
3. Properties shall be acquired in fee simple when absolute ownership is required to ensure their preservation.
4. All components of the property necessary to protect its historic significance shall be acquired. These include land, viewsheds, outbuildings, furnishings, archeological remains, and other features associated with the property.

PROTECTION

Protection is defined as the act or process of applying measures necessary to safeguard the historic character of a property by defending or guarding it from further deterioration, loss, or attack, or to shield it from danger or injury. In the case of buildings, structures, objects, or landscapes, such treatment is generally of a temporary nature and anticipates future historic preservation treatment; in the case of archeological sites, the measure may be temporary or permanent.

Standards for Protection

1. An analysis of the actual or anticipated threats to the property shall be made prior to applying protective measures.
2. Protection shall safeguard the existing condition of a property from further deterioration or damage caused by natural forces or human activity.
3. If deteriorated or threatened historic materials or features must be removed during the process of protection, they shall be repaired and reused or properly recorded and safely stored until a future treatment is determined.
4. If a distinctive feature no longer performs its function or is vulnerable to vandalism, a suitable protective covering shall be applied until the feature can be repaired or replaced with a new feature that matches the old in design, color, texture, and other visual qualities and, where possible, materials.
5. Invasive vegetation that damages or threatens historic materials and features shall be controlled using the gentlest means possible.
6. A property shall be used for its historic purpose; or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
7. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
8. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties, shall be avoided.
9. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
10. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
11. Deteriorated historic features shall be repaired rather than replaced.
12. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
13. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

STABILIZATION

Stabilization is defined as the act or process of applying measures necessary to reestablish the stability of a unsafe, damaged, or deteriorated property while retaining the essential form as it exists at present.

Standards for Stabilization

1. Stabilization shall reestablish the stability of a property through reinforcement or by arresting material deterioration leading to structural or environmental failure.
2. Stabilization shall be accomplished in such a manner that it does not cause damage to any character-defining features, and in such a way that does not detract from the property's appearance. When reinforcement is required, such work shall be concealed wherever possible, except where concealment would result in the alteration or destruction of the materials, features, or spaces that characterize the historic property.
3. Invasive vegetation that threatens the stability of a structure or landscape feature shall be controlled using the gentlest means possible.
4. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
5. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
6. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.
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9. Deteriorated historic features shall be repaired rather than replaced.
10. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
11. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

PRESERVATION

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and material of an historic property. It may include initial stabilization work, where necessary, as well as ongoing maintenance and repair of the historic materials and features.

Standards for Preservation

1. Preservation shall retain the existing form, integrity, materials and character-defining features of the historic building, structure, landscape, object, or site, by arresting or retarding the deterioration of a property through a program of ongoing maintenance.
2. Preservation shall manage vegetation change through ongoing maintenance of existing historic plant material, including the removal of invasive or severely deteriorated plant material. Replacement of historic plant material, when necessary to preserve the character of the property, shall match the historic appearance, function, and, where possible, species or variety.
3. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
4. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
5. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.
6. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
7. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
8. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary or physical evidence.
9. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
10. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

REHABILITATION

Rehabilitation is defined as the act or process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historical and cultural values.

Standards for Rehabilitation

1. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

2. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

"3. Construction of historic designs that were never built shall not be undertaken.

"4. New additions, alterations, or new construction in an historic landscape shall be visually differentiated from the old and shall be compatible with the historic character of the landscape.

*5. Replacement of missing historic plant material or vegetation features shall be substantiated by documentary or physical evidence. The replacement plant material or features shall match the historic appearance, function, and where possible, species or variety.

6. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.

7. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

8. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.

9. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

10. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

11. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be **substantiated by** documentary or physical evidence.

12. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

13. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

Note: * These standards may not apply to tax act projects

RESTORATION

Restoration is defined as the act or process of accurately recovering the form, features and details of a property as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work.

Standards for Restoration

1. Restoration shall be undertaken only when there is definitive physical and documentary evidence as a basis for the work and when restoration is essential for understanding and interpreting the value of the property. Restoration work shall be consistent with the period of significance of the historic building, structure, landscape, object, or site.
2. The existing condition of a property to be restored shall be documented prior to the alteration or removal of characterdefining features.
3. Restoration shall recognize the dynamic nature of landscapes; vegetation that existed during the period of significance shall not be removed, unless removal and replacement is essential to maintain the character of the landscape.
4. Restoration shall replace missing vegetation features by duplicating the historic feature in form, mass, texture, color, function, and other visual qualities, and where possible, species or variety. The new feature shall be based on physical or documentary evidence.
5. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
6. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided unless it is essential to restore the property to an earlier period.
7. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.
8. Most properties change over time; those changes that occurred within the period of significance shall be retained and preserved.
9. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that represent the period of significance shall be preserved.
10. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary or physical evidence.
11. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
12. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

RECONSTRUCTION

Reconstruction is defined as the act or process of reproducing by new construction, the exact form, features and details of a vanished building, structure, landscape, or object as it appeared at a specific period of time and on its original site.

Standards for Reconstruction

1. Reconstruction of a part or all of a property in its historic location shall be appropriate when the reconstruction is essential for understanding and interpreting its value; when no other building, structure, landscape, or object with the same associative value has survived; and when sufficient historical documentation exists to insure an accurate reproduction of the original. Reconstructions shall be clearly identified.
2. Reconstruction shall duplicate all missing elements of the property in design, color, texture, and other visual qualities and, where possible, materials including plant species and variety. Reconstruction of missing features and elements shall be based upon accurate duplication of historic features and elements, substantiated by documentary or physical evidence, rather than upon conjectural designs or the availability of different features from other historic properties.
3. Reconstruction of a building, structure, landscape, or object shall be preceded by a thorough archeological investigation to locate, identify, and evaluate the significance of all subsurface features and artifacts. If any significant archeological resources must be disturbed, mitigation measures shall be undertaken.

DRAFT
O U T L I N E
Guidelines for the Treatment of Historic Landscapes

Preface

- Acknowledgements
- Process for Developing the Standards and Guidelines
- Definitions

Introduction

- Purpose of the Standards and Guidelines
- Preservation Process: Inventory, Analysis, Treatment
- Assessing Integrity and Significance in an Historic Landscape
- Choosing the Appropriate Treatment
- Special Issues
 - Changes in-use in a historic landscape
 - Handicapped access
 - New construction
 - Substitute materials
 - Historic designs that were never built

The Secretary of the Interior's Standards for Historic Preservation Projects

- Acquisition
- Protection
- Stabilization
- Preservation
- Rehabilitation
- Restoration
- Reconstruction**

Guidelines for the Treatment of Historic Landscapes

- Historic **Setting**
 - Relationship of the **property** to its **neighborhood/community**
 - Relation of the environment to the **property**

- Historic **Property**

- Overall spatial **relationships/Historic boundary/Views** and vistas
- Natural Systems
- Design Intent/Functional Response

- Historic Landscape **Features/Elements**

- Landform
- Plant Material and Vegetation Features
- Water **Features/Elements**
- Circulation
- Structures
- Site Furnishings (Functional elements)
- Objects [Decorative elements]
- Recreation: **Facilities**
 - Ball fields and courts
 - Golf courses
 - Swimming facilities
 - Picnic areas and Camping grounds

Other Issues:

- Uses
 - Agricultural
 - Recreational
 - Industrial
 - Residential

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Materials

Masonry

Wood

Stone

Wrought Iron

Concrete

Secretary of the Interior's Standards for Historic Preservation Projects

ACQUISITION

Acquisition is defined as the act or process of acquiring, through purchase or donation, fee title or interest other than fee title of real property.

Standards for Acquisition

1. Careful consideration shall be given to the type and extent of property rights which are required to ensure the preservation of the historic resource and its setting. The preservation objectives shall **determine** the exact property rights to be acquired.
2. The purchase of less-than-fee-simple interests, such as facade, conservation, or scenic easements, shall be undertaken when a limited interest achieves the same preservation objectives as fee simple acquisition.
3. Properties shall be acquired in fee simple when absolute ownership is required to ensure their preservation.
4. All components of the property necessary to protect its historic significance shall be acquired. These include land, **viewsheds**, outbuildings, furnishings, archeological remains, and other features associated with the property.

PROTECTION

Protection is defined as the act or process of applying measures necessary to safeguard the historic character of a property by defending or guarding it from further deterioration, loss, or attack, or to shield it from danger or injury. In the case of buildings, structures, objects, or landscapes, such treatment is generally of a temporary nature and anticipates future historic preservation treatment; in the case of archeological sites, the measure may be temporary or permanent.

Standards for Protection

1. An analysis of the actual or anticipated threats to the property shall be made prior to applying protective measures.
2. Protection shall safeguard the existing condition of a property from further deterioration or damage caused by natural forces or human activity.
3. If deteriorated or threatened historic materials or features must be removed during the process of protection, they shall be repaired and reused or properly recorded and safely stored until a future treatment is determined.
4. If a distinctive feature no longer performs its function or is vulnerable to vandalism, a suitable protective covering shall be applied until the feature can be repaired or replaced with a new feature that matches the old in design, color, texture, and other visual qualities and, where possible, materials.
5. Invasive vegetation that damages or threatens historic materials and features shall be controlled using the gentlest means possible.
6. A property shall be used for its historic purpose; or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
7. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
8. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties, shall be avoided.
9. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
10. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
11. Deteriorated historic features shall be repaired rather than replaced.
12. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
13. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

STABILIZATION

Stabilization is defined as the act or process of applying measures necessary to reestablish the stability of an unsafe, damaged, or deteriorated property while retaining the essential form as it exists at present.

Standards for Stabilization

1. Stabilization shall reestablish the stability of a property through reinforcement or by arresting material deterioration leading to structural or environmental failure.
2. Stabilization shall be accomplished in such a manner that it does not cause damage to any character-defining features, and in such a way that does not detract from the property's appearance. When reinforcement is required, such work shall be concealed wherever possible, except where concealment would result in the alteration or destruction of the materials, features, or spaces that characterize the historic property.
3. Invasive vegetation that threatens the stability of a structure or landscape feature shall be controlled using the gentlest means possible.
4. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
5. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
6. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.
7. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
8. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
9. Deteriorated historic features shall be repaired rather than replaced.
10. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
11. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

PRESERVATION

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, **integrity**, and material of an historic property. It may include initial stabilization work, where necessary, as well as ongoing maintenance and repair of the historic materials and features.

Standards for **Preservation**

1. Preservation shall retain the existing form, integrity, materials and character-defining features of the historic building, structure, landscape, object, or site, by arresting or retarding the deterioration of a property through a program of ongoing maintenance.
2. Preservation shall manage vegetation change through ongoing maintenance of existing historic plant material, including the removal of invasive or severely **deteriorated** plant material. Replacement of historic plant material, when necessary to preserve the character of the property, shall match the historic appearance, function, and, where possible, species or variety.
3. **A** property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
4. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
5. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding **conjectural** features or historic features from other properties shall be avoided.
6. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
7. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
8. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary or physical evidence.
9. Chemical or physical treatments, such as sandblasting, that cause damage to **historic** materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
10. Significant archeological resources shall be protected and preserved. **I**f such resources must be disturbed, mitigation measures shall be undertaken.

REHABILITATION

Rehabilitation is defined as the act or process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historical and cultural values.

Standards for Rehabilitation

1. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
2. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
3. Construction of historic designs that were never built shall not be undertaken.
- *4. New additions, alterations, or new construction in an historic landscape shall be visually differentiated from the old and shall be compatible with the historic character of the landscape.
- *5. Replacement of missing historic plant material or vegetation features shall be substantiated by documentary or physical evidence. The replacement plant material or features shall match the historic appearance, function, and where possible, species or variety.
6. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
7. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
8. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other properties shall be avoided.
9. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
10. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
11. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary or physical evidence.
12. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
13. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

Note: * These standards may not apply to tax act projects

RESTORATION

Restoration is defined as the act or process of accurately recovering the form, features and details of a property as it appeared at a **particular** period of time by means of the removal of later work or by the replacement of missing earlier work.

Standards for Restoration

1. Restoration shall be undertaken only when there is definitive physical and documentary evidence as a basis for the work and when restoration is essential for understanding and interpreting the value of the property. Restoration work shall be consistent with the period of significance of the historic building, structure, landscape, object, or site.
2. The existing condition of a property to be restored shall be documented prior to the alteration or removal of character-defining features.
3. Restoration shall recognize the **dynamic** nature of landscapes; vegetation that existed during the period of significance shall not be removed, unless removal and replacement is essential to maintain the character of the landscape.
4. Restoration shall replace missing vegetation features by duplicating the historic feature in form, mass, texture, color, function, and other visual qualities, and where possible, species or variety. The new feature shall be based on physical or documentary evidence.
5. A property shall be used for its historic purpose, or shall be placed in a new use that requires minimal change to the defining characteristics of the property and its environment.
6. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a **property** shall be avoided unless it is essential to restore the property to an earlier period.
7. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or historic features from other **properties** shall be avoided.
8. Most **properties** change over time; those changes that occurred within the period of significance shall be retained and preserved.
9. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that represent the period of significance shall be preserved.
10. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary or physical evidence.
11. Chemical or physical **treatments**, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
12. Significant archeological resources shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

Organ Pavilion Traffic
Circulation and Parking Study



RECEIVED
MAY 31 1990
PARK & RECREATION DEPT.
MANAGEMENT DIV.

P&D Technologies
401 W. " A Street
Suite 2500
San Diego, CA 92101
FAX 619/234-3022
619/232-4466

An Ashland Technology
Company

*Planning
Engineering
Transportation
Environmental
Economics
Landscape
Architecture*

May 29, 1990

10259.00

Mr. David Twomey, Assistant Director
Parks and Recreation Department
Balboa Park, Conference Building
M.S. 37
San Diego, CA 92101

Dear Dave:

The following describes the elements completed to date with respect to P&D's effort on the Organ Pavilion Traffic Circulation and Parking Study. The attachments include collected data, field notes and analytical worksheets.

Data Collection/Research

The collection of data necessary for the study is essentially complete. P&D performed the following:

Surveyed parking lots serving the facilities in the vicinity of the Organ Pavilion to establish departure patterns throughout the evening with respect to time and direction, vehicle occupancy ratios, parking space utilization and the picking up of guests adjacent to performance venues.

- Defined characteristics of the parking and circulation system including capacities for all parking facilities, intersection geometrics, roadway cross-sections and vehicle queuing capacity.
- Researched schedule of performance patterns and venue capacities to determine peak summer attendance requirements for parking spaces and the resulting distribution of vehicles to the roadway network during late evening.

Counted turn movements at President's Way and Park Boulevard to determine existing operations of the intersection under evening departure conditions.

The data collected is summarized in the attached material.

Analysis

Based on the above data, evaluation was begun of the parking and network operations projected to occur during summer peak evenings under different circulation scenarios. These scenarios were to analyze the impacts of different capacities for the proposed Organ Pavilion parking structure, different intersection geometrics (President's Way at Park Boulevard) on vehicle queuing and delay and the impact of restricting directional traffic on the Cabrillo Bridge into the Park. The following summarizes the results obtained to date.

Vehicle queuing at President's Way/Park boulevard intersection: The following table summarizes the results concerning operating LOS and vehicle queuing at the subject intersection under different scenarios.

Scenario	LOS	Vehicle Queuing
EXISTING	B	Minimal
<ul style="list-style-type: none">• Existing Parking Facilities• Old Globe/Carter Theaters in operation (winter Saturday) Two-way circulation on roadways Traffic signal control at intersection		
FUTURE		
<ul style="list-style-type: none">• Organ Pavilion Parking Structure-1500 spaces• Summer Saturday (all venues in operation)• Cabrillo Bridge inbound only		
- Traffic signal control at intersection		Excessive delays and queuing
- Free right turn at intersection		Maximum delay 15 minutes, maximum queue length 582 vehicles
- Two free right turn lanes at intersection		Maximum delay 4 minutes, maximum queue length 207 vehicles

Based on projected summer event attendance and departure patterns, and assuming a 1500 space capacity for the Organ Pavilion structure, special operations will be required

Mr. David Twomey
May 29, 1990
Page 3

at the President's Way/Park Boulevard intersection to avoid extensive delays for exiting patrons. At a minimum, these should consist of allowing free right turns from President's Way which will result in maximum delay on the order of 15 minutes. Provision of two free flow right turn lanes would require the addition of a third southbound lane on Park Boulevard and would require some capital improvements in the area. These measures would reduce delays and queuing significantly.

In addition, a preliminary evaluation of the feasibility of the proposed realignment of President's Way around the perimeter of the proposed parking structure was performed. This realignment appears to be feasible on the basis of vertical and horizontal control. Vertical grades on the roadway would be rather steep but are deemed feasible based on expected operating speeds of the vehicles using the facility. Horizontal sight distance at the northeast corner of the structure could be a problem. For this reason, care should be taken in regards to garage access and landscaping in this area.

