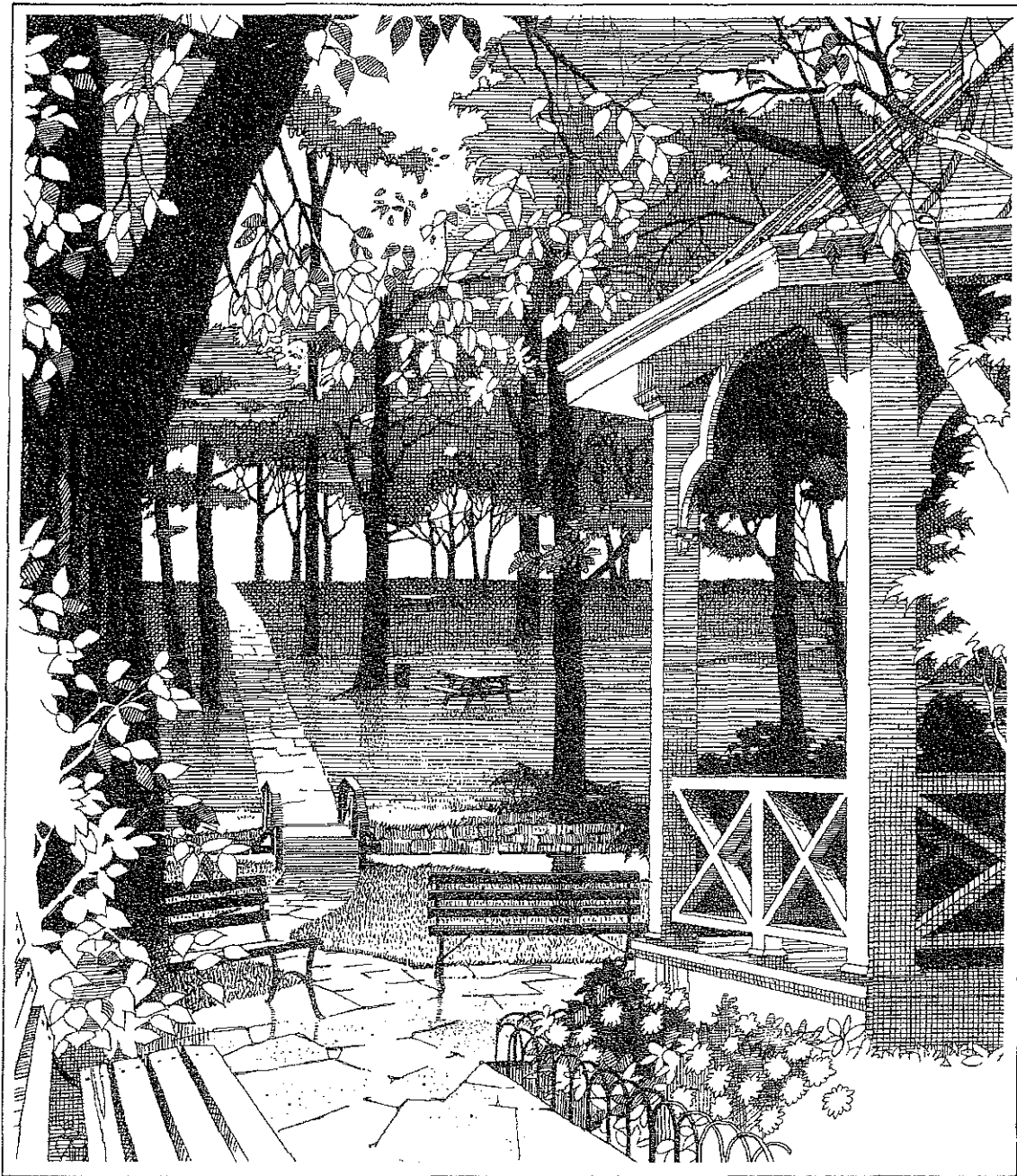


PARK MAINTENANCE STANDARDS



A cooperative project of
the American Park and Recreation Society
and
the National Society for Park Resources,
professional branches of
the National Recreation and Park Association.

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Preface

Inspiration for the body of information found in this document came as a result of the formation of the Park Maintenance Standards Project in 1979. Founded as a joint professional effort between the American Park and Recreation Society and the National Society for Park Resources, co-chairmen were appointed. Ron Donahue represented APRS and Art Wilcox represented NSPR. This document represents a combination of three major study areas: Maintenance Standards Classification System, Productivity Standards and a Glossary of Park Maintenance Terms. Each major section had an author or authors which appears in the credits. Actually more than 600 people contributed in some way to the finished product. Some of the research and recommendations will be original. Most of the material used is not. So much material was examined that it may in fact be almost impossible to credit the original contributor. The very slowness of the project and the vast numbers of contributors have only served to produce a document which has had considerable examination. It is hoped that the information contained in this effort will become accepted by the Park and Recreation profession as benchmark data. It then will be used to standardize approaches to maintenance and eventually provide some cost data which is comparable between agencies.

Ron Donahue
Superintendent of Parks
City of Boulder, Colorado

Acknowledgements

Section I

Ron Donahue, Boulder, Colorado, Editor
Ted Haskell, East Lansing, Michigan
Robert D. Espeseth, Champaign, Illinois
Edward Harvey, Champaign, Illinois

Section II

Robert D. Espeseth, Champaign, Illinois, Co-chairman
Edward Harvey, Champaign, Illinois, Co-chairman
Reid Bateman, Naperville, Illinois
Virgil L. Taylor, Ft. Collins, Colorado
Thomas D. Warner, Manhattan, Kansas
Charles C. Williams, Rock Hill, South Carolina
Gene Williamson, Arvada, Colorado
Theodore Haskell, East Lansing, Michigan
Steve Plumb, Elmhurst, Illinois
Bill Rasmussen, Takoma, Washington
Barbara Meldman, Champaign, Illinois
Alan Ledgin, Champaign, Illinois

Section III

Ken Kutska, Wheaton, Illinois
Lance Loucks, Lombard, Illinois
William Braver, Lombard, Illinois
Walter H. Bumgardner, Hattiesburg, Mississippi
Gale Bundrick, Tucson, Arizona
George Gowans, Washington, D.C.
Vito DiCanio, Evanston, Illinois
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William Donels, Springfield, Illinois
Ronald E. Cotten, Estes Park, Colorado
Sam Crowell, Nashville, Tennessee
Jose E. Herrera, Las Vegas, New Mexico
Donald V. Joyce, University Park, Pennsylvania
George T. O'Malley, Jr., Denver, Colorado
David A. Pressler, Reno, Nevada

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SECTION I

Maintenance Standard Classification System

Development of a standard maintenance classification system has been extremely difficult because there have been problems devising a system comprehensive enough to apply to the wide variety of park systems in existence. In order to be of help in setting up a standard approach at the local level, each maintenance Mode has 14 elements of consideration. There may be additional segments within these elements to make up the total maintenance cost program. Even the choice of nomenclature has avoided the term "class" so that less intense maintenance approaches avoid possible name stigma that might come to mind when "Class 2" or "Class B" is used. Mode is meant to mean "the way of" maintenance ranging from the most intensive to the least intensive. Some park systems may have parks that match only one or two of the defined modes. Some systems may have maintenance approaches that almost match the system but leave one or two elements out. An exact match is not necessary, but this system is intended to give a wide enough set of options that a general match-up can be achieved. Some park departments may even designate a part of a park at one mode and the rest of the park as another mode. Costs per unit for maintenance can vary from locality to locality because of labor rates, costs of materials, extent of design, length of season, moisture availability, transportation costs and intensity of public use. It should be possible, however, to establish a local maintenance cost standard for each mode and chart those unit costs year by year. It should also be possible to come up with a maintenance cost forecast for new developments by assigning the proper mode to the new development. At higher maintenance modes it is assumed that the administering agencies will have adequate time and properly trained personnel to accomplish the quality that should accompany the quantity of work done.

Mode I

State of the art maintenance applied to a high quality diverse landscape. Usually associated with high traffic urban areas such as public squares, malls, governmental grounds or high visitation parks.

1. *Turf care* — Grass height maintained according to species and variety of grass. Mowed at least once every five working days but may be as often as once every three working days. Aeration as required, not less than four times per year. Reseeding or sodding as needed. Weed control should be practiced so that no more than one percent of the surface has weeds present.

2. *Fertilizer* — Adequate fertilization applied to plant species according to their optimum requirements. Turf species should follow the chart on page 00 for recommended rates. Application rates and times should ensure an even supply of nutrients for the entire year. Nitrogen, phosphorus and potassium percentages should follow local recommendations from your County Extension Service. Trees, shrubs and flowers should be fertilized according to their individual requirements of nutrients for optimum growth. Unusually long or short growing seasons may modify the chart slightly.

3. *Irrigation* — Sprinkler irrigated. Electric automatic commonly used. Some manual systems could be considered adequate under plentiful rainfall circumstances and adequate staffing. Frequency of use follows rainfall, temperature, seasonal length and demands of plant material.

4. *Litter control* — Minimum of once per day, 7 days per week. Extremely high visitation may increase the frequency. Receptacles should be plentiful enough to hold all trash generated between servicing without normally overflowing.

5. *Pruning* — Frequency dictated primarily by species and variety of trees and shrubs. Length of growing season and design concept also a controlling factor as are clipped hedges versus natural style. Timing usually scheduled to coincide with low demand periods or to take advantage of special growing characteristics such as low demand periods or to take advantage of special growing characteristics such as pruning after flowering.

6. *Disease and Insect Control* — Control program may use any of three philosophies: 1.) Pre-

ventative; a scheduled chemical or cultural program designed to prevent significant damage. 2.) Corrective; application of chemical or mechanical controls designed to eliminate observed problems. 3.) Integrated pest management; withholding any controls until such time as pests demonstrate damage to plant materials or become a demonstrated irritant in the case of flies, mosquitoes, gnats, etc. At this maintenance level the controlling objective is to not have the public notice any problems. It is anticipated at Mode I that problems will either be prevented or observed at a very early stage and corrected immediately.

7. *Snow removal* — Snow removal starts the same day as accumulations of ½ inch are present. At no time will snow be permitted to cover transportation or parking surfaces longer than noon of the day after the snow stops. Applications of snow melting compound and/or gravel are appropriate to reduce the danger of injury due to falls.

8. *Lighting* — Maintenance should preserve the original design. Damaged systems should be repaired as quickly as they are discovered. Bulb replacement should be done during the first working day after the outage is reported.

9. *Surfaces* — Sweeping, cleaning and washing of surfaces needs to be done so that at no time does an accumulation of sand, dirt and leaves distract from the looks or safety of the area. Repainting or restaining of structures should occur when weather or wear deteriorate the appearance of the covering. Wood surfaces requiring oiling should be done a minimum of four times per year. Stains to surfaces should be taken off within five working days. Graffiti should be washed off or painted over the next working day after application.

10. *Repairs* — Repairs to all elements of the design should be done immediately upon discovery provided replacement parts and technicians are available to accomplish the job. When disruption to the public might be major and the repair not critical, repairs may be postponed to a time period which is least disruptive.

11. *Inspection* — Inspections of this area should be done daily by a member of staff.

12. *Floral plantings* — Normally extensive or unusual floral plantings are part of the design. These may include ground level beds, planters or hanging baskets. Often multiple plantings are scheduled, usually at least two blooming cycles per year. Some designs may call for a more frequent rotation of bloom. Maximum care of watering, fertilizing, disease control, disbudding and weeding is necessary. Weeding flowers and shrubs is done a minimum of once per week. The desired standard is essentially weed free.

13. *Rest rooms* — Not always a part of the design but where required will normally receive no less than once per day servicing. Especially high traffic areas may require multiple servicing or a person assigned as attendant.

14. *Special features* — Features such as fountains, drinking fountains, sculpture, speaker systems, structural art, flag poles or parking and crowd control devices may be part of the integral design. Maintenance requirements can vary drastically but for this mode it should be of the highest possible order.

Mode II

High level maintenance—associated with well developed park areas with reasonably high visitation.

1. *Turf care* — Grass cut once every five working days. Aeration as required but not less than two times per year. Reseeding or sodding when bare spots are present. Weed control practiced when weeds present visible problem or when weeds represent 5 percent of the turf surface. Some pre-emergent products may be utilized at this level.

2. *Fertilizer* — Adequate fertilizer level to ensure that all plant materials are healthy and growing vigorously. Amounts depend on species, length of growing season, soils and rainfall. Rates should correspond to the lowest recommended rates shown on the chart on page 14. Distribution should ensure an even supply of nutrients for the entire year. Nitrogen, phosphorus and potassium percentage should follow local recommendations from the County Extension Service. Trees, shrubs and flowers should receive fertilizer levels to ensure optimum growth.

3. *Irrigation* — Some type of irrigation system available. Frequency of use follows rainfall, temperature, seasonal length, and demands of plant material.

4. *Litter control* — Minimum of once per day, five days a week. Off-site movement of trash dependent on size of containers and use by the public. High use may dictate once per day cleaning or more. Containers are serviced.

5. *Pruning* — Usually done at least once per season unless species planted dictate more frequent attention. Sculptured hedges or high growth species may dictate a more frequent requirement than most trees and shrubs in natural growth style plantings.

6. *Diseases and disease control* — Usually done when disease or insects are inflicting noticeable damage, reducing vigor of plant materials or could be considered a bother to the public. Some

preventative measures may be utilized such as systemic chemical treatments. Cultural prevention of disease problems can reduce time spent in this category. Some minor problems may be tolerated at this level.

7. *Snow removal* — Snow removed by noon the day following snowfall. Gravel or snow melt may be utilized to reduce ice accumulation.

8. *Lighting* — Replacement or repair of fixtures when observed or reported as not working.

9. *Surfaces* — Should be cleaned, repaired, repainted or replaced when appearance has noticeably deteriorated.

10. *Repairs* — Should be done whenever safety, function, or bad appearance is in question.

11. *Inspection* — Inspection by some staff member at least once a day when regular staff is scheduled.

12. *Floral planting* — Some sort of floral plantings present. Normally no more complex than two rotations of bloom per year. Care cycle usually at least once per week except watering may be more frequent. Health and vigor dictate cycle of fertilization and disease control. Beds essentially kept weed free.

13. *Rest rooms* — When present should be maintained at least once per day as long as they are open to public use. High use may dictate two servicings or more per day. Servicing period should ensure an adequate supply of paper and that rest rooms are reasonably clean and free from bad odors.

14. *Special features* — Should be maintained for safety, function and high quality appearance as per established design.

Mode III

Moderate level maintenance—associated with locations with moderate to low levels of development, moderate to low levels of visitation or with agencies that because of budget restrictions can't afford a higher intensity of maintenance.