We would welcome the opportunity to complete this effort when appropriate. If you have any additional questions or comments, please feel free to give me a call.

Sincerely,

P&D TECHNOLOGIES

A handwritten signature in cursive script, appearing to read "Arnold Torma", written in black ink.

Arnold Torma, T.E.
Director of Transportation

AT:kw

cc: E. Wundram

Attachments

TRAFFIC COUNTS

ATTENDANCE DATA

LEVEL OF SERVICE
ANALYSIS



By	Date	Client	Sheet No.	Of
Checked	Date	Job	Job No.	

COLLECTED DATA SUMMARY

EXISTING
 AVAILABLE
PARKING SPACES:

ORGAN PAV. = 456
 ALCAZAR GARD. = 137
 * STARLIGHT = 437
 PAN. AM. PLAZA = 113
 PLAZA DE PANAMA = 292

1435

AVAILABLE SEATS

CASCIOUS CARTER = 300
 OLD GLOBE = 600
 FESTIVAL = 650
 STARLIGHT = 4300

5850

* NOT USED

ATTENDANCE:

SAT. 3/10/90

OLD GLOBE:
 CASCIOUS CARTER:
 (parked = 500)

800

SAT. 7/29/89

OLD GLOBE:
 CASCIOUS CARTER:
 FESTIVAL:
 STARLIGHT:

— 564
 — 192
 — 544 (TYP.)
 — 2500 (TYP.)

756

3800

ORGAN PAV. = 116
 ALCAZAR GARD. = 65
 STARLIGHT = 2
 PAN AM PLAZA = 44
 PLAZA DE PANAMA = 9

236

FUTURE
 AVAILABLE
PARKING SPACES

ORGAN PAV. = 1,000 - 1,500
 ALCAZAR GARD. = 137
 STARLIGHT = 437

1,574 - 2,074

NET CHANGE = 139 - 639

NO. OF CARS PRESENT IN PARKING LOT AT SPECIFIC TIMES

~~CARS LEAVING PARKING LOT~~

	PAN AMERICAN PLAZA (113)	ORGAN PAVILLION (456)	ALCAZAR GARDENS (137)	PLAZA DE PANAMA (292)	STARLIGHT. BOWL (437)
10:00	106 [3]	230 [29]	131 [15]	92 [16]	2 [0]
5	104 [4]	201 [0]	116 [4]	76 [10]	2 [2]
20	103 [10]	201 [24]	112 [16]	66 (11) [10]	4 [0]
15	93 [15]	177 [25]	96 [15]	56 (22) [12]	4 [0]
30	78 [14]	152 [16]	81 [65]	44 (24) [9]	4 [0]
45	34 [11]	36 [4]	16 [5]	35 (24) [2]	2 [0]
0	25	32	11	33 (23)	2
9:30					
9:45					
10:00					
10:15					
10:30					
10:45					
11:00					

(NO. OF PASSENGER & RECREATION VEH. PRESENT)

PARK NOTE

3-3-90 10 PM (SEA)
 2 PLAYS + NA PLAY IN PALISADES

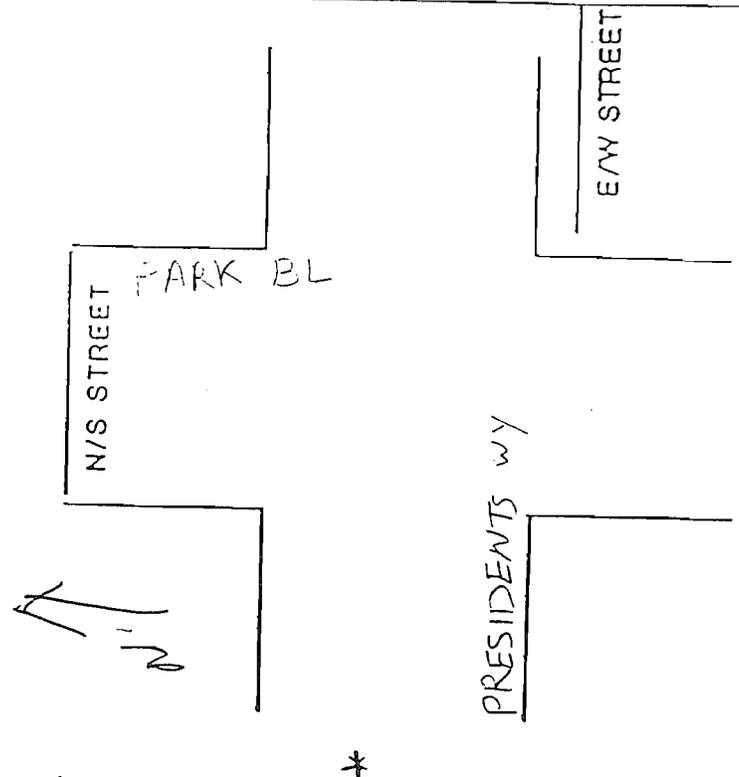
LOT	OCC	REMARKS
NAVY	EMPTY	
AEROSPACE/SL	EMPTY	
PALISADES	2/3	P&R TRUCKS PARKED, NA PLAY
ORGAN PAU.	2/3 TO 3/4	
ALCAZAR	FULL	
PRADO	FULL	
BALBOA DR.	NOM.	
PEPPER GROVE	10%	
FLEET	2/3	CENTER OPEN
BALBOA BLD	3/4	
NAT HISTORY	1/2	
FIG TREE AREA	FULL	
SCAW VILLAGE	1/4	
CAROUSEL	EMPTY	
ZOO	EMPTY	

LONGESTION EXITING TAUNIMAN
 DAYS SOLD OUT

LOCATION PARK BL / PRESIDENTS WY S/D DATE 3-10-99 JOB NO. _____

WEATHER clear ROAD SURFACE _____ OBSERVER M. M. M. M.

TIME STARTS	N/D on		S/D on		E/D on		W/B on		Total	
	R	L	R	L	R	L	R	L	R	L
7:30 7:45	1	30	5	43	14	5	/	/	103	
7:45 10:00		35	6	37	15	18	/	/	113	
10:00 10:15	0	38	5	76	31	11	/	/	163	
10:15 10:30	0	416	4	127	47	10	/	/	241	
10:30 10:45	0	21	6	110	186	21	/	/	351	*
10:45 11:00	0	28	6	51	33	12	/	/	132	
11:00 11:15										
Total	2	198	24	32	326	0	77		1103	
Group	224		476		403				1103	

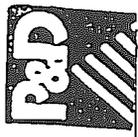


REMARKS: _____

PK.HR:

Total	0	84	28	24	440	0	744	0	84	1404
Group	224		476		403				1103	

- IDENTIFY IN DIAGRAM:
1. Lane, lane width
 2. Parking (PKO) locations
 3. Islands (physical or painted)
 4. Bus stops Δ
 5. Grade





EXISTING CONDITIONS

INTERSECTION CAPACITY UTILIZATION CALCULATION WORKSHEET

Location PARK BLVD @ PRESIDENTS WAY.

Northbound

$$\frac{28}{1500} = 0.02$$

Southbound

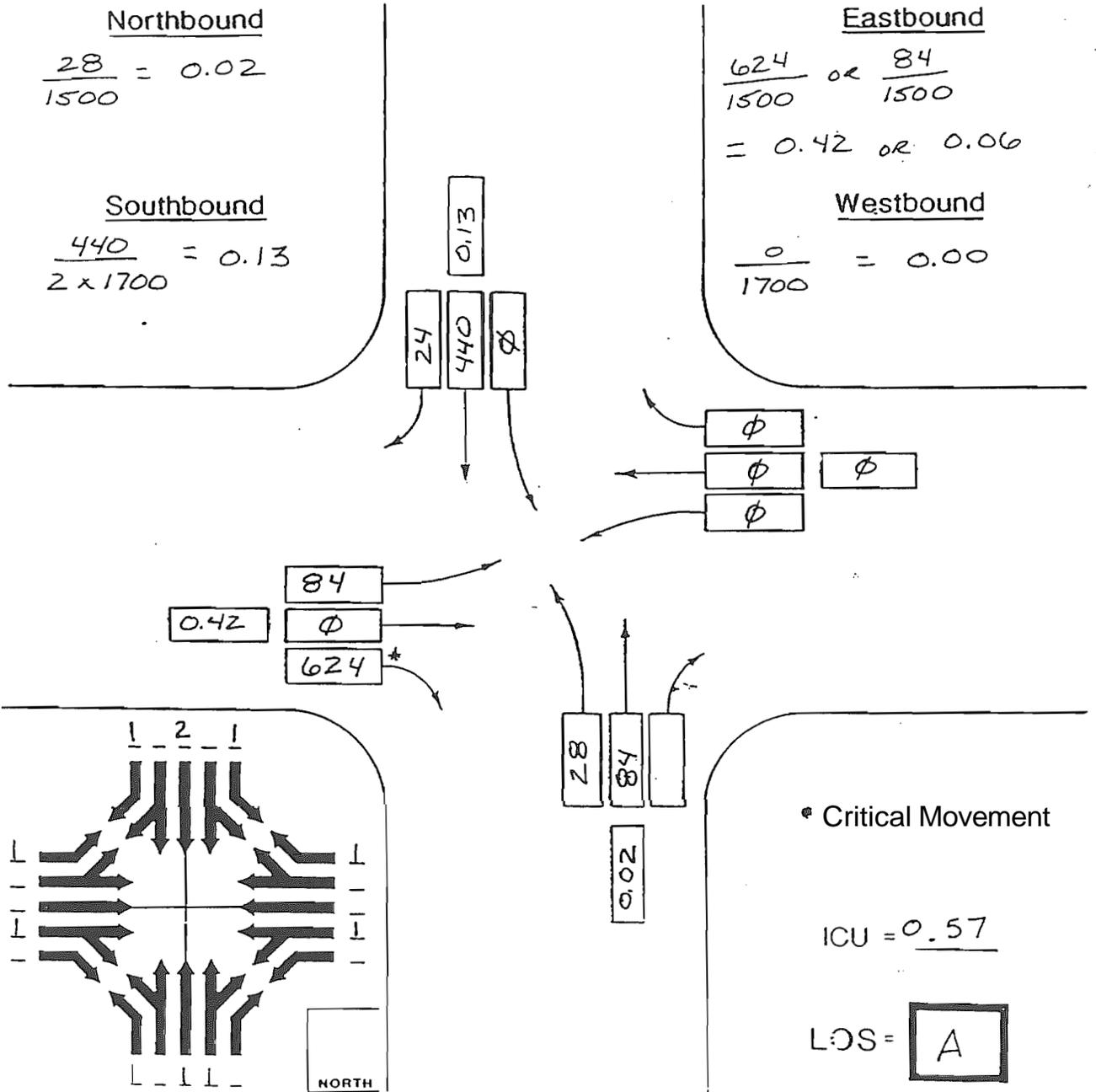
$$\frac{440}{2 \times 1700} = 0.13$$

Eastbound

$$\frac{624}{1500} \text{ or } \frac{84}{1500} = 0.42 \text{ or } 0.06$$

Westbound

$$\frac{0}{1700} = 0.00$$



* Critical Movement

$$ICU = 0.57$$

$$LOS = \boxed{A}$$

REMARKS * 2 VEHICLES PER CYCLE TURN RIGHT, 60 SEC CYCLE

$$(744 - 120 = * 624)$$

Job No. _____

Date _____

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

 INTERSECTION: PRESIDENT'S WAY/PARK BL.
 AREA TYPE: OTHER
 ANALYST: RCS
 DATE: 3/19/90
 TIME: SAT. EVNG. PEAK PER.
 COMMENT: OBSERVED VOLUMES: 3/10/90

	VOLUMES				GEOMETRY							
	WB	NB	SB	EB	L		R		T		R	
LT	84	0	28	0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
TH	0	0	84	440	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
ET	624	0	0	24	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RR	120	0	0	0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0

	ADJUSTMENT FACTORS									
	GRADE (%)	HV (%)	ADJ	PKG Nm	HUSES Nb	F/HF	F/EDS	F/ED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	0.00	N	0	0	1.00	400	Y	28.8	3
WB	0.00	0.00	N	0	0	1.00	400	Y	28.8	3
NB	2.00	0.00	Y	20	4	1.00	200	Y	8.5	3
SB	-2.00	0.00	Y	20	4	1.00	200	Y	8.5	3

SIGNAL SETTINGS										CYCLE LENGTH = 65.0			
		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4		
EB	LT	X				NB	LT	X					
	TH	X					TH		X				
	RT	X					RT		X				
	PD	X					PD		X				
WB	LT	X				SB	LT	X					
	TH	X					TH		X				
	RT	X					RT		X				
	PD	X					PD		X				
GREEN	40.0	0.0	0.0	0.0	GREEN	5.0	10.0	0.0	0.0				
YELLOW	3.0	0.0	0.0	0.0	YELLOW	3.0	4.0	0.0	0.0				

LEVEL OF SERVICE:							
	LANE GRP.	V/C	G/C	DELAY	LO	APP. DELAY	APP. LOS
EB	L	0.076	0.615	3.8	H	6.6	B
	TR	0.690	0.615	7.0	B		
NB	L	0.215	0.077	21.5	L	16.	C
	TR	0.166	0.169	14.9	B		
SB	L	0.000	0.077	0.0	H	19.4	C
	T	0.701	0.169	19.6	C		
	R	0.131	0.169	14.8	B		

INTERSECTION: Delay = 12.8 (sec/veh) v/c 0.659 LOS B

VEHICLE VOLUME SUMMARY - MACHINE COUNT
CITY OF SAN DIEGO TRAFFIC ENGINEERING SECTION

LOCATI : PRESIDENTS HWY (PAK 01-250 W/U) STA 224J FILE NO 0759-09

REG PER .15-MIN PERIODS... (HOUR) DTK WEST .15-MIN PERIODS... (HOUR)
 1200 09 120 70 60 (350) 80 70 50 90 (290) 60 60 50 (250) 50 (250)
 1300 70 60 60 (250) 60 70 70 90 (200) 70 80 90 (310)
 1400 110 80 70 60 (320) 70 100 70 70 (310) 40 40 20 (120)
 2100 30 20 30 10 (90) 10 20 0 20 (50) 0 10 10 0 (20)
 PARTIAL DAY - NO TOTAL

PM PEAK HOUR= 360 ENDING AT 1830

0600	10	10	0	10	(30)	0	10	0	0	(10)	10	0	0	(10)
0700	10	0	0	0	(10)	0	0	0	0	(0)	10	0	10	(20)
** 5 OR MORE CONSECUTIVE ZERO COUNTS. CONSIDER RECOUNT **														
0800	10	20	20	40	(70)	30	40	50	60	(150)	50	40	60	(210)
0900	60	60	50	60	(230)	90	80	60	80	(340)	60	100	70	(320)
1200	90	90	70	70	(320)	60	80	80	90	(310)	70	60	80	(290)
1500	70	90	70	60	(290)	70	90	70	70	(300)	60	70	70	(290)
1800	80	80	50	90	(300)	80	90	70	80	(320)	60	20	30	(150)
2100	20	20	20	10	(70)	10	10	20	10	(50)	10	10	10	(40)
AM PEAK HOUR= 330 ENDING AT 1100														
PM PEAK HOUR= 330 ENDING AT 1945														
TOTAL - 24 HOURS 4,150*														

0600 10 10 0 10 (30) 0 10 0 (10) 10 0 0 (20)
 0700 0 0 0 10 (10) 0 0 0 (0) 0 10 0 (10)
 0800 10 0 20 10 (40) 10 10 0 20 (40) 10 20 20 40 (90)
 0900 70 50 40 60 (220) 50 60 70 100 (200) 70 80 90 70 (310)
 1200 80 90 90 100 (360) 80 60 70 80 (290) 100 70 60 70 (300)
 1500 60 70 90 60 (280) 70 70 60 50 (250) 70 70 50 50 (240)
 1800 60 50 50 70 (230) 80 80 60 60 (300) 60 30 20 30 (140)
 2100 20 20 20 30 (90) 10 10 20 10 (50) 10 10 10 20 (50)
 AM PEAK HOUR= 340 ENDING AT 1145
 PM PEAK HOUR= 360 ENDING AT 1300 1415
 TOTAL - 24 HOURS 3,640*

0600 0 10 10 0 (20) 10 0 0 10 (20) 0 0 0 0 (0)
 0700 10 0 0 0 (10) 0 0 10 0 (10) 0 0 0 0 (10)
 0800 10 0 10 0 (20) 10 0 10 20 (40) 10 20 20 30 (80)
 0900 50 30 40 50 (170) 60 60 70 50 (240) 70 90 100 120 (380)
 1200 110 90 110 140 (450) 140 180 150 160 (630) 160 100 120 80 (460)
 1500 90 80 70 80 (320) 80 60 60 50 (250) 60 40 50 60 (210)
 1800 50 40 60 70 (220) 60 70 60 80 (270) 40 20 10 10 (80)
 2100 10 10 10 0 (30) 10 10 0 10 (30) 0 0 0 0 (0)
 AM PEAK HOUR= 380 ENDING AT 1200
 PM PEAK HOUR= 600 ENDING AT 1415
 TOTAL - 24 HOURS 3,960*