- ✓ 1. *Turf care* — Cut once every 10 working days. Normally not aerated unless turf quality indicates a need or in anticipation of an application of fertilizer. Reseeding or resodding done only when major bare spots appear. Weed control measures normally used when 50 percent of small areas is weed infested or general turf quality low in 15 percent or more of the surface area.
2. *Fertilizer* — Applied only when turf vigor seems to be low. Low level application done on a once per year basis. Rate suggested is one-half the level recommended on page 14 for species and variety.
3. *Irrigation* — Dependent on climate. Rainfall locations above 25 inches a year usually rely on natural rainfall with the possible addition of portable irrigation during periods of drought. Dry climates below 25 inches normally have some form of supplemental irrigation. When irrigation is automatic a demand schedule is programmed. Where manual servicing is required two to three times per week operation would be the norm.
- ✓ 4. *Litter control* — Minimum service of two to three times per week. High use may dictate higher levels during warm season.
- ✓ 5. *Pruning* — When required for health or reasonable appearance. With most tree and shrub species this would not be more frequent than once every two or three years.
6. *Disease and Insect Control* — Done only on epidemic or serious complaint basis. Control measures may be put into effect when the health or survival of the plant material is threatened or where public's comfort is concerned.
- ✓ 7. *Snow removal* — Snow removal done based on local law requirements but generally accomplished by the day following snowfall. Some crosswalks or surfaces may not be cleared at all.
- ✓ 8. *Lighting* — Replacement or repair of fixtures when report filed or when noticed by employees.
- ✓ 9. *Surfaces* — Cleaned on complaint basis. Repaired or replaced as budget allows.
- ✓ 10. *Repairs* — Should be done whenever safety or function is in question.
- ✓ 11. *Inspections* — Once per week.
- ✓ 12. *Floral planting* — Only perennials or flowering trees or shrubs.
- ✓ 13. *Rest rooms* — When present, serviced a minimum of 5 times per week. Seldom more than once each day.
14. *Special features* — Minimum allowable maintenance for features present with function and safety in mind.

Mode IV

Moderately low level—usually associated with low level of development, low visitation, undeveloped areas or remote parks.

- ✓ 1. *Turf care* — Low frequency mowing schedule based on species. Low growing grasses may not be mowed. High grasses may receive periodic mowing to aid public use or reduce fire danger. Weed control limited to legal requirements of noxious weeds.
2. *Fertilizer* — Not fertilized.
3. *Irrigation* — No irrigation.
- ✓ 4. *Litter control* — Once per week or less. Complaint may increase level above one servicing.
- ✓ 5. *Pruning* — No regular trimming. Safety or damage from weather may dictate actual work schedule.
6. *Disease and Insect Control* — None except where epidemic and epidemic condition threatens resource or public.
- ✓ 7. *Snow removal* — None except where major access ways or active parking areas dictate the need for removal.
8. *Lighting* — Replacement on complaint or employee discovery.
- ✓ 9. *Surfaces* — Replaced or repaired when safety is a concern and when budget is available.
- ✓ 10. *Repairs* — Should be done when safety or function is in question.
- ✓ 11. *Inspections* — Once per month.
- ✓ 12. *Floral plantings* — None, may have wildflowers, perennials, flowering trees or shrubs in place.
13. *Rest rooms* — When present, five times per week.
- ✓ 14. *Special features* — Minimum maintenance to allow safe use.

Mode V

High visitation natural areas—usually associated with large urban or regional parks. Size and user frequency may dictate resident maintenance staff. Road, pathway or trail systems relatively well developed. Other facilities at strategic locations such as entries, trail heads, building complexes and parking lots.

1. *Turf care* — Normally not mowed but grassed parking lots, approaches to buildings or road shoulders, may be cut to reduce fire danger. Weed control on noxious weeds.
2. *Fertilizer* — None.
3. *Irrigation* — None.
4. *Litter control* — Based on visitation, may be more than once per day if crowds dictate that level.
5. *Pruning* — Only done for safety.
6. *Insect and Disease Control* — Done only to ensure safety or when problem seriously discourages public use.
7. *Snow removal* — One day service on roads and parking areas.
8. *Lighting* — Replaced on complaint or when noticed by employees.
9. *Surfaces* — Cleaned on complaint. Repaired or replaced when budget will permit.
10. *Repairs* — Done when safety or function impaired. Should have same year service on poor appearance.
11. *Inspection* — Once per day when staff is available.
12. *Floral planting* — None introduced except at special locations such as interpretive buildings, headquarters, etc. Once per week service on these designs. Flowering trees and shrubs, wildflowers, present but demand no regular maintenance.
13. *Rest rooms* — Frequency geared to visitor level. Once a day is the common routine but for some locations and reasons frequency may be more often.
14. *Special features* — Repaired whenever safety or function are a concern. Appearance corrected in the current budget year.

Mode VI

Minimum maintenance level—low visitation natural area or large urban parks that are undeveloped.

1. *Turf areas* — Not mowed. Weed control only if legal requirements demand it.
2. *Fertilizer* — Not fertilized.
3. *Irrigation* — No irrigation.
4. *Litter control* — On demand or complaint basis.
5. *Pruning* — No pruning unless safety is involved.
6. *Disease insect control* — No control except in epidemic or safety situations.
7. *Snow removal* — Snow removal only on strategic roads and parking lots. Accomplished within two days after snow stops.
8. *Lighting* — Replacement on complaint basis.
9. *Surfaces* — Serviced when safety is consideration.
10. *Repairs* — Should be done when safety or function is in question.
11. *Inspection* — Once per month.
12. *Floral plantings* — None.
13. *Rest rooms* — Service based on need.
14. *Special features* — Service based on lowest acceptable frequency for feature. Safety and function interruption a concern when either seem significant.

Utilizing the Classification Plan to Budget Maintenance Costs for Each Park

Many systems have their own productivity rates they utilize. If not, a reasonable standard can be found in Section II for many of the maintenance tasks necessary. Labor rates and vehicle size will be a variable seldom the same between any two systems. As an example, a mythical area will be selected and its most complex Maintenance Mode will be used as an example. Costs used are only examples and tasks may not reflect all possible functions. Relative completeness is for example purposes only.

Maintenance Budget — *Perfect Plaza* — 5 acres in size

1.	Mow 3 acres turf 1 time per week — 26 weeks	
	Operator \$9.00 per hour, 1 mowing takes 1.5 hrs. x 26 weeks	\$351.00
	72" mower vehicle costs \$1.00 per hour x 1.5 hrs. of use x 26 weeks	39.00
	Aeration of 3 acres twice per year 1.50 hours each	
	Vehicle cost per hour 1.00 x 1.50 hours x 4 times per season	6.00
	6 hours operator time x \$9.00 per hour	54.00
		\$450.00
	Total category No. 1 costs	\$450.00
2.	Fertilizer — contracted fertilizer \$75 per acre x 3 acres x 2 times	\$450.00
3.	Irrigation — automatic	
	Repair — local cost analysis 3 acres @ \$750 per acre	\$2,250.00
	Water cost \$500 per acre x 3 acres	1,500.00
	Power cost \$70 per year	70.00
		\$3,820.00
	Total No. 3	\$3,820.00
4.	Litter control	
	Clean area 5 acres @ rate of .5 acre per hr. per day, 365 days @ \$7.00 per hr.	\$25,550.00
5.	Pruning	
	700 evergreen shrubs @ 1 per hour	700 hrs.
	300 deciduous shrubs @ 2 per hour	150 hrs.
	430 small trees @ 2 per hour	<u>215 hrs.</u>
	Labor rate horticulturist \$10.00	x 1065 hrs.
		\$10,650.00