0600 0 0 0 10 (10) 0 0 0 0 (0) 0 0 0 0 (0)
 0700 0 0 0 0 (0) 0 0 0 0 (0) 0 0 0 0 (0)
 0800 0 20 20 40 (80) 30 30 40 60 (160) 40 30 40 50 (160)
 PARTIAL DAY - NO TOTAL
 AVERAGE WEEKDAY COUNT 4,200**



By _____ Date _____ Client _____ Sheet No. _____ Of _____

Checked _____ Date _____ Job _____ Job No. _____

TRAFFIC @ PARK / PRESIDENTS

EASTBOUND APPROACH

SOURCE:	TMC		TOTAL PLE	NORTHBOUND	SOUTHBOUND	RESIDUAL	TOTAL
	SB	NB	EXITS	EXITS	TRUCK	TRUCK	
9:30-9:45	19	10	62	8			62
9:45-10:20	33	7	15	16			33
10:00-10:15	42	7	60	33			60
10:15-10:30	57	11	67	30			67
10:30-10:45	207	13	236	103			236
10:45-11:00	45	8	20	16	47		45



By _____ Date _____ Client _____ Sheet No. _____ Of _____

Checked _____ Date _____ Job _____ Job No. _____

SUMMARY OF DATA COLLECTED 3/10/90

TIME	PRESIDENTS WAY EXIT DIRECTION		
	SOUTHBOUND	NORTHBOUND	TOTAL
9:30 - 9:45 PM	54	8 ¹	62
9:45 - 10:00	0	16	15
10:00 - 10:15	27	33	60
10:15 - 10:30	37	30	67
10:30 - 10:45	133	103	236
10:45 - 11:00 PM	2	18	20



By _____ Date _____ Client _____ Sheet No. _____ Of _____

Checked _____ Date _____ Job _____ Job No. _____

15 MIN. EXIT VOLUMES - PRESIDENTS WAY

	SPRING EXISTING	SUMMER + STARLIGHT + FESTIVAL	WITH ORGAN. PAV. GARAGE SCENARIO 1	SCENARIO 2
9:30 - 9:45	62	279	272	279
9:45 - 10:00	15	68	66	68
10:00 - 10:15	60	270	263	270
10:15 - 10:30	67	302	294	302
10:30 - 10:45	236	1063	1035	1063
jars - 1000	20	90	88	90
	<u>460</u>	<u>2073</u>	<u>2018</u>	<u>2072</u>

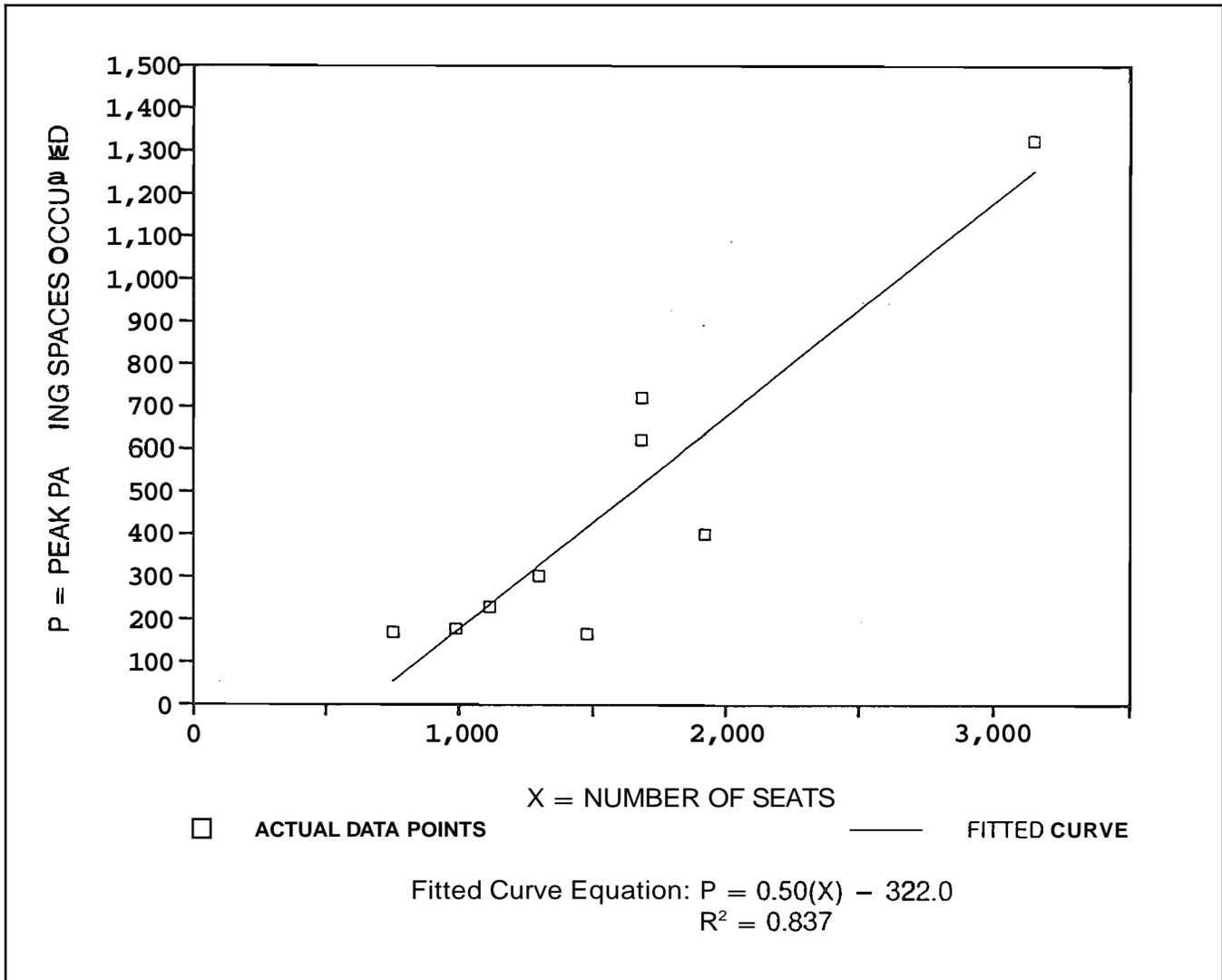
MOVIE THEATER (443)

Peak Parking Spaces Occupied vs: SEATS
On a: SATURDAY

PARKING GENERATION RATES

Average Rate	Range of Rates	Standard Deviation	Number of Studies	Average Number of Seats
0.26	0.11-0.42	0.11	9	1562

DATA PLOT AND EQUATION



HOUSE COUNTS

7/29 Sat eve.

Globe: 564

CARTER: 192

FESTIVAL: 546 (average of all Sat. eves.)

TOTAL 1,302

STARLIGHT 2500 TRP. SAT

QUEUING ANALYSIS



By	Date	Client	Sheet No.	Of
Checked	Date	Job	Job No.	

3/10/90 ; EXISTING

ASSUME 2.5 PASSENGERS PER VEHICLE

~~ITE PLOT~~ PRINC

800 IN ATTENDANCE → NO. SPACES OCCUPIED = $800 / 2.5 = 320$

ACTUAL # SPACES OCCUPIED JUST PRIOR TO PEAK 15 MIN EXIT = 359

SPACES OCCUPIED BY VEHICLES OTHER THAN PLAYS = $359 - 320 = 39$

FUTURE :

ITE PLOT

3800 IN ATTENDANCE → NO. SPACES = $0.5(3800) - 322 = 1578$

ACTUAL SPACES TO BE OCCUPIED JUST PRIOR TO PEAK EXIT = $1578 + 39 = 1617$

SCENARIO 1 - ORGAN PAVILLION GARAGE HAS 1000 SPACES

- ASSUMPTIONS:
1. ALL PLAYS ARE RUNNING INCLUDING STARLIGHT
 2. PEAK 15 MIN EXITING VOLUMES FOLLOW SAME TIME PATTERN AS OBSERVED ON 3/10/90.
 3. OVERFLOW VEHICLES WILL PARK IN NAVY LOTS.

TOTAL SPACES AVAILABLE WEST OF PARK BL. = 1574

CARS PARKED ON WEST SIDE OF PARK = 1574

CARS PARKED ON EAST SIDE OF PARK (NAVY) = $1617 - 1574 = 43$

SCENARIO 2 - ORGAN PAVILLION GARAGE HAS 1500 SPACES

ASSUMPTIONS: SAME AS SCENARIO 1

TOTAL SPACES AVAILABLE WEST OF PARK BL. = 2074

CARS PARKED ON WEST SIDE OF PARK = 1617

CARS PARKED ON EAST SIDE OF PARK = 0

FROM EXISTING: 236 TOTAL VEHICLES LEFT BETWEEN 10:30-10:45 AM
 $236 / 359 = 66\%$

FOR FUTURE: EXPECT 66% OF 1459 WILL LEAVE BETWEEN 10:30-10:45 AM
 = 1227

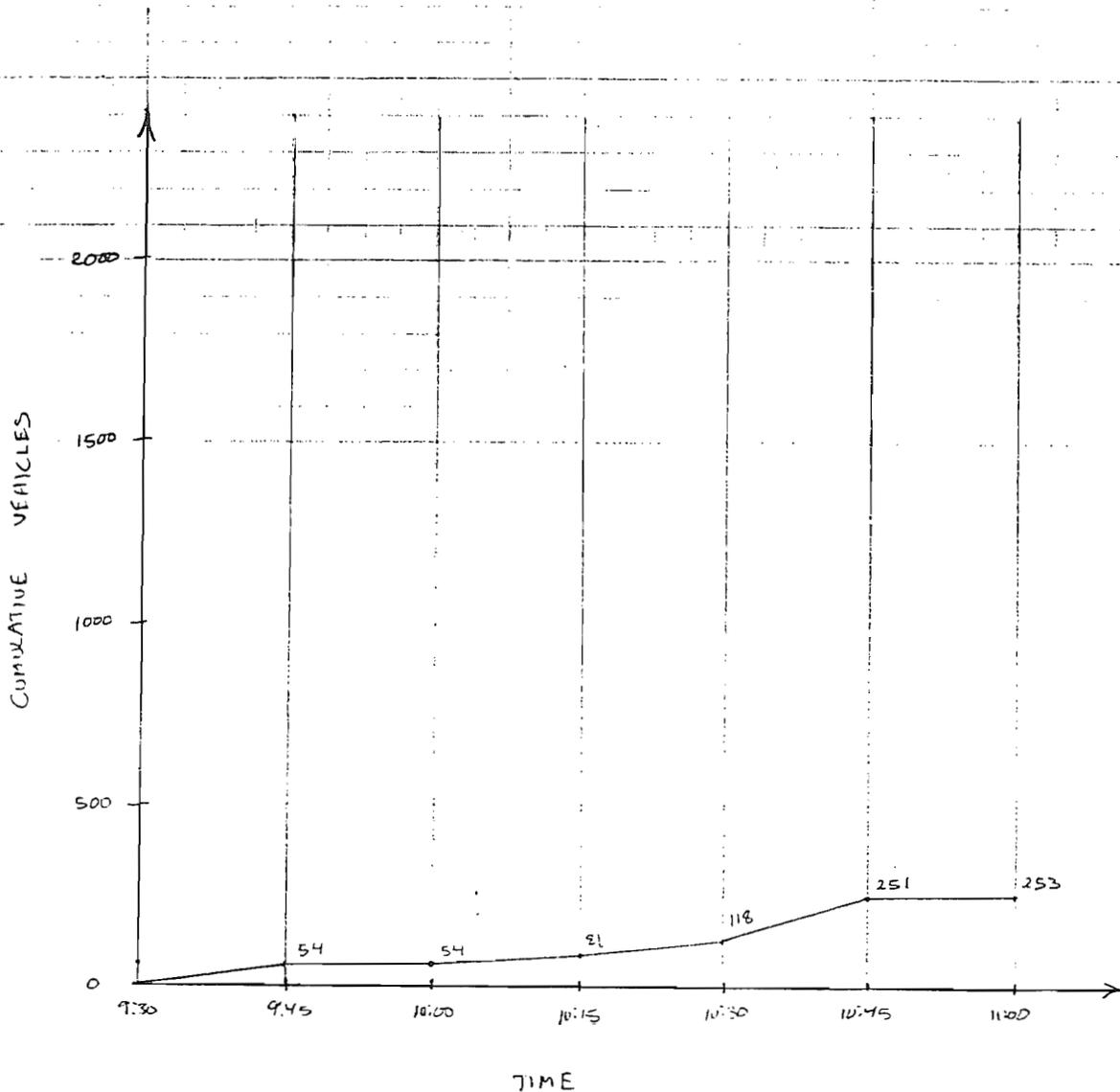


By _____ Date _____ Client _____ Sheet No. _____ Of _____

Checked _____ Date _____ Job _____ Job No. _____

EXISTING: AS COUNTED 3/10/90

ASSUMPTIONS: 1. T.S. @ PRESIDENTS & PARK OPERATING AS FULLY ACTUATED.
 2. EB STRIPING IS

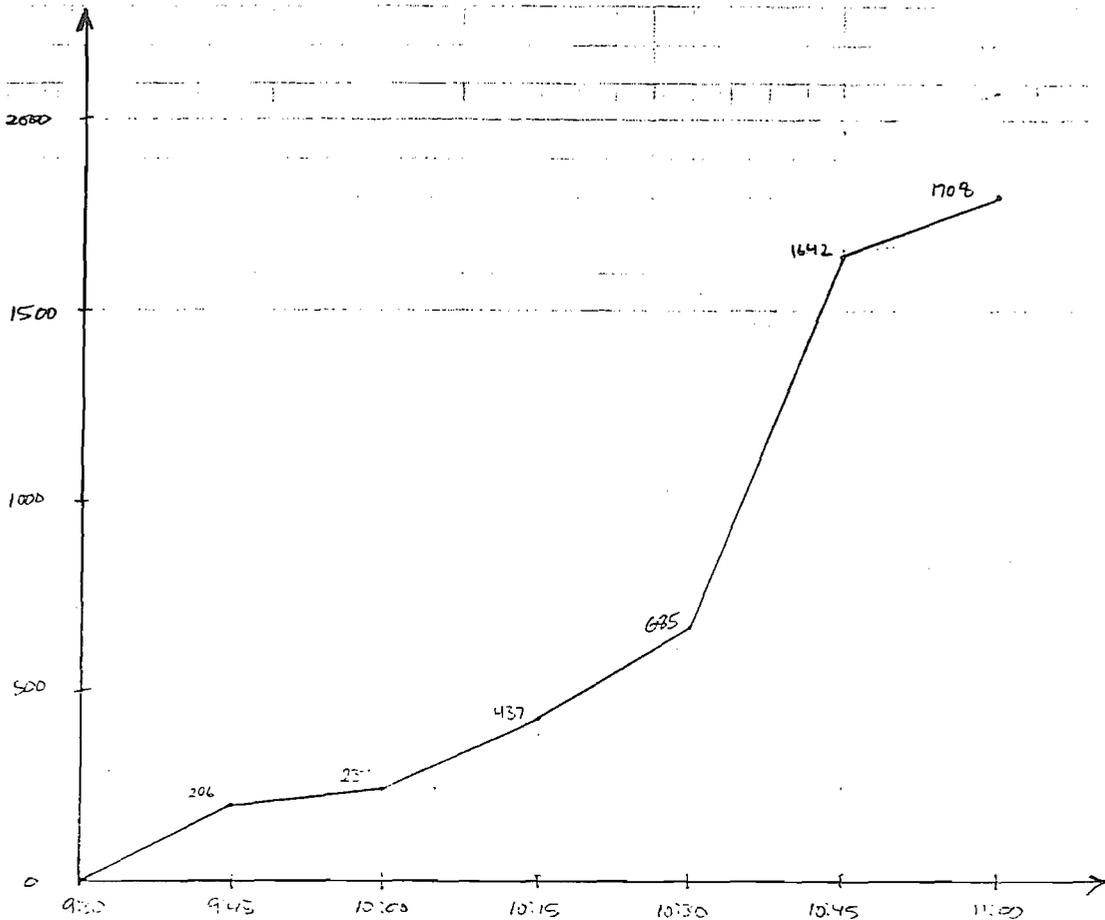




By	Date	Client	Sheet No.	Of
Checked	Date	Job	Job No.	

FUTURE : SCENARIO 2

- ASSUMPTIONS :
1. T.S. 2 PRESIDENTS & PARK OPERATING AT FULLY ACTUATED.
 2. EB STRIPING IS
 3. ALL EXISTING TRAFFIC ARRIVES AT PRESIDENTS / PARK INTERSECTION
 4. ALL PLAYS ARE RUNNING
 5. FUTURE NUMBERS BASED ON INCREASED PLAY ACTIVITY (i.e FESTIVAL & STARLIGHT) WHILE OTHER PARKING ACTIVITY IS HELD CONSTANT WITH EXISTING
 6. PATTERN OF PEAK EXIT PERIODS IS SAME AS EXISTING.





By	Date	Client	Sheet No.	Of
Checked	Date	Job	Job No.	

FIGURE : SCENARIO 2

- ASSUMPTIONS :
1. I.S.
 2. PRESIDENTE & PARK OPERATING AS FULLY AVAILABLE.
 3. RR STRIPING IS
 3. ALL EXISTING TRAFFIC ARRIVES AT PRESIDENTE/PARK INTERSECTION
 4. ALL PLAYS ARE RUNNING
 5. FUTURE NUMBERS BASED ON INCREASED PLAY ACTIVITY (i.e. FESTIVAL & STARKLING) WHILE OTHER PARKING ACTIVITY IS HELD CONSTANT WITH EXISTING
 6. PATTERN OF PEAK EXIT PERIODS IS SAME AS EXISTING.

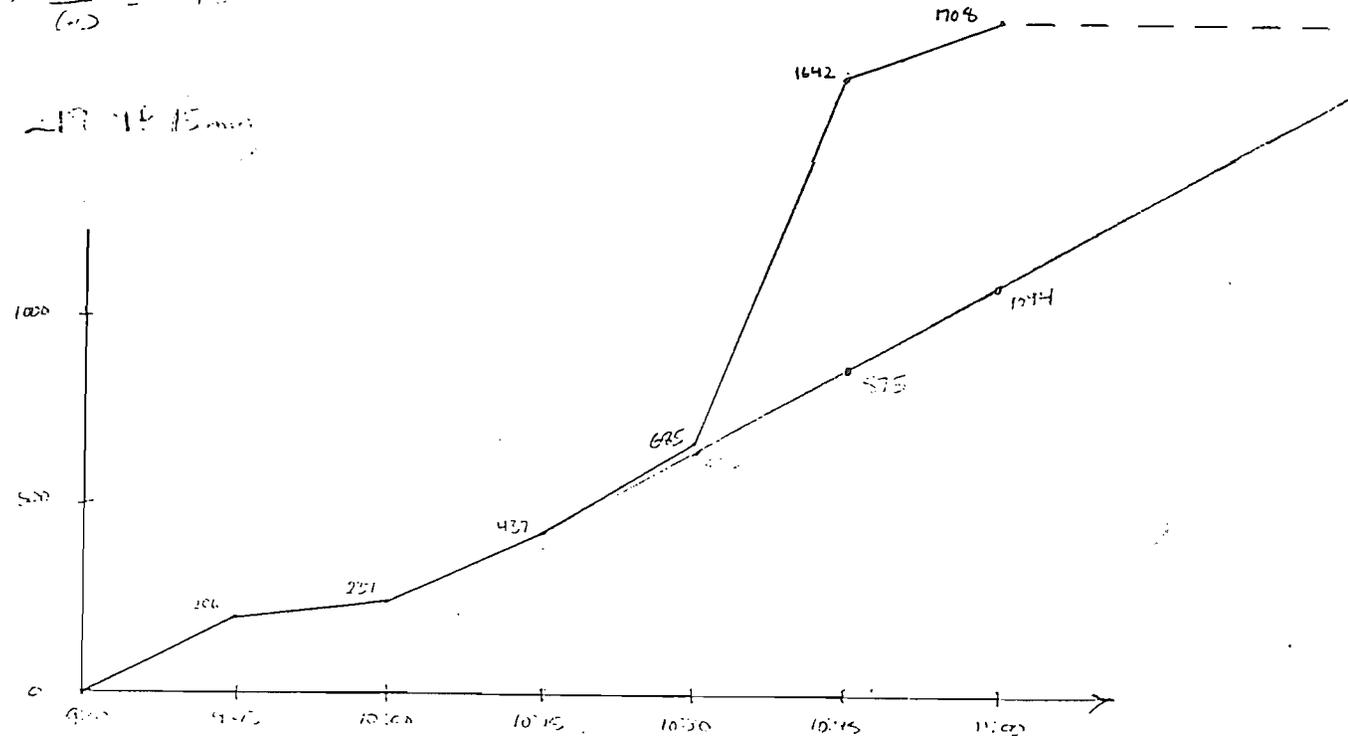
RT. LINE CAP. **NOT FEASIBLE!**

1500 VPH

$\frac{35 \text{ min}}{\text{HR}}$ of Green time

$$AD = 1500 \times \frac{35}{60} = 875 \text{ VPH}$$

$$\rightarrow \frac{875}{4} = 218.75 \text{ lanes}$$





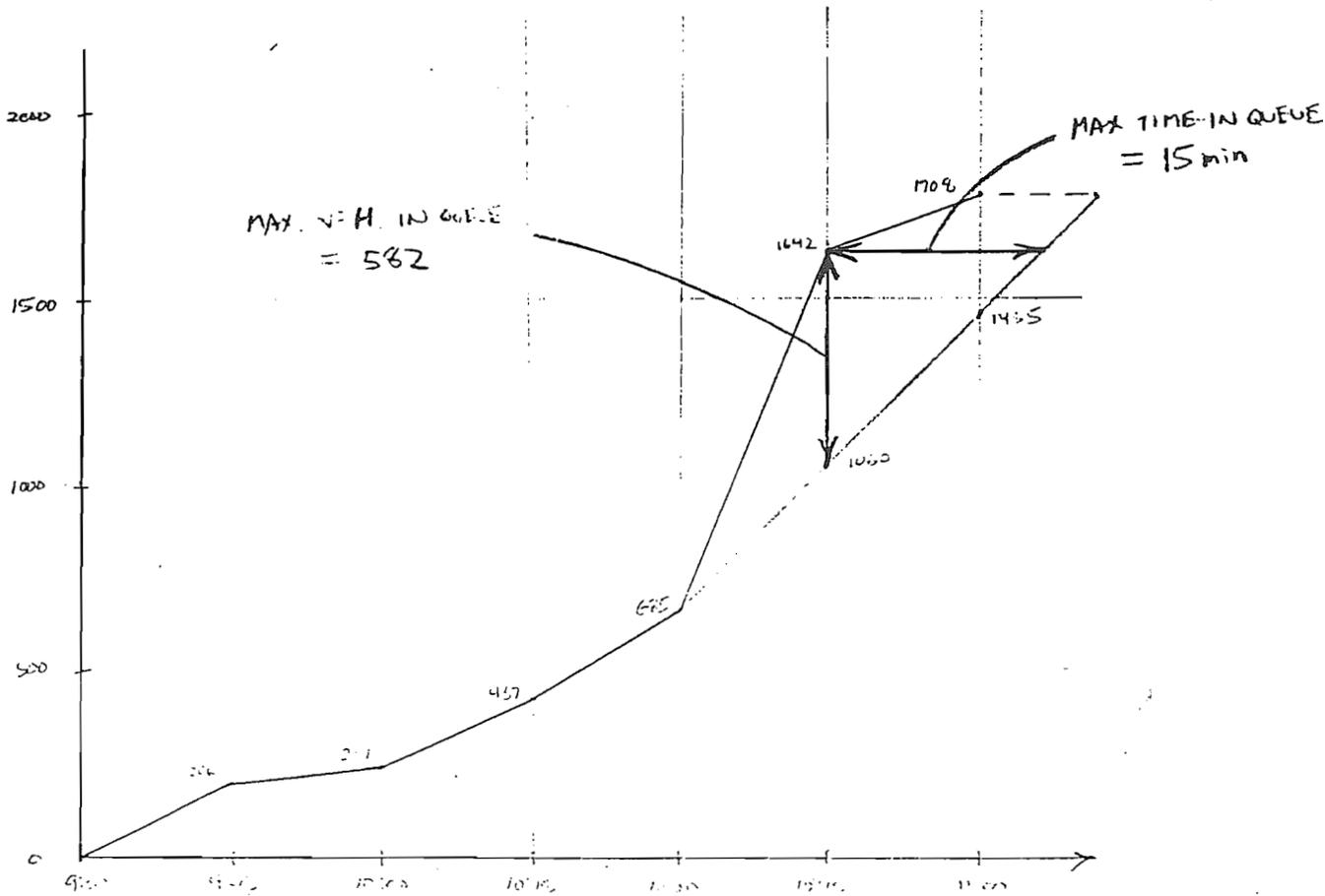
By	Date	Client	Sheet No.	Of
Checked	Date	Job	Job No.	

FUTURE : SCENARIO 2

- ASSUMPTIONS :
1. IS 2 PHASE & PARK OPERATING AS LANE ADJACENT.
 2. EB STRIPING IS
 3. ALL EXISTING TRAFFIC ARRIVES AT PRESIDENTE/PARK INTERSECTION
 4. ALL PLAYS ARE RUNNING
 5. FUTURE NUMBERS BASED ON INCREASED PLAY ACTIVITY (i.e. FESTIVAL & STARLIGHT) WHILE OTHER PARKING ACTIVITY IS HELD CONSTANT WITH EXISTING
 6. PATTERN OF PEAK EXIT BEHAVIOR IS SAME AS EXISTING.

RT LANE CAP (F.P.)

$1500 \text{ VPH} = \frac{1500}{4} = 375 \text{ VPL}$





By _____ Date _____ Client _____ Sheet No. _____ Of _____

Checked _____ Date _____ Job _____ Job No. _____

FUTURE : SCENARIO 2

ASSUMPTIONS :

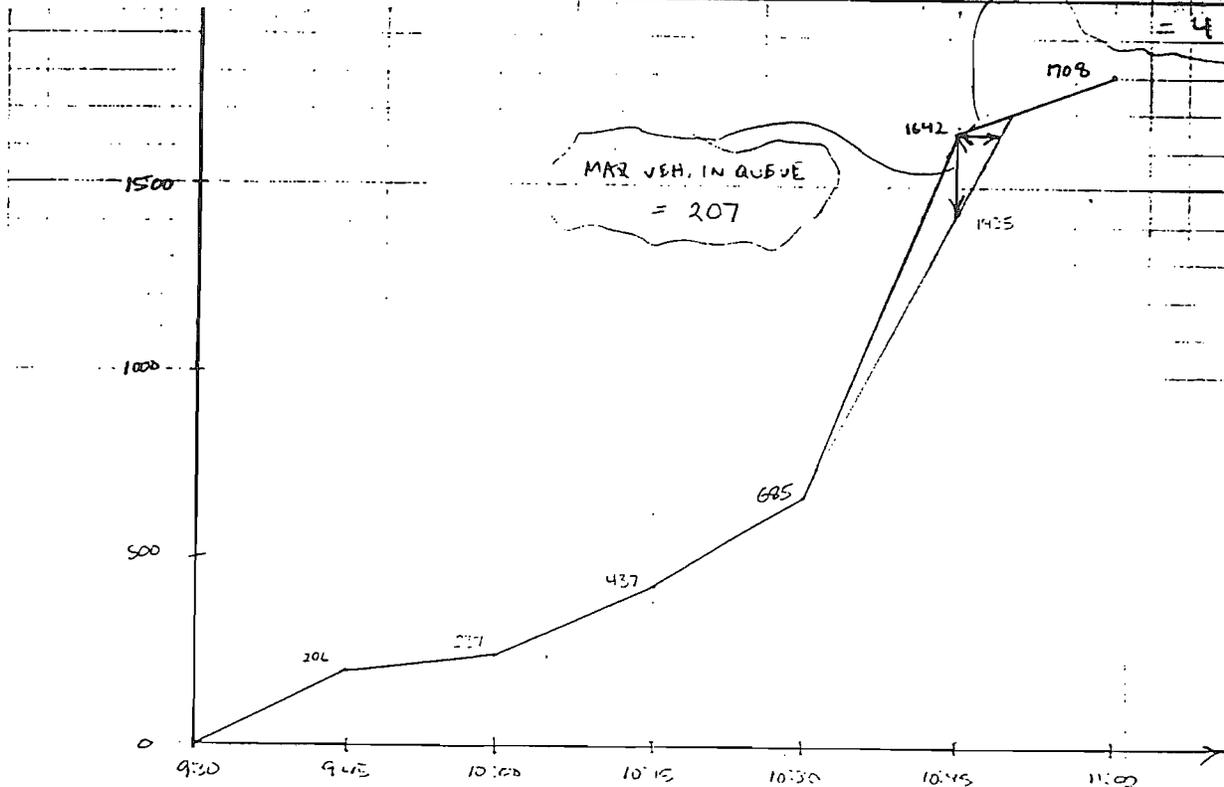
1. T.S. 2 PRESIDENTS & PARK OPERATING AS FULLY ACTUATED.
2. EB STRIPING IS \rightarrow
 \leftarrow
3. ALL EXISTING TRAFFIC ARRIVES AT PRESIDENTS/PARK INTERSECTION
4. ALL PLAYS ARE RUNNING
5. FUTURE NUMBERS BASED ON INCREASED PLAY ACTIVITY (i.e. FESTIVAL & STARLIGHT)
WHILE OTHER PARKING ACTIVITY IS HELD CONSTANT WITH EXISTING
6. PATTERN OF PEAK EXIT PERIODS IS SAME AS EXISTING.

RT. LANE CAP

2 FREE EXIT LANE

CAP = 3000 VPH

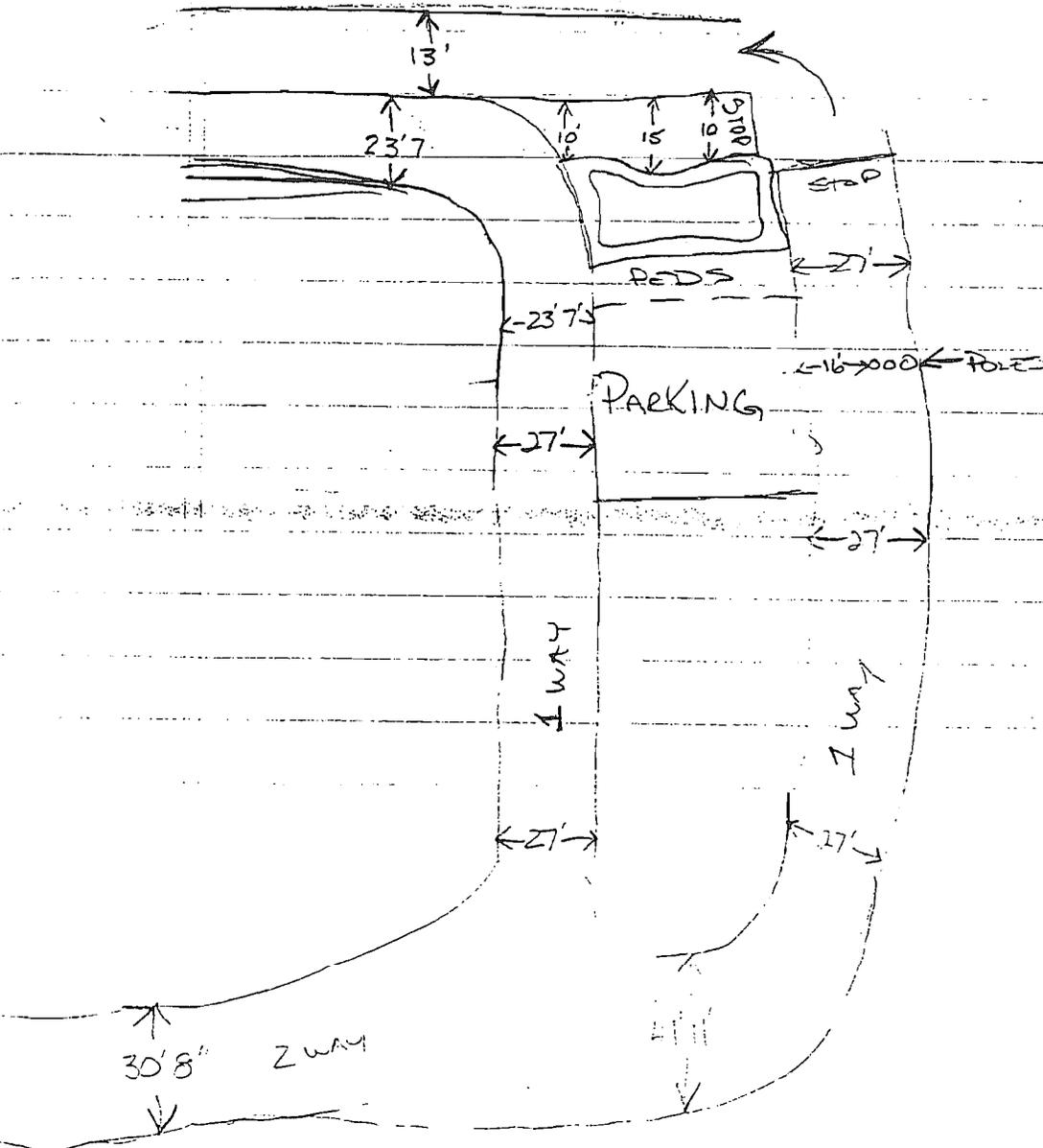
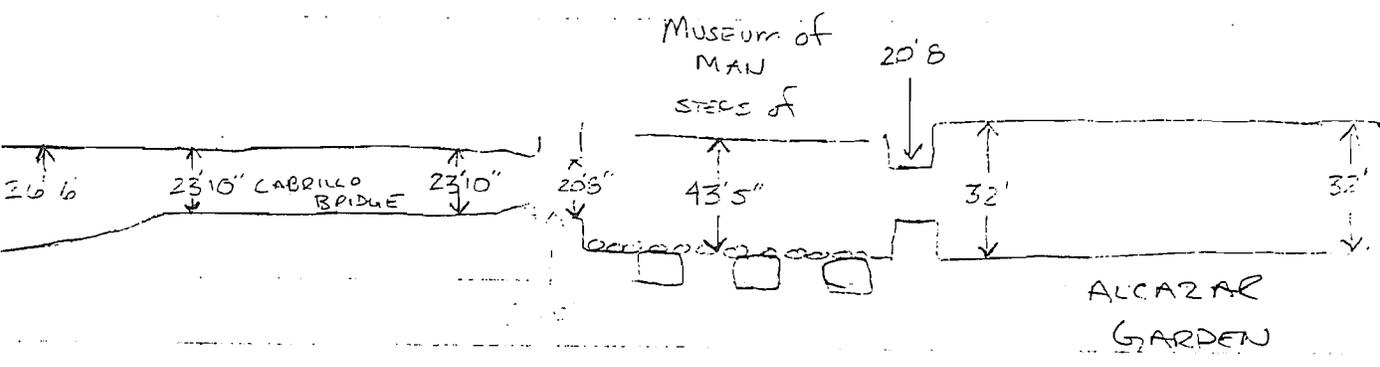
$-\frac{3000}{4} = 750$