6. Insect control		
General spraying .25 hrs. per acre x 5 acres = 1.25 hrs. x 4 sprays – 5 hrs.		
5 hrs. operation @ \$11.00 per hour		\$ 55.00
5 hrs. spray machine @ \$2.50 per hour		12.50
Insecticide costs 4 gallons @ \$20 per gallon		80.00
		<hr/>
Total No. 6		\$147.50
7. Snow removal – 84" per year 16 snowfalls		
2400 lineal feet of 10' wide walks	24,000 sq. ft.	
Plaza 40,000 sq. ft.	40,000 sq. ft.	
Removal 24" power blower .10 hr. per		
1000 sq. ft.	604 hrs.	
5 blowers available @ \$1.50 per hr. for		
604 hour total		\$ 906.00
Operator costs \$11.00 per hour x 604 hours		6,644.00
		<hr/>
Total No. 7.		\$7,550.00
8. Lighting		
Repair and replacement contract	\$ 1,500	
Materials – bulbs @ \$122 each x 10	1,220	
Electrical costs per year	<u>3,780</u>	
Total No. 8		\$6,500.00
9. Surfaces		
Sweep 40,000 sq. ft. – 4 hrs. x 20 = 80 x labor @ \$8.00		\$640.00
Wash 40,000 sq. ft. – 8 hrs. x 3 = 24 x labor @ \$8.00		192.00
		<hr/>
Total No. 9		\$832.00
10. Repairs		
General repair functions, benches, trash containers, signs,		
painting 15 hrs. per week x 52 weeks per year @ \$12 per hour		\$9,360.00
Material costs equal labor		9,360.00
		<hr/>
Total No. 10		\$18,720.00
11. Inspections		
Supervisor 1 hour per day average x 210 days x \$16.00 per hour		\$3,360.00
Crew .5 hours per day x 365 days x \$8.00 per hour		1,460.00
		<hr/>
Total No. 11		\$4,820.00

12. Floral painting — 25,000 square feet	
Planting — .17 hours per 1000 sq. ft. x 25 = 4.25 hours @ \$10 per hour	\$ 42.50
Care — 1.0 hr. per 1000 = 25 hrs. x 26 weeks @ \$10 per hour	6,500.00
Preparation and clearing beds	
Preparation 3.3 hrs. per 1000 = 82.5 hours x \$10 per hour	825.00
Cleaning 6.6 hrs. per 1000 = 165.0 hours x \$10 per hour	1,650.00
Spray for pest .30 per 1000 x .25 = 7.50 hrs. x 4 @ \$10 per hour	300.00
Materials — flower 25,000 annuals @ \$2.00 per dozen	4,166.00
Fertilizer 25 lbs. of 12-12-12 per 1000 @ \$.75 per lb.	468.75
Bulbs — Tulips 9000 @ \$145 per 1000	1,305.00
Planting time 9000 sq. ft. @ 4.0 hrs. per 1000 = 36 hrs. @ \$10	360.00
	<hr/>
Total No. 12	\$15,617.25
13. Rest rooms — Contract with janitorial firms, 365 days, twice per day	\$7,300.00
14. Special features	
Fountain — contract for plumbing \$1800 per year	\$1,800.00
Electrical costs per year	800.00
	<hr/>
Total No. 14.	\$2,600.00

BUDGET RECAP MAINTENANCE MODE I CATEGORIES

1.	\$ 450.00
2.	450.00
3.	3,820.00
4.	25,550.00
5.	10,650.00
6.	147.50
7.	7,550.00
8.	6,500.00
9.	832.00
10.	18,720.00
11.	4,820.00
12.	15,617.25
13.	7,300.00
14.	<u>2,600.00</u>

\$105,006.75 Total budget — *Perfect Plaza*

General Fertilizer* Recommendations for Turfgrass

Grass	Lbs. N/1000 sq. ft./season
Common Kentucky Blue	2-4
Improved Kentucky Blue	4-6
Tall fescue	3-5
Fine fescue	2-3
Turf-type perennial rye	4-6
Creeping and colonial bent	4-6
Common Bermuda	4-6
Improved Bermuda	6-8
Zoysia	4-6
Centipede	2-3
St. Augustine	5-6
Bahia	3-4
Buffalo	2-3

*Fertilizer used to supply N often have ratios of *approximately* 1:1:1 to 4:1:1 (N:P O : K O) and the N may be rapidly or slowly available.

Source: Jack D. Butler, Colorado State University

SECTION II

Productivity
Standards

Information provided in this section is the best available data relating to the time it takes to accomplish tasks commonly found in Park and Recreation organizations. Productivity should not be considered as an ideal condition but the average time a competent worker would take to complete the task.

Turf Care

Task	Unit	Time	
		Man Hours	Minutes
<i>Mowing 1 acre, flat medium terrain at medium speed</i>			
18" walking	1 acre	3.0	180.0
20" walking	1 acre	2.8	168.0
24" walking	1 acre	2.2	132.0
30" riding	1 acre	2.0	120.0
36" riding	1 acre	1.0	60.0
48" riding	1 acre	.6	36.0
58/60" (5') riding	1 acre	.5	30.0
72" (6') riding	1 acre	.35	21.0
84" (7') gang	1 acre	.35	21.0
134" (12') gang	1 acre	.16	9.6
Bush hog	1 acre	1.25	75.0
<i>Trim</i>			
Gas Powered (weed eater)	1000 lin. ft.	1.0	60.0
Electric Trimmer	1000 lin. ft.	1.8	108.0
By Hand	1000 lin. ft.	4.2	252.0
<i>Planting Grass</i>			
Cut and plant sod by hand (1-1/2" strips)	1000 sq. ft.	1.0	60.0
Cut sod by machine and plant sq. ft. blocks	1000 sq. ft.	.8	48.0
Cut sod by machine and plant 1-1/2" strips (per sq. ft. of sod area)	1000 sq. ft.	.8	48.0
Cut and plant sprigs by hand (not watered)	1000 lin. ft.	10.9	654.0
Stolons (sprigs) with 1 row mechanical planter	1 acre	.75	45.0
Watering planted stolons	1000 lin. ft.	1.50	90.0
Seed, by hand	1000 sq. ft.	.5	30.0
Overseeding, reconditioning	1 acre	.8	48.0
Fertilizing and timing	1 acre	2.0	120.0
Land Preparation	1 acre	5.3	318.0
<i>Lawn Watering</i>			
Garden hose w/sprinkler	1,000 sq. ft.	.22	13.2
Hoseless, quick coupling plus in sprinklers	1 acre	.45	27.0
50 ft. soaker hoses, plus set up	10,000 sq. ft.	.97	58.2
60 ft. spray sprinkler, plus set up	10,000 sq. ft.	.90	54.0
<i>Fertilize Turf</i>			
24" sifter spreader	1,000 sq. ft.	.16	9.6
	1 acre	7.26	435.6
Cyclone type spreader	1,000 sq. ft.	.05	3.0
	1 acre	2.18	130.8
Hand push spreader 36"	1 acre	2.96	177.6
Tractor towed spreader 8"	1 acre	.64	38.4
Tractor towed spreader 12"	1 acre	.43	25.8
Truck - whirlwind spreader	1 acre	.27	16.2
Liquid fertilizer by truck	1 acre	.19	11.4
Fertilize and lime	1 acre	2.0	120.0