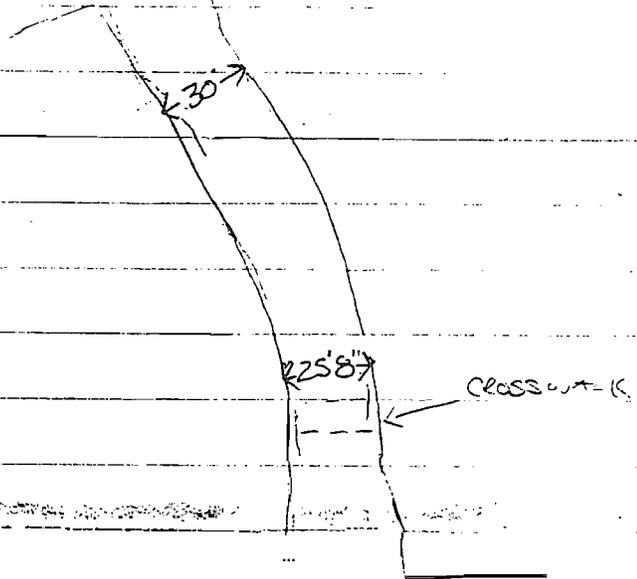
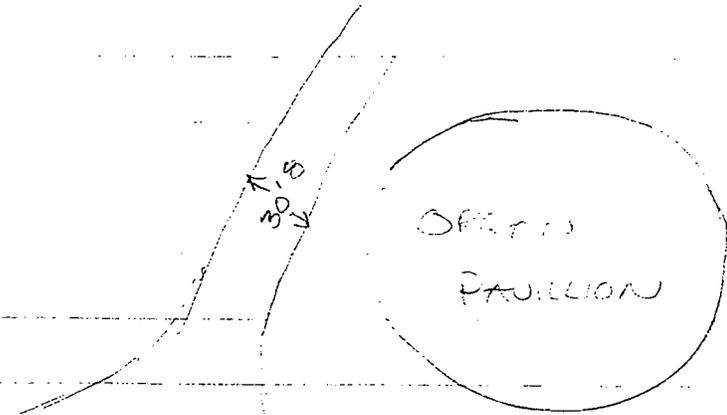
FIELD MEASUREMENTS

BOLBOA PARK (DIMENSIONS)

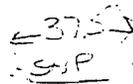
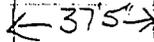
3/7/90
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 MUSEUM OF
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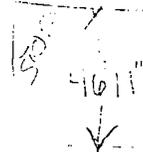
PAVILLION

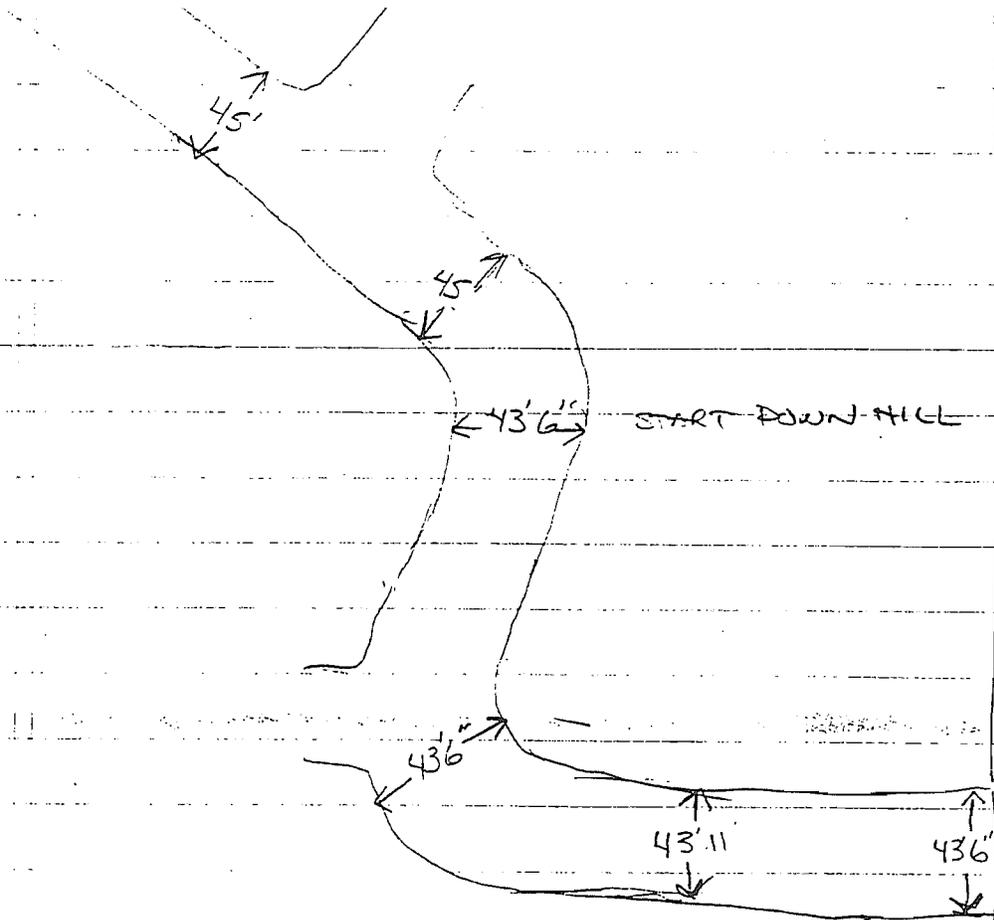


PARKING LOT



PAVING





PARK BLVD.

UPHILL WIGNS TO
43'11"

PARKING STRUCTURE NOTES



By RCS Date 3/14/90 Client EDWARD WUNDRAM

Sheet No. 1 of 1

Checked

Date

Job BALBOA PARK STRUCTURE Job No. 93333.00

SUMMARY OF PARKING STRUCTURE DESIGN GUIDELINES

ENTRANCE/EXIT LANES

CAPACITY:

- ENTRANCE (WITH GATE CONTROL) = 400 vph
- EXIT (WITH GATE CONTROL) = 200 vph

* NOTE: SURGE TYPE FACILITIES SHOULD BE ABLE TO EMPTY IN 30 MIN.
 ALL OTHER TYPES, 1 HOUR.

NUMBER OF LANES REQUIRED:

- ENTRANCE = 1 LANE PER 600 PARKING SPACES (SHORT TERM PARKING)
- EXIT = 1 LANE PER 250 PARKING SPACES (SHORT TERM PARKING)

* RULE OF THUMB: 2 EXIT LANES FOR EVERY ENTRANCE LANE.

* TIP: USE REVERSIBLE LANES FOR SURGE TYPE PARKING

QUEING AREAS:

- FREE FLOW = 1 CAR LENGTH (19') PER ENTRANCE LANE
- TICKET DISPENSER = 2 CAR LENGTHS (38') PER ENTRANCE LANE
- CASHIER = 8 CAR LENGTHS (152') PER ENTRANCE LANE

DRIVEWAY DIMENSIONS (PEDESTRIAN CONSIDERATIONS):

	HIGH PED.	
	ACTIVITY	ALL OTHERS
<u>WIDTH:</u>		
MINIMUM (ONE-WAY)	15'	15'
MINIMUM (TWO-WAY)	25'	25'
MAXIMUM	30'	35'
<u>RIGHT-TURN RADIUS:</u>		
MINIMUM	5'	10'
MAXIMUM	10'	30'
<u>SPACING:</u>		
FROM PROPERTY LINE	0'	0'
FROM STREET CORNER	10'	10'
BETWEEN DRIVEWAYS	10'	0'

INTRODUCTION

TABLE I—SUMMARY OF SUGGESTED PARKING GARAGE
DESIGN PARAMETERS

Structure Size

Most desirable is a parking structure with 500 to 2,500 parking spaces, scaled to the capacity of adjacent street access.

Structure height may be limited by local building codes as well as interfloor circulation constraints. Generally maximum parking structure heights range between 5 and 9 levels (60 to 90 feet) with up to 30,000 square feet of floor area per parking level.

Location Guidelines

Accessibility is a principal factor in parking garage location. Parking garages exceeding approximately 1,200 spaces should have nearby or direct freeway access.

Acceptable walking distance between parking place and destination is another key location factor, and is influenced by population size and trip purpose. Guidelines for maximum walking distance are: For larger cities (over 250,000 population)

Long-term parking— 1,000 to 1,500 feet

Short-term parking— 500 to 800 feet

For smaller cities (under 250,000 population)

Long-term parking— 600 to 700 feet

Short-term parking— 200 to 350 feet

Entrance/Exit Lanes

Generally a parking garage should be able to fill or completely discharge within a maximum of 1 hour. Special-event surge-type demand facilities should be capable of emptying in 30 minutes.

Maximum lane capacities for parking garage entrances range up to 660 vehicles per hour; for controlled entrance lanes, 400 vehicles per hour per lane is commonly used as a maximum design capacity. Discharge capacities range between 150 and 225 vehicles per hour for each gate-controlled exit lane. General requirements for number of access lanes and reservoir area are:

Entrance lanes

Short-term parking, 1 per 600 spaces

Long-term parking, 1 per 500 spaces

Exit lanes

Short-term parking, 1 per 250 spaces

Long-term parking, 1 per 200 spaces

Inbound reservoir area

Free-flow entry, 1 space per entry lane

Ticket-dispenser entry, 2 spaces per entry lane

Entrance cashiering, 8 spaces per entry lane

Attendant parking, 10 percent of parking capacity served by each entry lane.

(continued)

TABLE I—(continued)

Parking Dimensions

Parking stalls

Minimum stall widths for self-park operations are 8.5 feet for angle parking and 9.0 feet for 90-degree parking; for attendant-park operations, stall widths range from 8.0 to 8.5 feet. Minimum stall length is 18 feet. Special compact-car stalls are standardized at 7.5 feet wide by 15 feet long.

Aisle width

Minimum widths for one-way aisles range from 11 to 12.5 feet; two-way aisles, from 20 to 22 feet.

Column spacing

Traditionally, columns have been spaced at intervals of three parkingspaces. This results in a 28.5-foot spacing, assuming 90-degree parking and 18-inch columns. Because columns are located 3 feet in from aisles, a parking bay or module of 62 feet requires an over-all minimum column spacing of 31 by 28.5 feet. Larger columns, angle parking, and/or more stalls between columns requires spacing to be increased accordingly to maintain adequate clearances.

Clear-span design

Column-free designs may provide structural support spans from 48 to 65 feet.

Floor heights

Minimum clear height is 7.0 feet; however 7.5 feet is most desirable, which provides a 9.6 to 10-foot floor-to-floor height.

Other Considerations

Ramp grades

A maximum grade of 4 percent should be used for sloped portions of sloping floor garages where ramps provide direct access to stalls. Where conventional interfloor ramps are used (either straight or helical), grades should not exceed 15 percent; grades of 7 to 8 percent are preferable.

Lighting intensity

Garage illumination should approximate 2 to 5 footcandles along straight aisles and in parking areas, 50 footcandles immediately inside entrance and exits, 15 footcandles in areas where drivers are expected to turn, and 20 to 50 footcandles in cashiering and waiting areas, and other pedestrian areas.

Passenger elevators

Recommended for parking structures of 3 or more floors. Needs can be generally equated to the number of parking stalls: two elevators for the first 600 stalls and one extra elevator for each additional 600 stalls or substantial fraction thereof.

lished by parking studies. However, many areas of greatest parking need may be economically impractical parking locations because of site costs or lack of convenient access. A project's economic practicality may be improved, in some instances, through sharing land and development cost with other land uses. Such joint use also provides continuity for pedestrian movements and minimizes land fragmentation.

Parking facility usefulness can be improved by location and design considerations that permit daytime and nighttime use, and provide for differing usage characteristics of these different time demands. For example, daytime parking may be business oriented while nighttime parking is mainly for recreational or cultural purposes.

Accessibility

Accessibility to parking sites for both vehicles and pedestrians is an important aspect of site selection.

Pedestrian Access. Pedestrian considerations are critically important to site selection and parking development. Ideal sites are those within short walking distance of parkers' destinations. Maximum walking distances of 1,000 to 1,500 feet (305 to 457 meters) for work trips, and 500 to 800 feet (152 to 244 meters) for shoppers, represent desirable guidelines for large cities.¹² For smaller cities, maximum desirable walking distances are 600 to 700 feet (183 to 213 meters) for work trips, and 200 to 350 feet (70 to 107 meters) for shoppers.

For pedestrian access to be safe and convenient, it should be restricted to designated points, with informal pathways for random access prevented. Restricting pedestrian access to prescribed points may conflict with convenience considerations, but is necessary for safe operation, minimizing pedestrian-automobile conflicts, and for security reasons stemming from unauthorized and/or undetected access. Designated points of pedestrian access at parking locations further serve to direct unfamiliar users to their intended destination along the safest and most convenient route.

Pedestrian access is improved when sites can allow direct connections to major generators via bridge or tunnel, avoiding vehicular traffic crossings. Enclosed pedestrian overpasses offer weather

¹² Herbert S. Levinson and Edward M. Whitlock, "Economic and Environmental Considerations in Parking and Design" (Paper presented at American Society of Civil Engineers Annual and National Environmental Convention, Kansas City, Missouri, October 25, 1974) p. 7.

protection and—whether covered or not—are generally preferred over tunnels for security reasons. Overlighting and unrestricted sight distances add to actual and perceived security of pedestrian-users.

Walking distances can be psychologically enhanced if they are designed to route pedestrians along commercial frontages having display windows. Cantilevered structure appurtenances over sidewalks, landscape plantings, informational and directional signing, or other amenities such as time and temperature displays, make walking more pleasant.

While hilly terrain may leave few alternatives, steep hillside locations are undesirable from the standpoint of pedestrian convenience. Where such grade differences are unavoidable, parking sites located *uphill* from major trip generators should be favored, since pedestrians are psychologically more influenced by the perceived walking trip to the generator than by the return trip. However, hillside locations may offer unique means for vehicular access to different parking garage levels, not requiring interfloor ramp travel.

Pedestrian access points should preferably be located on the parking facility side nearest the major generator(s), providing

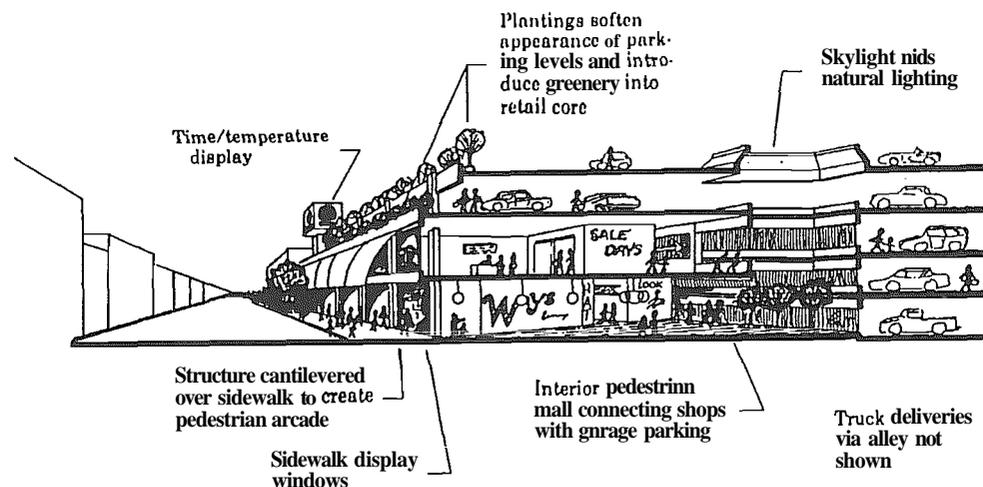


FIGURE 6. A multiple-use design concept for downtown offering efficient foot-traffic patterns in semi-malled and weather-controlled galleries connecting multi-level commercial space with structure parking.

pedestrians visual contact with generators and routing them over the shortest possible distance. Unsafe alternative routes should be discouraged by use of barriers or other disincentives (landscaping, fencing, architectural facades, signing). While barriers may be necessary to direct safe pedestrian travel, they should not be designed in such a way as to provide hiding places, or restrict sight distances and lighting.

Existing at-grade pedestrian street crossing facilities and controls surrounding potential parking sites should be examined, and changes warranted by the addition of a parking operation should be anticipated. Nearby intersections may require traffic signalization, or rephasing of existing signal controls, for increased pedestrian movements. Midblock pedestrian crossings may be justified, or street type and traffic conditions might be such as to preclude at-grade pedestrian crossings altogether. Upgraded street lighting may also be required.

Vehicular Accessibility. Site selection and facility design must recognize vehicular interchange between a parking facility and the street system as of major importance to user, operator, and the community. From these differing perspectives, vehicular access considerations may face conflicting objectives. Parkers will desire convenience and undelayed ingress and egress. Operators will be concerned with the street system's ability to accommodate entering and exiting traffic. The general community will be concerned about traffic routing impacts, back-ups onto city streets, and pedestrian safety. It is important that these objectives be attained, and conflicts minimized as much as possible.

Ideally, sites should be located to minimize cruising by motorists in search of a suitable parking space. A site requiring motorists to travel on side streets to enter a parking facility may be suitable for workers, familiar with the location and routing, but is not convenient for transient parkers entering the area. Nor may it be acceptable to residents and property owners along the side streets, because of increased traffic flows.

Design and capacity analysis should view a parking site and its surrounding streets as a *system*. Directional traffic approaches to the influence area, and traffic conditions and controls on adjacent streets, are critical considerations to both site selection and facility design. Precise routing from major arterials and freeways to potential parking sites must be examined in regard to probable traffic impacts of future development. Introduction of a parking facility may complicate traffic patterns, requiring one-way street systems or other means to reduce driving times and improve accessibility.

Sites offering access from different streets, such as corner locations, can be advantageous for parking facilities if entrances and exits can be located without intersection interference. However, corner sites are desirable for retail development and often command a higher land cost.

A site's ability to offer well-located street access points may be determined by answers to such key questions as:

1. Will traffic queues from nearby intersections extend across potential entrance or exit points?
2. Are there already traffic queues on site approaches?
3. Can all access to and from two-way streets be via right turns?
4. Can streets be widened to provide adequate storage space for queued vehicles?

Facility size should be scaled to the ability of adjacent streets to accommodate parking facility traffic. This suggests a range from

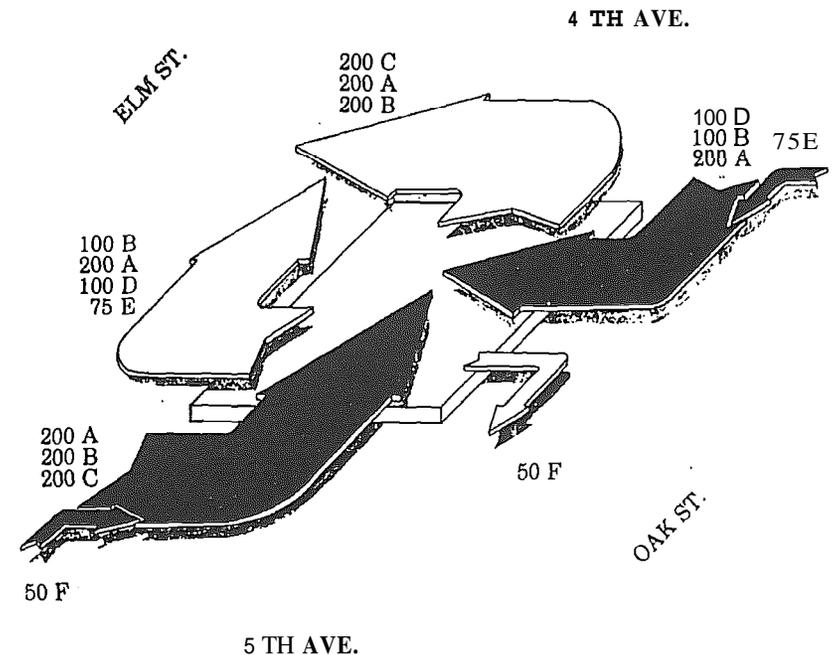


FIGURE 7. Potential traffic movements into and out of a proposed garage can be determined if the destinations of potential parkers are obtained on a relatively accurate location basis (such as a block face) and give some indication of time of arrival and duration of stay.

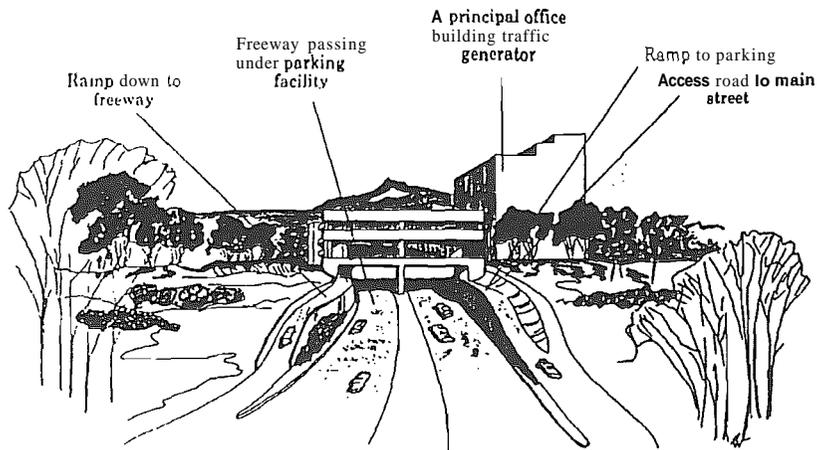


FIGURE 8. Structure parking with direct freeway access.

Note: This parking plan is being developed as a four-level garage to accommodate 1,000 cars in Tulsa, Oklahoma.

Source: Hudgins, Thompson, Ball, and Associates, architects and engineers of Tulsa and Oklahoma City, Oklahoma.

approximately 500 to 2,500 spaces. Parking garages exceeding 1,200 spaces should be located for nearby or direct freeway access.¹³

The ideal movement into an off-street parking facility is a straight approach, requiring no on-street turning movement. A left turn from a one-way street into a parking facility is also desirable, because a driver using the inside lane for a left turn has better visibility and can make more accurate vehicle maneuvering judgments.

Site access from high-volume two-way streets may require left-turn restrictions on entering and exiting parking facility traffic, special left-turn lanes at mid-block entrance locations, or access separated from adjacent street traffic. When entrances and exits are separated, entrances should be placed in the upstream traffic portion of the block, and exits should be located in the downstream portion of the block. Side-by-side entry and exit points should preferably be located at mid-block.

Environmental design for minimizing air pollution from traffic congestion requires sufficient entrance and exit capacity. As a general guideline, one inbound lane should be provided for every

¹³Ibid., p. 8.

500 spaces in a garage serving long-term employee parking, and for every 600 spaces in garages serving short-term shopper parking. One outbound exit lane should be provided for every 200 spaces in an employee garage, and for every 250 spaces in a shopper garage.¹⁴

Parking facility entrances should be clearly visible to drivers along approach streets. Whether the facility itself should be unmistakably visible as a parking facility is subject to considerations discussed later. Sidewalk pedestrian circulation requirements should be recognized where multi-lane access points may be required. In some cases, this may limit width of the access points.

Additional design parameters for vehicular access and pedestrian circulation are discussed in Chapters IV and VI.

Site Efficiency

The size, shape, and often the topography, of a site influence parking layout efficiency. Site efficiency may also depend on a site's ability to accommodate multiple-use development.

Site Size and Shape. Rectangular sites generally provide the best shape, since parking structures usually have rectangular floor plans. Although irregular-shaped sites are generally avoided, they can be suitable for helically-shaped parking ramps, serving circular floor plans. For parking structures, odd-shaped sites may offer opportunities to develop either ingress or egress ramps outside the basic structure envelope, or special access to streets.

Site topography may permit direct street access between different parking levels.

Site width is particularly important to parking layout efficiency. Design alternatives and space-use efficiency are seriously impaired with site widths less than 120 feet (37 meters). Site widths between 95 and 120 feet (29 and 37 meters) can be used for parking structures, but require angle parking and severely limit alternative parking layouts and interfloor ramp systems. Site widths between 120 and 200 feet (37 and 61 meters) can accommodate several different floor layouts, parking angles, and interfloor ramp designs, providing alternatives from which to select the most cost-effective and space-efficient design.

Site length is relevant to both space-use efficiency and operational efficiency. Longer sites permit more space-efficient develop-

¹⁴Highway Research Board, *Parking Principles*; and Levinson and Whitlock, "Economic and Environmental Considerations in Parking and Design," p. 8.

ment of parking stalls along access aisles parallel to the site's long dimensions. This is because there are more stalls on which to prorate unusable floor space located at structure corners.

However, as aisle lengths increase as a result of available site length, inefficiencies may develop in traffic operation caused by excessive travel length and increased potential for conflicting traffic movements. Longer travel lengths require more driving time, reducing user convenience, increasing air pollution, and requiring more extensive traffic control measures within a parking facility. These factors are aggravated by increased chances for disruption to circulating traffic caused by parking-unparking maneuvers.

Maximum site length is related to horizontal circulation require-

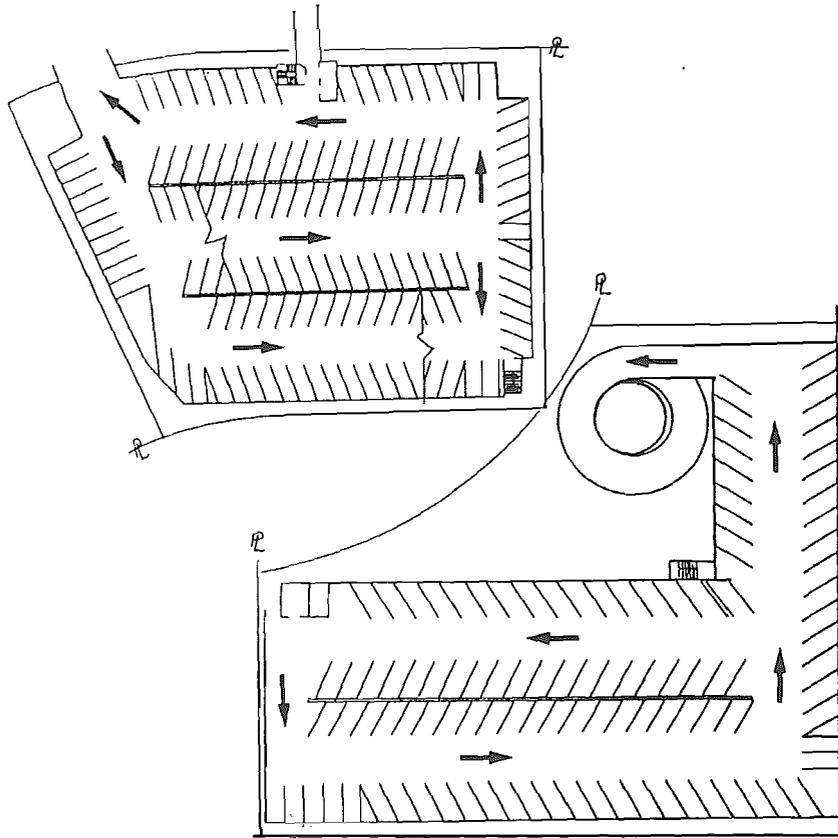


FIGURE 9. Odd-shaped sites may offer opportunities to develop ramps outside the basic structure envelope, or special street access.

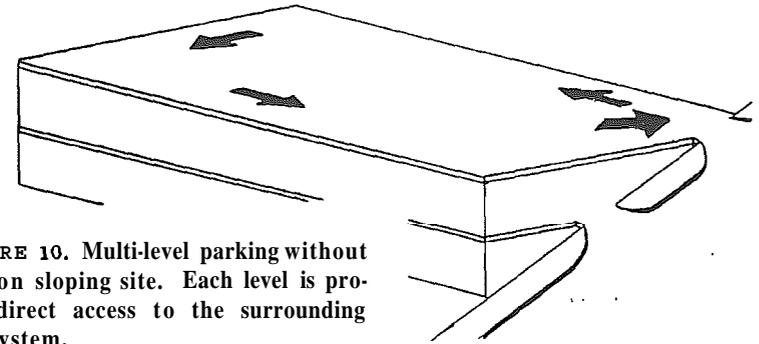


FIGURE 10. Multi-level parking without ramps on sloping site. Each level is provided direct access to the surrounding street system.

ments of particular facility configurations. Generally a 300-foot-long (91 meters) aisle is considered optimum in efficient length.¹⁵ Shortening the length decreases space-use efficiency, on a per stall basis. Lengthening increases travel time and traffic conflict potentials, unless auxiliary ramp systems are provided.

Land-Use Compatibility

Local ordinances frequently regulate new development. Height limitations, building setback requirements, visual screening of parked cars, and landscape requirements used to improve land-use compatibility affect parking design and, in some instances, site selection.

Height Limitations. Parking structure height is limited by (1) how many floor levels motorists are willing to traverse to reach a parking space, (2) cost of building vertically compared to cost of horizontal development, and (3) conformity to building heights in the area. The first two aspects represent design and economic controls; the third aspect relates to local ordinances.

In parking structures, clear height between floor and ceiling is commonly a little over 7 feet; 7.5 feet is desirable, (2.13 meters minimum, 2.29 meters desirable), floor-to-floor height being approximately 10 feet (3.05 meters). It has been found that to require drivers to make more than five or six 360-degree turns in traveling between the most distant parking level and the street level invites driver confusion, particularly on downward movements. Depending on ramp-system configuration, this maximum

¹⁵ Parking Standards Design Associates, *A Parking Standards Report, Vol. I*, prepared for Associated Organizations Committee and Other Involved Groups, City of Los Angeles, California, (March 1971), p. 22.

turn parameter will generally limit parking structures to seven stories above ground, resulting in 90 feet (approximately 27 meters) of maximum overall height, including roof-level light standards and stair/elevator towers.

Local regulations sometimes limit the maximum ground space for parking facilities, which may require multi-level development to provide a desired number of parking spaces. On the other hand, local regulations may also establish maximum building heights for reasons of visual amenity and/or fire-fighting accessibility. Table VIII provides typical examples of building code regulations for above-ground open-wall parking structures. Of the 92 cities listed, 30 permit 6 tiers of floors, and 26 permit 9 tiers. Seven cities allow 85-foot structural heights.

Height limitations, whether imposed by accepted design practices or local regulations, can have significant cost impacts on parking structure development. When height limitations prevent development of a desired number of above-ground parking spaces on a particular site, the alternatives are to acquire more land or to extend below ground, which both increase costs. A third alternative is to reduce capacity.

Setback Requirements. Street setback requirements are advantageous, although they can increase development cost by reducing overall size of possible sites. Advantages are generally believed to overshadow incurred costs. Setbacks provide more reservoir space to temporarily store entering and exiting traffic between street and parking facility access openings. Sight distances at parking garage entrances and exits are less likely to be obstructed, and turning radii can be more generous, providing faster traffic movement. Setbacks also allow space for landscaping and aesthetic improvements.

Visual Screening. Parking structures can be developed to look like a parking facility or blend with surrounding architectural statements. The choice depends on individual project goals and area objectives. When a parking facility looks like a parking facility, it serves as its own advertisement, conveying evidence of parking availability. However, many developers have felt that maintaining existing neighborhood architectural character, or improving visual aesthetics, is prerequisite for area or generator attraction. As a result, they have provided facades that fit the parking structure into the surrounding area.

Visual screening may have aesthetic as well as economic value. However, screening can conflict with good design and safety prac-

tices. Considerations requiring special attention include natural ventilation (or use of mechanical ventilation), maintenance of critical sight distances at access points, user security and orientation to surrounding generators; and natural lighting. Screening can also serve to control pedestrian access.