Task	Unit	Time	
		Man Hours	Minutes
<i>Weed Control</i>			
Spraying herbicide w/fence line truck, tank sprayer 2 ft. wide (1" either side of fence)	1,000 sq. ft.	.45	27.0
Non-selective herbicide w/manual equipment, small areas	1,000 sq. ft.	.68	40.8
Selective herbicides w/manual equipment	1 acre	3.0	180.0
Selective herbicides w/tractors operated equipment 20' boom	1 acre	.30	18.0
3 gallon hand pump	1,000 sq. ft.	.25	15.0
Power rig 30" boom	1 acre	2.2	132.0
Sprayer 15' wide	1 acre	.17	10.2
<i>Aerate Turf</i>			
Type of equipment unknown (Source 1)	1 acre	2.0	120.0
Coring type, self-propelled 24" width (Source 2)	1 acre	5.5	330.0
<i>Leaf Removal</i>			
Leaf and thatch removal (manual pick-up spring)	1 acre	1.67	100.2
Leaf and thatch removal (mechanical pick up)	1 acre	1.3	78.0
Hand rake leaves	1,000 sq. ft.	.42	25.2
Tractor operated leaf mulcher	1 acre	.9	54.0
25" push sweeper	1,000 sq. ft.	.08	4.8
30" push sweeper	1,000 sq. ft.	.03	1.8
20-24" push sweeper	1,000 sq. ft.	.16	9.6
Cavex type	1,000 sq. ft.	1.0	60.0
Vacuum 30"	1,000 sq. ft.	.08	4.8
Vacuum 60"	1,000 sq. ft.	.06	3.6
Turf vacuum (towed)	1,000 sq. ft.	.02	1.2

Trees and Shrubs

Task	Unit	Time	
		Man Hours	Minutes
<i>Planting trees</i>			
Plant tree 5-6 ft. ht.	each tree	.45	27.0
Plant tree 5-6 ft. ht. (include watering)	each tree	.70	42.0
Plant tree 2-2½" dia.	each tree	1.0	60.0
Plant tree 2-2½" dia. (include watering)	each tree	1.30	78.0
Planting tree by tree spade	each tree	4.0	240.0
Planting tree by bare root planting	each tree	1.5	90.0

Task	Unit	Time	
		Man Hours	Minutes
<i>Trimming trees</i>			
6" diameter			
by hand	each tree	.5	30.0
by aerial lift truck	each tree	.4	24.0
9" diameter			
by hand	each tree	.8	48.0
by aerial lift truck	each tree	.6	36.0
12" diameter			
by hand	each tree	1.1	66.0
by aerial lift truck	each tree	.8	48.0
18" diameter			
by hand	each tree	1.6	96.0
by aerial lift truck	each tree	1.1	66.0
24" diameter			
by hand	each tree	2.2	132.0
by aerial lift truck	each tree	1.6	96.0
30" diameter			
by hand	each tree	2.7	162.0
by aerial lift truck	each tree	2.1	126.0
36" diameter			
by hand	each tree	3.2	192.0
by aerial lift truck	each tree	2.4	144.0
48" diameter			
by hand	each tree	4.0	240.0
by aerial lift truck	each tree	3.4	204.0
<i>Reforestation</i>			
Hand planting	1 acre	6.16	369.6
Machine planting	1 acre	.88	52.8
Seeding	1 acre	1.54	92.4
<i>Tree Removal</i>			
Street tree removal	each tree	13.0	780.0
Street tree stump removal	each tree	3.5	210.0
Park tree removal	each tree	5.0	300.0
Park tree stump removal	each tree	2.0	120.0
<i>Tree Fertilization</i>			
Punch in soil type (10 yr. old tree)	each tree	.5	30.0
<i>Pest Control</i>			
Power spray	each tree	.30	18.0
Systemic in soil	each tree	.15	9.0
<i>Planting Shrubs</i>			
Plant shrub individually	each shrub	.60	36.0
Plant shrub individually (include watering)	each shrub	.75	45.0
Plant shrubs in a group	each shrub	.30	18.0
Plant shrubs in a group plus watering	each shrub	.40	24.0

Task	Unit	Time	
		Man Hours	Minutes
<i>Shrub Maintenance</i>			
Prune shrubs (deciduous) mature	each shrub	.50	30.0
Prune shrubs (evergreen) mature	each shrub	1.0	60.0
Hedge, trimming by hand, includes clean-up	100 lin. ft.	2.85	171.0
Hedge trimming, electric; includes clean-up	100 lin. ft.	1.50	90.0
Weed, till and edge shrub bed	1,000 sq. ft.	1.0	60.0
Rake shrub bed	1,000 sq. ft.	.85	51.0
Spray herbicide in shrub bed	1,000 sq. ft.	.25	15.0
Spray herbicide in shrub bed after mulching	1,000 sq. ft.	.30	18.0
Mulch shrub bed	1,000 sq. ft.	.5	30.0
Fertilize shrub bed (broadcast)	1,000 sq. ft.	.08	4.8
Winter protection (burlap, snowfence for evergreens)	1 lin. ft.	.05	3.0

Flowerbed/Plantings

Task	Unit	Time	
		Man Hours	Minutes
<i>Flowerbed Preparation</i>			
Cultivating combined shrubbery and flowerbed	100 sq. ft.	.9	54.0
Spring bed preparation	1,000 sq. ft.	3.3	198.0
<i>Planting</i>			
Annuals from a flat	each flat	.17	10.2
Annuals from a flat	1,000 sq. ft.	.10	6.0
Litter pick-up	1,000 sq. ft.	.30	18.0
Weed, no mulch	1,000 sq. ft.	1.0	60.0
Cultivate, no mulch	1,000 sq. ft.	.83	49.8
Mulch	1,000 sq. ft.	.83	49.8
Weed with mulch	1,000 sq. ft.	.03	1.8
Insect and disease inspection	1,000 sq. ft.	.30	18.0
Spray for pests	1,000 sq. ft.	.30	18.0
Fertilize, broadcast	1,000 sq. ft.	.30	18.0
Fall bed clean-up and preparation	1,000 sq. ft.	6.6	396.0

Park Facilities

Task	Unit	Time	
		Man Hours	Minutes
<i>Ballfields</i>			
Mowing—riding with E-10 mower	1 ballfield	.5	30.0
Mowing/trimming with push-behind power mower	1 ballfield	1.0	60.0

Task	Unit	Time	
		Man Hours	Minutes
Seeding ballfield	1 ballfield	3.0	180.0
Drag infield	1 ballfield	.75	45.0
Clean fields, fans area and players areas	1 ballfield	2.0	120.0
Drag infield, line field plus rake	1 ballfield	2.0	120.0
Regrade, repair and reconstruct	1 ballfield	5.0	480.0
Benches, bleachers, check, repair and replace	1 set	24.0	1440.0
Football, soccer field, lining, general maintenance	1 field	2.5	150.0
Goal post repair, replace, install and remove	1 set	16.0	960.0
Fertilize ballfield	1 ballfield	1.0	60.0

Tennis Court/Hard Court Surfaces/Horseshoe Pits

Tennis court, sweep, open drains, clean, vacuum	each set	4.0	240.0
Tennis court winterize/lock, unlock and remove signs and nets	each set	2.0	120.0
Tennis nets, check repairs; repair includes windscreen	each court	1.0	60.0
Tennis practice walls, check, replace, repair, repaint	each set	8.0	480.0
Recoat color surface	each court	32.0	1920.0
Lighting controls, check, replace and repair	each panel	4.0	240.0
Basketball goals and nets, check, replace and repair	each goal	1.0	60.0
Reseal basketball courts	each court	3.2	192.0
Horseshoe pits, check, replace and repair	each pit	8.0	480.0
Bandwagon; set up and take down	each	.80	36.0

Ice Rinks and Sled Hills

Task	Unit	Time	
		Man Hours	Minutes
<i>Ice Rinks & Sled Hill Preparation</i>			
Seal catch basins	each	3.0	180.0
Distribute and remove matting hoses and nozzles	each park	6.0	360.0
Repair dasher boards, erect, paint, dismantle, store	each park	20.0	1200.0
Repair hockey goals, distribute, retrieve, store	each park	5.0	300.0
Make ice	each park	8.0	480.0
Plow, sweep chips, resurface with hose and nozzle	1,000 sq. ft.	1.0	60.0
Sled hills, check, replace, repair	each	16.0	960.0

Swimming Pools

Task	Unit	Time	
		Man Hours	Minutes
<i>Swimming Pool Preparation</i>			
Paint pool and deck (epoxy paint rolled on, including scraping, priming, painting)	1,000 sq. ft.	5.0	300.0
64,000 (1.5 acre total)	each	320.0	19200.0
Caulking—pool and deck	each	120.0	7200.0
Pool and deck equipment, check, replace repair	each	140.0	8400.0
Pool and deck piping, drains, inlets, check, replace, repair	each	240.0	14400.0
Clean all interior surfaces, wash, repair, replace	each	150.0	9000.0
Check, maintain HVAC system, pool H2O, heating systems	each	16.0	960.0
Pre-season filter and boiler room maintenance	each	8.0	480.0
Check and record water quality and quantity used	each	.5	30.0
Winterize pool deck and accessories	each	80.0	4800.0
Winterize pool bathhouse	each	25.0	1500.0
Winterize filter room and boiler room	each	25.0	1500.0
Pool and deck lighting check, repair, replace	each	8.0	480.0
Bathhouse interior, general repair, clean	each	40.0	2400.0
Bathhouse plumbing system, check, replace, repair	each	8.0	480.0
Bathhouse electrical system, check, replace, repair	each	4.0	240.0
Bathhouse lockers, check, repair, replace	per locker	.13	7.8
Bathhouse door and lock check, repair, replace	each	4.0	240.0

Roads/Parking Lots/Trails

Task	Unit	Time	
		Man Hours	Minutes
<i>Road Maintenance</i>			
Make concrete tire stop	1 stop	.9	54.0
Sweep lot	1,000 sq. yd.	.1	6.0
Paint lines in lot (size not given)	1 lot	16.0	960.0
Repair cut and fill slipes	1 mile	.9	54.0
Repair and replace drain pipes	1 mile	1.05	63.0
Clean drain pipes and culverts	1 mile	.30	18.0
Clean and repair unpaved ditches	1 mile	8.0	480.0

Task	Unit	Time	
		Man Hours	Minutes
Clean paved flumes, gutters and inlets	1 mile	2.0	120.0
Mow ditches	1 mile	4.5	270.0
Plow snow	1 mile	3.9	234.0
Grade level	1 mile	3.9	234.0
Add gravel	1 mile	3.0	180.0
Repair bituminous road surfaces (3 laborers, 2 equip. oper.)	1 mile	18.0	1080.0
Seal bituminous and concrete pavement	1,000 sq. ft.	8.0	480.0
Resurface w/bituminous mix	1,000 sq. ft.	22.0	1320.0
Roll or plane bituminous pavements	1,000 sq. ft.	12.0	720.0
Rebuild aggregate base course	1,000 sq. ft.	88.0	5280.0
<i>Walks</i>			
Sweep—by hand	1,000 sq. ft.	.5	30.0
Sweep—power vacuum	1,000 sq. ft.	.15	9.0
Sweep—blower	1,000 sq. ft.	.10	6.0
Snow removal 24" power blower	1,000 sq. ft.	.10	6.0
Snow removal—by hand	1,000 sq. ft.	1.2	72.0
Maintain surface (stone chips, asphalt, concrete)	Linear foot	.25	15.0
<i>Snow and Ice Control</i>			
Remove snow from roadway and shoulders	mile	2.25	135.0
Remove snow from bridges	mile	.06	3.6
Erect snow fences	100 lin. ft.	1.50	90.0
Remove snow fences	100 lin. ft.	1.0	60.0
Sand or salt roadway	mile	.14	8.4
Remove ice from roadway	mile	.4	24.0
Remove snow from ditches and culverts	mile	3.0	180.0
Place or remove sand or cinder barrels	mile	.20	12.0
Paint center, lane or edge lines	mile	6.4	384.0
Paint hazard and/or guide markings	mile	.75	45.0

Picnic and Other Facilities

Task	Unit	Time	
		Man Hours	Minutes
<i>Picnic Facilities</i>			
Distribute/retrieve	each	.5	30.0
Paint, repair, wash	each	5.0	300.0
Park bench—check, replace, repair	each	4.0	240.0
Park bench—paint	each	1.5	90.0
Picnic grill—check and clean	each	.8	48.0
Picnic grill—repair/replace	each	4.0	240.0
Litter barrels—distribute/retrieve	each	.45	27.0
Litter barrels—cleaning	each	.08	4.8

Task	Unit	Time	
		Man Hours	Minutes
Litter barrels—painting	each	1.0	60.0
Drinking fountains—check, repair	each	.5	30.0
Drinking fountains—winterize, turn on, turn off	each	1.5	90.0
Drinking fountain—install new fountain	each	4.0	240.0
<i>Playgrounds (average 10,000 sq. ft.)</i>			
Check, repair	each	2.0	120.0
Paint, stain equipment (300 sq. ft. per gallon)	per gal.	4.0	240.0
Add wood chips, sand, screening	each	10.0	600.0
Refinish monkey bars	each set	12.0	720.0
Lagoons controls—check, repair	each	4.0	240.0
Sewage lagoon maintenance (mowing and testing)	each	70 MH/yr.	4200.0
<i>Machinery Maintenance</i>			
1½ pick-up scheduled maintenance	each time	.75	45.0
Maintenance and repairs to tractor w/implements	each piece	3.5/month	210.0
Maintenance repairs to mowing equipment, hand mower	each piece	1.2/week	72.0

Buildings

Task	Unit	Time	
		Man Hours	Minutes
<i>Buildings</i>			
6 stool comfort station — cleaning and maintenance (2 laborers)	1 building	1.6	96.0
1 modern restrooms (campground) cleaning	1 building	.75	45.0
1 campground shower building	1 building	1.25	75.0
Large double latrine/cleaning	1 building	1.0	60.0
Single latrine/cleaning	1 building	.5	30.0
Open shelter (picnic) building check	1 shelter	.25	15.0
Open shelter (picnic) cleaning	1 shelter	.50	30.0
Enclosed shelter/cleaning	1 shelter	2.75	165.0
Cabin (overnite shelter) cleaning	1 cabin	3.25	195.0
Check-in station/cleaning	1 building	1.0	60.0
Flush restrooms (350 sq. ft.)	per month	11.0	660.0
Flush restrooms with showers (476 sq. ft.)	per month	44.7	2682.0
Valut Toilet (16 sq. ft.)		.7	42.0

Painting

Task	Unit	Time	
		Man Hours	Minutes
<i>Painting</i>			
Large double latrine	each	19.5	1170.0
Single latrine	each	9.5	570.0
Camp shower building	each	35.0	2100.0
Modern restroom	each	16.75	1005.0
Open shelter	each	16.75	1005.0
Enclosed shelter	each	41.75	2505.0
Cabins	each	43.75	2625.0
Check-in buildings	each	14.0	840.0
Spray paint (latex, water base) exterior	1,000 sq. ft. bldg.	1.0	60.0
Spray paint (airless sprayer) (1 hr./gal.) of paint	1,000 sq. ft. surface	2.0	120.0