Multiple-use development is an effective means of blending parking with its environment, and at the same time integrating pedestrian and vehicular systems. Multiple-use development can both unify and beautify downtown areas.

Multiple use is the integration of parking with other land uses on the same site. A parking garage constructed under or above an office building, or as part of a retail complex, are examples—as would be a parking garage driving ramp extended outside a garage structure in airspace over property devoted to nonparking use.

Multiple-use development improves city center environmental quality, provides pedestrian circulation continuity, improves CBD land-use accessibility, and helps offset parking development costs. Advantages can also include convenience afforded by close proximity of parking facility and generator, a higher assurance of parking-space utilization, and lower total land costs through reduction in land requirements. Development cohesiveness and non-duplication of facilities are fostered by multiple-use development.

Principal problems are increased development costs and legal constraints impacting some public agencies. However, increased

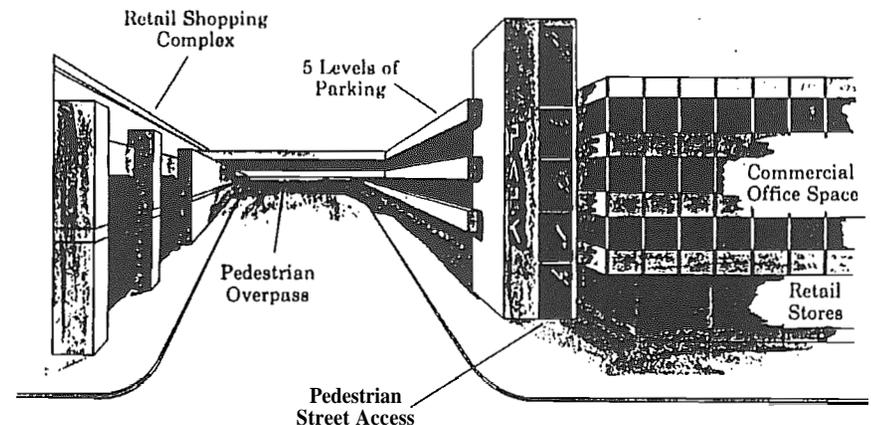


FIGURE 11. A multiple-use development concept integrating parking with other land uses on the same site, as well as a separate site.

ACCESS DESIGN

Parking garages have a main floor and storage floors. The main floor's principal function is accepting and delivering vehicles to and from the street system. This usually makes it the primary traffic control area where customers enter and leave by car and on foot. Vehicle storage may also be a main-floor function.

Main Floor Facilities

Areas for cashiering, ticket dispensing, manager's office, and employee facilities are usually provided on the main floor. Public restrooms and other customer convenience facilities, such as package checkrooms, telephones, vending machines, and waiting areas, when provided, are located typically on the main floor.

For commercial multiple-use developments incorporating structure parking, the street level or main floor is usually most desirable for retail development. Street-level retail development in multiple-use parking garages helps also to maintain block-face continuity in commercial areas.

While located generally at street level, the main floor can be one level above or below street level to accommodate multiple-use development. The most important main-floor design consideration involves location and capacity of entrance and exit points on surrounding streets.

Access and Reservoir Requirements

Access points should be provided in conformance with local regulations. They should present a recognizable and attractive appearance to prospective customers, while simultaneously providing for safe crossing of pedestrian and vehicular traffic. Requirements for reservoir storage space and control of entering and departing movements depend on whether parking fees are charged and method of revenue collection, type of operation (self-park or attendant-park), magnitude of peak parking-unparking activity, and reservoir opportunities on surrounding streets.

Functions of Reservoir Spaces. The purpose of reservoir spaces is to temporarily store queued vehicles entering or leaving a parking facility. Exit reservoir space should be adequate to prevent queued traffic, stopped to pay the parking fee and/or stopped by street traffic, from congesting the garage circulation system and blocking stall access.

Entrance reservoir problems exist principally in attendant-park garages, where customers drive into the garage entrance reservoir,

TABLE IX—TYPICAL INBOUND RESERVOIR NEEDS

<i>Use</i>	<i>Reservoir Requirement</i>
Free flow entry	1 space per entry lane
Ticket dispenser entry	2 spaces per entry lane
Manual ticket dispensing	8 spaces per entry lane
Attendant parking	10 percent of that portion of parking capacity served by the entry lane

Source: Paul C. Box & Associates, generally unpublished field studies.

leaving vehicles to be parked by garage attendants. In self-parking garages, customers drive directly to storage levels, pausing briefly at the entrance, if at all, to receive a parking ticket or to activate an automatic revenue control mechanism.

Most parking garages are operated as self-parking facilities because customers prefer to park their own vehicles and because operators prefer to avoid high labor costs associated with attendant-park operation. Self-park facilities usually require an inbound traffic reservoir for one to eight cars per entry lane, depending on revenue control and operational type (see Table IX). This space provides for driver orientation and prevents blocking of the street system by vehicle queues.

Anticipation of the amount of queuing at entrance and exit control points, or queuing by exiting vehicles that might be blocked by street traffic, requires an analysis of average arrival rates of parking-unparking vehicles and the capacity of revenue-control points and the recipient street lanes.

Desirable Intake/Discharge Capacities. Generally, garages should be able to fill or completely discharge within a maximum of 1 hour.²² When generated parking demand is of a surge type, such as demand generated by sporting events, rapid parking garage filling and emptying becomes a critical consideration. Ideally, special-event, surge-type demand facilities should be capable of emptying within 30 minutes.²³

With well-designed stall/aisle and interfloor ramp systems, traffic-flow capacity limitations most often occur at entrance and exit points, and at junction points where departing vehicles enter the street system. Traffic flow breakdowns happen when the parking

²² Highway Research Board, *Parking Principles*, p. 115.

²³ Hunnicutt, "Parking, Loading, and Terminal Facilities," p. 687

garage system is constrained by traffic restrictions at entrance points or is congested by the lack of capacity at exits. These conditions usually happen in morning and afternoon peak periods, but could occur at other times if the turnover rate is high.

Entrance/Exit Capacity. Entrance/exit capacity should prevent vehicles from queuing onto approach streets, and minimize vehicle queuing before they enter the street flow. Too many lanes at entrance or exit points may cause driver confusion through duplication, and are a costly misuse of space, inviting inefficient labor use when garage personnel issue tickets or collect fees. The important consideration is that an adequate number of lanes be provided, not necessarily the maximum number possible.

Automatic Gate Controls. Lifting barrier-arm gate types are often used at entrances or exits to ensure parking ticket issuance or parking fee payment (and/or to count or ensure one-way traffic flow). Capacity varies according to barrier purpose, angle of approach, curvature radius of the vehicle travel path, and approach lane gradient.

Entrance gates are usually in conjunction with automatic ticket dispensers or magnetic-coded card readers. Lane capacity with automatic ticket dispenser and gate control is generally between 350 vehicles per hour (when tight turning movements are required) and 500 vehicles per hour when the approach is straight or in-line with structure openings.²⁴ Under conditions of constant waiting lines, 660 vehicles per hour per lane with automatic ticket dispensers have been counted.²⁵ Maximum design capacity is typically 400 vehicles per hour per controlled entrance lane.

Contemporary parking garage design favors large, unrestricted entrance openings, well delineated for easy driver recognition. In some instances, entrances have been made three lanes wide to avoid impressions of a "hole-in-the-wall." However, two-lane entrances are more common.

The discharge capacity of gate-controlled exit lanes has been found to range between 150 and 225 vehicles per hour per lane,²⁶ Full discharge capacity may not be achieved if there is insufficient

²⁴P. B. Ellson, *Parking: Dynamic Capacities of Car Parks, RRL Report LR221*, (Crowthorne, England: Road Research Laboratory, Ministry of Transport, 1969), pp. 14-15.

²⁵Highway Research Board, *Parking Principles*, p. 115.

²⁶Ellson, *Parking: Dynamic Capacities of Car Parks*, pp. 14-15; and Highway Research Board, *Parking Principles*, p. 115.

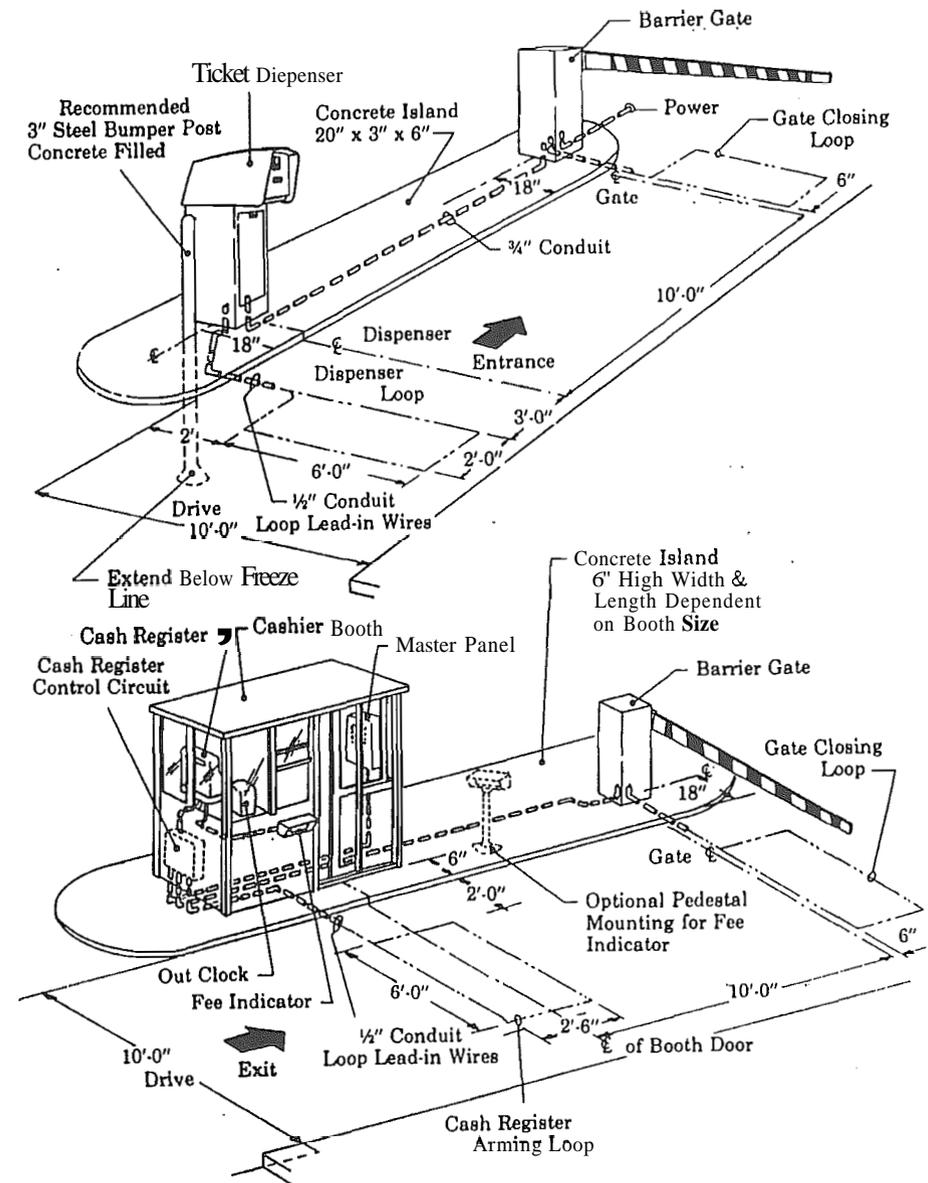


FIGURE 18. Typical ticket dispenser with barrier gate installation, and typical exit lane control equipment.

Source: Stanley Parking Systems, Madison Heights, Michigan.

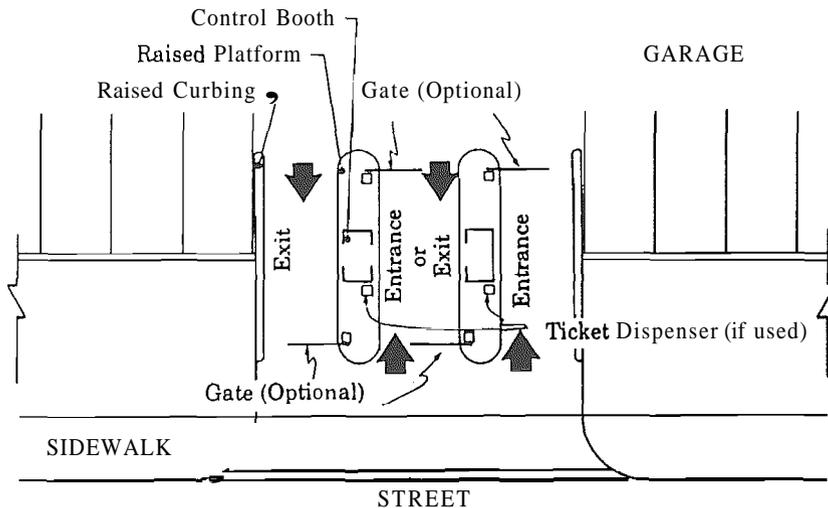


FIGURE 19. Plan for reversible lane operation.

reservoir space beyond the gate or garage exit for vehicles to queue while waiting for acceptable gaps in street traffic flow.

Parking garages generally need two exit lanes for each entry lane. Reversible lane operation is desirable to accommodate peak out-bound and inbound traffic flow. Directional traffic flow is commonly facilitated with red and green traffic signal lights over each lane.

Entrance/Exit Dimension Guidelines. Driveway entrance and exit design should consider driveway width, turning radii, angle of approach and departure in relation to the street, directional traffic flow, and spacing from intersections, other driveways and property lines. Table X gives suggested driveway design values for urban area locations with both high and low pedestrian activity. Ideally, pedestrian-vehicular crossing separations should be used where driveways cross sidewalks with very high pedestrian traffic.

When driveway widths and radii (on the entering side) are made larger, more rapid traffic flow generally can be expected. While generous widths and radii are usually desirable, driveways with high pedestrian volume crossings may be designed with less generous dimensions to encourage lower vehicular entry and exit speed.

Entrance/Exit Safety. Sidewalk pedestrian circulation requirements should be recognized in developing multi-lane garage access points. Ideally, several car-lengths should be provided between the sidewalk and the control point.

TABLE X—TYPICAL ENTRANCE AND EXIT DRIVEWAY DIMENSION GUIDELINES

Dimension	Urban		
	High Pedestrian Activity ^a	All Other ^b	Rural
Width ^c (in feet)			
Minimum (one-way)	15	15	15
Minimum (two-way)	25	25	30
Maximum	30	35	40
Right turn radius ^d (in feet)			
Minimum	5	10	15
Maximum	10	30	50
Spacing ^e (in feet)			
From property line	0	0	0
From street corner	10	10	15
Between driveways	10	0	0
Angle ^f (in degrees)	75	45	45

^aAs in central business areas or in same block with auditoriums, schools, and libraries.

^bThe remaining city streets including neighborhood business, residential, and industrial.

^cMeasured along right-of-way line at inner point of curbed radius sweep or between radius and near edge of curbed island at least 50 square feet in area. The minimum width applies principally to one-way driveways.

^dOn side of driveways exposed to entry or exit by right turning vehicles.

^eMeasured along curb or edge of pavement from roadway end of radius.

^fMinimum acute angle measured from edge of pavement.

Source: *Parking Principles*, Highway Research Board, Special Report No. 125, (1971), p. 121.

Special consideration should be given to entrance lighting, since drivers entering a parking garage from bright sunlight may experience some temporary visual impairment if light levels are low immediately inside the entrance. While landscaping of border areas between structure and street often improves aesthetics, care should be taken to assure that decorative landscape features, after maturity, do not obstruct lateral sight distance at garage access points.

Parking garage exits should be designed to permit unobstructed sight distance for drivers and pedestrians. Wherever possible, however, signs and pavement markings should be used to alert both drivers and pedestrians to potential crossing conflicts. Some ga-

Chapter VI

PEDESTRIAN CIRCULATION

Parking garage planning and design should provide attractive pedestrian circulation within the garage and between the garage and final destinations. Three basic movements are normally accommodated:

1. horizontal movement from parked vehicle to stairs or elevators—usually along the parking garage driving aisles,
2. vertical movement—by stairs, ramps, or elevators, and
3. connections to street and adjacent buildings—usually separate walkways.

PLANNING

In most parking garages, pedestrian regulations are difficult to enforce. Pedestrians tend to walk in a path representing the shortest distance, and they have a basic resistance to changing grades or following a prescribed path that is obviously circuitous to an alternate travel route.

Design Concepts

When possible, it is desirable to separate pedestrians from major vehicular movements. However, within a garage it is nearly impossible to separate the horizontal movement of pedestrians from circulating vehicular traffic. Raised or separated walkways on parking floors usually do not receive enough use to merit their expense and, when provided, are often discontinuous. The two basic design concepts involved are pedestrian-vehicular coordination and pedestrian-vehicular separation.