Miscellaneous

Task	Unit	Time	
		Man Hours	Minutes
<i>Controlled Burning (Large Areas)</i>			
Grasslands	100 acres	6.4	384.0
Woodlands, level terrain	100 acres	1.84	110.4
Woodlands, rolling terrain	100 acres	6.4	384.0
<i>Drainage Channels</i>			
Clean flowline, average of 33 cu. yds./mi.	mile	39.0	2340.0
Repair erosion, average 50 cu. yds./mi. (excavate load, spread, and roll average less than 1 ft. depth)	mile	9.64	578.4
<i>Firebreaks, Maintaining</i>			
Grass and low brush	mile	1.28	76.8
Woodland and tall brush	mile	2.56	153.6
<i>Wildlife Management</i>			
Aquatic weed control	acre	6.4	384.0
Clearing and seeding food plots	acre	3.2	192.0
Fertilizing fish ponds	acre	.8	48.0

Entomology Services

Task	Unit	Time	
		Man Hours	Minutes
Inspection:			
<i>Inspection of buildings for wood destroying pests:</i>			
Slab-on-grade	1,000 sq. ft.	0.50	30.0
Crawl space	1,000 sq. ft.	0.80	48.0
Full basement	1,000 sq. ft.	0.70	42.0
Inspection of buildings for household pests	1,000 sq. ft.	0.30	18.0
Inspection of stored products in warehouses	1,000 sq. ft.	0.50	30.0
Inspection for pests of ornamentals and trees	acre	0.50	30.0
Inspection for pests of greased areas	acre	0.25	15.0
Inspection for rats and mice	1,000 sq. ft.	0.20	12.0
Inspection for field rodents control	acre	0.33	19.8
Control Procedures:			
<i>Treatment of buildings for control of wood destroying pests:</i>			
Slab-on-grade	1,000 sq. ft.	18.00	1080.0
Crawl space	1,000 sq. ft.	16.00	960.0
Full basement	1,000 sq. ft.	20.00	1200.0
Control Procedures:			
<i>Treatment of buildings for household pests:</i>			
Dry storage buildings	1,000 sq. ft.	0.50	30.0
Residential buildings	1,000 sq. ft.	0.80	48.0
<i>Treatment of warehouse for stored products pests:</i>			
Aerosol	1,000 sq. ft.	0.10	6.0
Residual	1,000 sq. ft.	0.33	19.8
Treatment of ornamentals and trees for insect pests	acre	0.80	48.0
Treatment of greased areas for insect pests	acre	1.50	90.0
Larviciding for mosquito control	acre	0.50	30.0
Area adulticiding	acre	0.10	6.0
Fumigation of supplies and equipment	1,000 sq. ft.	0.33	19.8
Rodent control in buildings	1,000 sq. ft.	0.33	19.8
Control of field rodents	acre	0.80	48.0

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SECTION III

Glossary of Park Maintenance Terms

We are experiencing not only a population and technological explosion but also neological proliferation as well; new words, word combinations and terms are infiltrating our professional language every day. Therefore, this glossary may be outdated before it is printed and certainly does not portend to be the end product of an extensive search of dictionaries, encyclopedias, periodicals, manuals and the minds of practitioners but rather the beginning of a dynamic reference piece which can be continually or periodically updated.

This limited glossary of terms was developed to identify some of the more relevant park maintenance management terms for the park and recreation practitioner, as well as students in the field and to define them as simply and accurately as possible, expanding on the definition where clarification was felt necessary, adding committee opinions and biases where they were relevant and useful. To some the approach may be too simplistic but we felt that the information should be of value to beginning students in the field as well as to the experienced practitioner.

The committee reviewed several drafts of the glossary and considered several different formats. The format presented to you is a consensus of the committee and not a unanimous opinion. The committee members listed were the ones who provided input to the project and deserve the credit for actively participating in the process.

The forms of entry and definition used in this publication vary somewhat from standard dictionaries and glossaries.

Index of terms. This is a simple listing of all terms in alphabetical order preceding the glossary. This list will allow the user to quickly determine the form of the main entry for the particular term used, and the group within which the term is found by noting the number following the term.

Glossary. The glossary is divided into sections so that related terms can be logically grouped in alphabetical order. The sections include:

1. General Maintenance
2. Grounds Maintenance
3. Vegetative Maintenance
4. Facilities Maintenance
5. Natural Resource Maintenance
6. Legal Terminology of Maintenance

References. The terminology used in the glossary was derived from many sources and there was no attempt to establish legally binding definitions or official doctrine. Some officially stated definitions may not be in agreement with common usage but they are included because people need to be more aware of them.

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General Maintenance

BASE MAP

A map indicating the significant existing physical features of an area, i.e., streets, rivers, parks, railroads, etc., and serving as a foundation for subsequent mapping and planning.

BENCH MARK

A relatively permanent object, natural or artificial, bearing a marked point whose elevation above or below an adopted datum is known. Usually designated as a BM, such a mark is sometimes further qualified as a PBM (permanent bench mark), or as a TBM (temporary bench mark).

CATCH BASIN

Surface drainage receptacle for collecting rainwater, which is then conducted by drains or conduits to storm sewer system.

CONSERVATION

To manage in a manner which avoids wasteful or destructive uses and provides for future availability; the act of conserving the environment.

CONTOUR INTERVAL

The vertical distance between adjacent contour lines.

CONTOUR LINE

A line on a map or drawing connecting points of equal elevation on the ground.

CRITICAL PATH METHOD

A system of project planning, scheduling and control which combines all relevant information into a single plan, permitting the establishment of the optimum sequence and duration of operations; the interrelation of all the efforts required to complete a construction project are shown; an indication is given of the efforts which are critical to timely completion of the project.

DETAIL DRAWING

A drawing, at a larger scale, of a part of another drawing, indicating in detail the design, location, composition and correlation of the elements and materials shown.

DITCH CHECK

A small dam-like structure built transversely to the ditch centerline for the purpose of reducing discharge velocities and associated soil erosion.

DRESSED SIZE

The dimensions of a lumber or a timber after sawing and planing; usually about 3/8 inch (.95 cm) in thickness or 1/2 inch (1.27 cm) in width less than the indicated size.

ECOLOGY

The branch of Biology that deals with the mutual relations among organisms and between organisms and their environment.

ECOSYSTEM

The living and non-living components of the environment which interact or function together, including plants and animal organisms, the physical environment, and the energy systems in which they exist. All the components of an ecosystem are inter-related.

EFFLUENT

Water solution discharged from a sewage treatment plant. This may also refer to any liquid being discharged from any holding area.

ELEVATION

(1) the altitude of a given point in relation to a given datum; (2) drawing of a building or other development as from a horizontal view without perspective.

FLOOD FREQUENCY

A period of time, within which the probability exists that a discharge equal to or greater than the discharge under consideration will occur.

FLOODPLAIN

The area adjoining a stream, tidal estuary or coast that is subject to intermittent flooding.

GRID

In surveying, two superimposed sets of equidistant parallel lines intersecting at right angles.

HIGH WATER (HW)

Flood stage of stream or lake. Historic HW is stage recorded or otherwise known. Design HW is stage adopted for design, usually based on empirical frequency of recurrence.

HYDRAULIC

Pertaining to water in motion and the mechanics of motion.

HYDRAULIC PROCESSES

Actions resulting from the effect of moving water or water pressure on the bed banks, and shorelands of water bodies (ocean, estuaries, streams, lakes, and rivers).