Pedestrian-Vehicular Coordination. Parking garage designs must anticipate moving pedestrians off of storage floors over the shortest possible distance, via the vehicular circulation system. This is accomplished by locating pedestrian access points around the structure perimeter (see Figure 53). Garages with large floor areas, or garages located underground or under office structures or other types of activity centers, frequently provide centrally located pedestrian access points (see Figure 54). It is desirable to have all

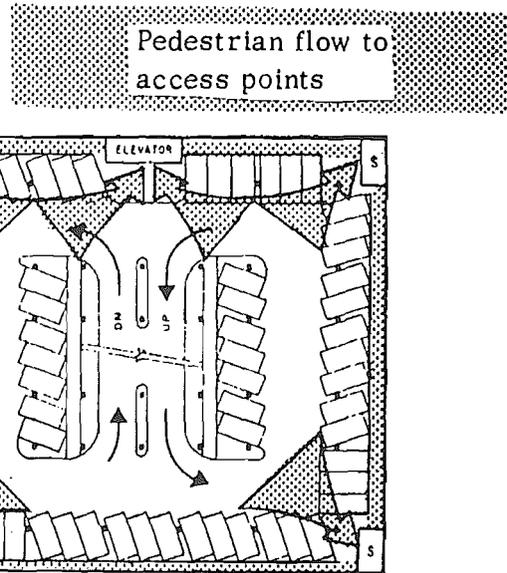


FIGURE 53. Pedestrian access around perimeter of garage.

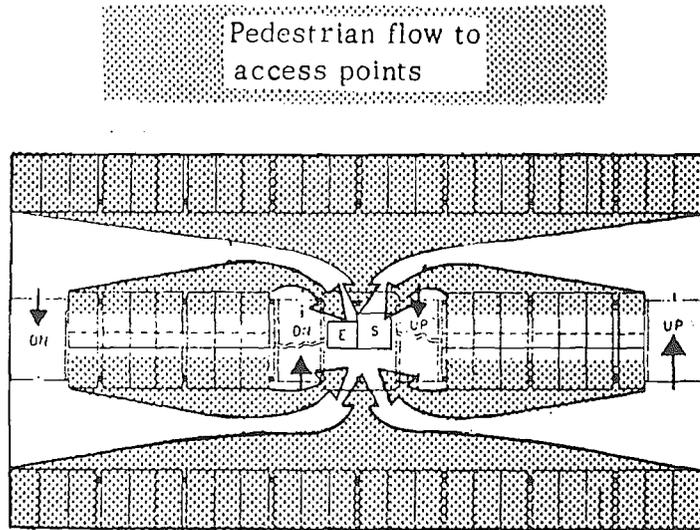


FIGURE 54. Pedestrian access centrally located in garage.

parking spaces no more than 100 feet (30.5 meters) from the nearest pedestrian access point on parking levels.

Sight distance, adequate lighting, and well-marked pedestrian access points, coupled with signing for pedestrians, driver orientation, and clearly defined vehicular movements, will aid pedestrian circulation on parking floors.

Pedestrian-Vehicular Separation. The physical separation of pedestrians and vehicles can be essential for a location where major flows of pedestrians and vehicles are likely to cross. Basically, pedestrians can be segregated from vehicular traffic by providing separate walkways or by pedestrian tunnels or bridges.

Pedestrian-vehicular separation measures increase construction costs and require more space. However, pedestrians must be afforded safe walking paths. Separated pedestrian systems offer the opportunity to provide direct, climate-controlled connections to adjacent buildings and/or other pedestrianways, adding to the attractiveness of both the trip generators and the parking facility. In areas of intense pedestrian activity, separated systems are especially desirable from aspects of safety, reduced walking distance, convenience, and comfort.

Pedestrian Service Facilities and Amenities

Features such as signing for pedestrians and illumination are essential for safe and orderly movement. Facilities offering functional convenience and visual amenity can help to make pedestrians comfortable and pleasantly aware of their surroundings.

Pedestrian Signage. A parking garage informational system for pedestrians is indispensable. When properly designed, it can improve pedestrian safety and perceptions of the facility, while simultaneously contributing to a smooth flow of pedestrian traffic. The parking garage layout is in itself an information system that, if poorly designed, necessitates more add-on visual graphics and signing.

A garage pedestrian information system should be uniform in location, color, size, and style, and continuous between the parking spaces and generator for both directions of pedestrian movements. The clear orientation of pedestrians is essential. Good graphics suggests the use of one style of lettering, locating messages at decisionmaking points, segregating informational and directional signing from advertising, and avoiding advertisements at critical decision points in order to provide maximum visibility.

A study of visual design aspects for signing at terminals⁴⁵ emphasized these guidelines:

1. Messages should be direct and simple, using short, familiar terms.
2. The number of independent informational messages should be kept to a minimum.
3. Message content should be consistent in terms and units, not requiring translation.
4. Continuity and consistency in graphic design, and clear lines of sight, should be provided throughout the pedestrian signage system.

In multiple-use developments, pedestrian signage in parking areas should be consistent with signing elsewhere in the development. It should clearly identify routes to generators, parking areas, special garage service facilities, and to bus stops or taxicab stands when these facilities are pertinent to the parking facility.

Illumination. Lighting, a necessity for security and pedestrian movement, creates a psychological impression of the walking environment on pedestrians. Adequate lighting can create a feeling of comfort and security, but it can also emphasize the cleanliness (or uncleanness) of a parking facility. Generally, minimum lighting should be in the range of 10 to 20 horizontal footcandles (106 to 212 Lux).⁴⁶ However, other considerations such as maximum discomfort glare rating, reflectance, and emergency lighting require detailed design based on accepted standards.

Lighting patterns should emphasize floor areas, particularly where elevation changes exist. Natural lighting should be provided for daytime operation wherever feasible.

Pedestrian Service Facilities. Special service facilities such as package checkrooms or areas, waiting areas, vending machines, and restrooms can be provided in parking garages as customer conveniences. When provided, these facilities are usually located on the main level of pedestrian activity, and preferably where they can be easily monitored by garage personnel.

Garages frequently provide maps showing nearby stores and other parking facilities, including informational brochures on

⁴⁵J. Fruin, "Environmental Factors in Passenger Terminal Design," *Transportation Engineering Journal* of the American Society of Civil Engineers, 98 no. TE1 (February 1972): 89-101.

⁴⁶James Antoniou, "Planning for Pedestrians," *Traffic Quarterly*, 25 no. 1 (January 1971): 55-71.

operating procedures. In attendant-park garages, it is customary to provide waiting rooms or areas. Public restrooms generally have disappeared from newer self-service garages, possibly because of the associated security and maintenance problems.

Some parking facilities have enhanced their service and customer relations by providing baby strollers, diaper-changing areas and bottle warmers, wheelchairs, umbrellas, and other items for customers' convenience. These items also can provide a profitable means of advertising for local business firms and the parking facility.

Vending machines inside parking garages are a matter of policy. Anticipated vending machine revenues and patron convenience should be compared to the costs of space, maintenance, refuse removal, signing, and control of vandalism and loitering.

Public pay telephones are usually placed in parking garages simply for convenience, since they generally do not receive enough use in parking facilities to justify their existence by telephone company standards. Public telephones are normally located near the main pedestrian entrance on ground level.

Trash receptacles should be adequate in number and located where they are easy to use. They must be conspicuously recognizable, yet designed to compliment their environment.

Aesthetics. Pedestrian malls and walkways connecting parking facilities with trip generators offer opportunities for interesting and varied visual treatments. This can be accomplished with the use of different textured (or colored) paving materials arranged in decorative patterns, and with landscape plantings.

Materials for doors, walls, floors, and other surface areas along pedestrianways should be able to resist and endure abuse. Surface areas should be of materials resistant to breakage and marking, and should be easy to clean and maintain.

Maintenance. Attention should be given to water drainage and to cleaning pedestrian areas. Water hose connections should be provided at convenient locations—generally not more than 120 feet (36 meters) apart—to facilitate washing walkway areas and watering landscape plantings.

For mechanized sweeping, attention should be given to adequate dimensions along pedestrianways, and their load-bearing capacity. For extensive pedestrian systems, provision for mechanized cleaning can also serve double duty in providing access for emergency vehicles and snow removal equipment.

PEDESTRIAN TRAVEL FACILITIES

The type and size of pedestrian facilities depends on how they are to be used and what degree of comfort is to be provided. Pedestrian walkway widths should be related to the particular pedestrian flows they are expected to accommodate. For example, the capacity of a walkway used by special-event crowds (high pedestrian demand in a short time period) may be quite different from requirements for shoppers (less intense pedestrian demand, spread over a longer time frame). Because pedestrian traffic generated in most parking garages is light, traditional level-of-service standards are rarely relevant. Design of walkways and pedestrian areas becomes more concerned with spatial composition and amenities influencing the pedestrian environment.

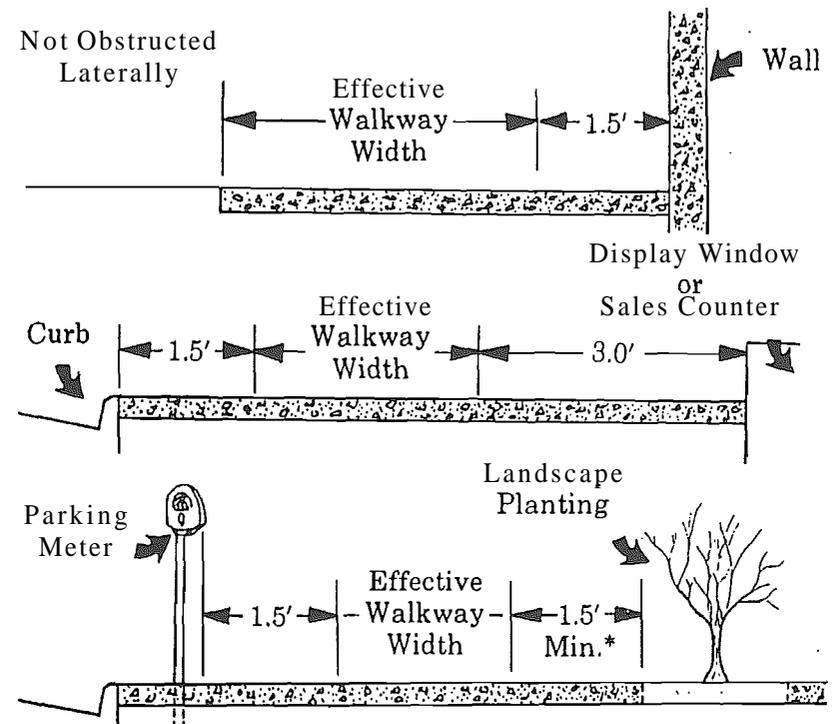
Walkway Widths

Minimum walkway widths for light pedestrian flows typically range from 4 to 5 feet⁴⁷ (1.2 to 1.5 meters), with the principal consideration being to provide enough space for two persons to walk abreast or to pass each other. If the walkway is obstructed laterally, effective width is decreased, and an extra 1.5 feet (0.5 meter) of walkway width should be provided. Walkways adjacent to display windows or sales counters should provide an extra 3 feet (0.9 meter) of width.

Wider walkways should be used for sidewalks along streets bordering parking facilities. A walkway having an effective width of 7.5 feet (2.3 meters) is considered a minimum for lightly used urban sidewalks. This width will provide an open-flow level of service for pedestrian volumes up to approximately 200 persons per hour. Figure 55 illustrates several design situations providing an effective 7.5-foot (2.3-meter) walkway width. These designs allow couples to be passed by individuals without significant psychological interaction or physical restriction.

Pedestrian Crude Separations

Grade-separated walkways provide additional space for pedestrian movements, eliminate pedestrian-vehicular conflicts, permit opportunities for views and vistas, and offer more opportunities for people-interaction between multi-level structures. However, for grade-separated walkways to be justified on a traffic basis only,



*Actual allowance to obtain an effective walkway width depends on type of planting and desired appearance at maturity.

FIGURE 55. Several design situations illustrating where effective walkway width is measured.

exceptional pedestrian travel demand is generally required at the structure levels to be served by the separated walkways.

Pedestrian bridges and tunnels may be desirable when the generator is separated from the parking garage by heavily-traveled streets, where abnormal hazard or inconvenience to pedestrians would otherwise result. They are also feasible to improve access to malls, shopping complexes, and major buildings, particularly in areas having a scarcity of space. A desirable objective is to provide weather-protected and vehicular traffic-free connections to encourage use of both the garage and surrounding land uses. Such an approach, carried to its ultimate, allows the garage system to be integrated with other existing and proposed pedestrian systems.

⁴⁷Ibid., p. 149.

SEC. 101.0809 PARKING ASSESSMENT DISTRICT

Property (hereinafter in this section referred to as subject property) within an assessment district formed pursuant to any parking district ordinance adopted by the City Council shall be excepted from the requirements of any zone as to the number of required off-street parking spaces in accordance with the application of the following formula:

(assessment against the subject property) ÷ (total assessment against all property in the parking district) × (parking spaces provided in the district facility) × 1.25 = parking spaces excepted.

The remainder of the off-street parking spaces required by the applicable zoning regulations shall be provided on the lot or premises of the subject property or as otherwise provided in the particular zone. Property located within more than one parking assessment district shall be entitled to an exception based on the sum of the exceptions calculated by the application of the formula referred to above to each parking assessment district.

[Added 1-28-64 by Ord. 8960 N.S.]

[Amended 8-29-70 by Ord. 10399 N.S. effective 5-1-71]

[Renumbered 11-13-78 by Ord. 12485 N.S., formerly contained in Sec. 101.0800.]

SEC. 101.0810 COMPUTATION

In computing the required number of off-street parking spaces, a remaining fraction of one half or more shall be deemed a whole unit of measurement; a remaining fraction of less than one-half may be disregarded;

(Added 1-28-64 by Ord. 8960 N.S.)

(Amended 8-29-70 by Ord. 10379 N.S. effective 3-1-71)

(Renumbered 11-13-78 by Ord. 12485 N.S., formerly contained in Sec. 101.0800.)

SEC. 101.0811 MARKING OF SPACES

Where five or more required spaces are provided on a lot, each space shall be clearly marked with paint or any other more durable material contrasting in color with the surface to which applied.

[Added 1-28-64 by Ord. 8960 N.S.]

[Amended 8-27-70 by Ord. 10375 N.S. effective 3-1-71]

(Renumbered 11-13-78 by Ord. 12485 N.S., formerly contained in Sec. 101.0800.)

SEC. 101.0812 COMPUTATION - UNMARKED AREAS

In an unmarked parking area containing less than five spaces, the number of spaces shall be the quotient of the total number of square feet in the usable parking area divided by 350 square feet.

(Added 1-28-64 by Ord. 8960 N.S.)

(Amended 8-27-70 by Ord. 10375 N.S. effective 3-1-71)

(Renumbered 11-13-78 by Ord. 12485 N.S., formerly contained in Sec. 101.0800.)

SEC. 101.0813 MINIMUM DIMENSIONS FOR PARKING SPACES

A. Parking spaces shall have a minimum width of eight and one-half (8-1/2) feet and a minimum depth of twenty (20) feet, except for spaces for less than standard size cars as authorized by this section, which shall have a minimum width of seven and one-half (7-1/2) feet and a minimum depth of fifteen (15) feet.

B. Commencing on the effective date of the ordinance adopting these regulations, 40 percent of the total minimum off-street parking requirement may be allocated to compact car spaces; commencing January 1, 1981, this allocation may be increased to 50 percent; and, commencing January 1, 1983, this allocation may be increased to 60 percent.

C. Compact car spaces shall be clearly designated and all necessary markings and signs shall be maintained and/or replaced on a regular interval as may be necessary. When existing parking areas are redesigned to accommodate compact car spaces, the old signs and space markings shall be removed or completely covered in an appropriate manner as approved by the Zoning Administrator.

D. Aisles and driveways shall be dimensioned in substantial conformance with standards adopted by the Planning Commission as set forth in a document entitled "Locational Criteria, Development Standards and Operational Standards - Off-street Parking Lou." on file in the office of the Planning Department. Substantial conformance shall be determined by the Zoning Administrator; said determination shall be subject to appeal in the manner set forth in Section 101.0503.

(Added 1-28-64 by Ord. 8960 N.S.)

(Amended 8-27-70 by Ord. 10375 N.S. effective 3-1-71)

(Renumbered and amended 11-13-78 by Ord. 12485 N.S., formerly contained in Sec. 101.0800.)

(Amended 6-23-86 by 0-16672 N.S.)

SEC. 101.0814 ACCESS AND GRADES

A. Each space shall open directly upon an aisle or driveway of such width and design as to provide safe and efficient means of vehicular access to such parking space, except as herein provided. All required parking facilities shall have convenient, direct and adjacent access to a public street or alley.

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