HYDROLOGIC

Pertaining to the cyclic phenomena of waters of the earth—successively as precipitation, runoff, storage and evaporation, and quantitatively as to distribution and concentration.

INLET TIME

The time required for storm water to flow from the most remote point, timewise, in a drainage area to the point where it enters an inlet.

LIFE CYCLE COSTING

All relevant costs during the life of a product/facility are considered. Used to decide whether or not to make a given investment or to choose between alternative courses of action.

MAINTAIN

Support, keep and continue in an original state or condition without decline.

MAINTENANCE IMPACT STATEMENT

An assessment process used to document impacts on the agencies' maintenance operating budget and organization in terms of dollar costs of operating and maintaining a proposed facility or program. Provides a focus beyond the initial investment to the long term financial and organizational impact of each option considered.

MAINTENANCE PERFORMANCE

A measure of the effectiveness of labor and is a ratio of time allowed, divided by time taken on a series of jobs completed during a given period. (Example: If a job is determined to take 10 hours to do and yet requires 20 hours to complete the performance is only 50 percent.)

MAINTENANCE REQUIREMENTS

Specific criteria established for guidance in carrying out maintenance tasks.

MAINTENANCE STANDARDS

Those activities or individual work elements which support maintenance requirements.

MANAGEMENT UNIT

Any area or group of areas that is managed under a single management plan.

MANHOLE

A vertical entrance by which a man may enter a sewer or other utility system for cleaning or repairing.

MANPOWER

The identification of the number and classification of personnel that it would take to accomplish the tasks within the time frame allotted using the techniques, equipment, and materials specified.

MINIMUM TURNING RADIUS

The radius of the path of the outer front wheel of a vehicle making its sharpest turn.

MOUNTABLE CURB

A curb that can readily be climbed by a moving vehicle.

PLAN, GRAPHIC

A two-dimensional graphic representation of the design, location, and dimensions of the project, or parts thereof, seen in a horizontal plane viewed from above.

POTABLE WATER

Water which is fit for human consumption and satisfies the standards of the appropriate health authorities.

PREVENTIVE MAINTENANCE (PM)

A technique of planning for maintenance using a system of periodic inspections and routine replacement of critical parts to identify and correct faulty conditions. The objective is to minimize breakdowns and to maximize availability.

PROGRAM

Proposed or desired plan or course of proceedings and action.

PUBLIC GAIN

The net gain from combined economic, social, and environmental effects which accrue to the public because of a use or activity and its subsequent resulting effects.

QUALITY

A description of the condition expected upon completion of assigned work. Quality is a derivative of many factors such as considerations of aesthetics and orderliness, health and cleanliness, safety, properly functioning equipment and facilities, as well as conservation and sound environmental practices.

REHABILITATION

The restoration or improvement of deteriorated areas, structures, public facilities or neighborhoods to bring them up to an acceptable standard for use.

RESTORATION

Revitalizing, returning, or replacing original attributes and amenities, such as natural biological productivity, aesthetic and cultural resources, which have been diminished or lost by past alterations, activities, or catastrophic events.

RESURFACING

A supplemental surface or replacement placed on an existing surface to improve its surface conformation or increase its strength.

ROADBED

The graded portion of a highway within top and side slopes prepared as a foundation for the pavement structure and shoulder.

SEAL COAT (Chip Seal)

A surface seal for application on asphalt surfaces on which chips of coarse sand or limestone are spread before the seal has lost its tack or stickiness.

SITE PLAN

A plan of a construction site showing the position and dimensions of structures to be erected and the dimensions and contours of the lot.

SLOPE RATIO

Relation of horizontal distance to vertical rise or fall; e.g., 2 ft. horizontal to 1 ft. vertical is designated 2 to 1 or 2:1.

SUBBASE

The layer or layers of specified or selected material of designed thickness placed on a subgrade to support a rigid slab or base course.

SUMP

(1) A pit, tank, basin, or receptacle which receives sewage or water and which must be emptied by mechanical means (pumping); (2) A reservoir sometimes forming a part of a roof drain; (3) A depression in a roof deck where the roof drain is located.

TASKS

A combination of the operations and activities required to accomplish the work defined in the task descriptions.

THALWEG SLOPE

Slope of a line following the lowest part of a valley or watershed.

TIME

This represents the average time necessary for a qualified craftsman or adequately qualified individual working at a normal pace, following prescribed methods, working under capable supervision, and experiencing only normal delays to perform a defined amount of work of a specified quality.

TOPOGRAPHIC SURVEY

The process of determining the configuration of a surface including its relief and the locations of its natural and man-made features, usually recorded on a drawing showing surface variations by means of contour lines indicating height above sea level.

TOXIC

A poisonous chemical factor that is injurious to animals or plants through contact or systemic action.

UNIT OF WORK

The quantification, in standard units of measurement, e.g., individual numbers, acres, miles, square feet, square yards, of the amount (volume) of work for which the standard applies.

VACUUM BREAKER

A device which will prevent creation of a vacuum in a water-supply system thereby causing backflow.

VALVE

A device which regulates the flow of a fluid.

WEEP HOLE

(1) A small opening in a wall or window member, through which accumulated condensation or water may drain to the building exterior, as from the base of a cavity wall, a wall flashing, or skylight; (2) A hole near the bottom of a retaining wall, backfilled with gravel or other free-draining material, to permit water to drain to the outside of the wall, so as to prevent the buildup of pressure behind the wall.

WORK ORDER SYSTEM

A system of initiating and prioritizing maintenance tasks in which the precise instructions for commencing the job, cost control elements, and the information feedback mechanism for department recordkeeping are present.

WORK PROGRAM (Work Load)

A description of what is to be done, how much is to be done and when it is to be accomplished.

WORK STANDARDS

The level to which work should be performed to accomplish assigned tasks in the most efficient manner that produces both quality and quantity.

Grounds Maintenance

AERIFICATION

Making holes or slits in turf for the purpose of improving or altering physical soil conditions and to stimulate plant growth. Aerification increases air infiltration, water percolation, and plant nutrient mobility into the root zones. A cultural practice used to correct soil compaction.

AMENDMENT

See soil amendment.

ANNUALS

Annuals reproduce by seed and complete their life cycle in less than 12 months, characterized by abundant flowering.

AQUATIC PLANT

A plant that must live partly or entirely in water for at least part of its life cycle.

ARBOR

A light open structure of trees or shrubs or vines closely planted, either twined together and self-supporting or supported on a light latticework frame.

ASEXUAL PROPAGATION

Plant reproduction without the use of seed, as with cuttings, budding, layering, and grafting.

BERM

A mound of earth, length greater than width, constructed as a barrier or an esthetic land form.

BIENNIALS

Biennials produce leafy growth often in a rosette from the seed during the first growing season. They are dormant during the winter and in the second season develop stalks with flowers and seeds. Plants live more than 12 months but less than 36 months.

BROADLEAF PLANTS (also called dicots)

Plants with leaves in which the veins are almost never parallel. These plants tend to have wider leaves than grass-like plants such as lilies, iris, palms, orchids, etc.

BULB

A subterranean bud having fleshy scales like an onion.

CALCIUM CHLORIDE

A granular salt-based chemical sometimes applied to earthen paths and roads to settle dust. Also used as a de-icing agent on pavement. This material is toxic to plants and should be applied with care in their proximity.

CAPILLARY WATER

Water held in the capillaries of the soil which clings to the soil particles either when free water passes through the soil or by capillary attraction from a wetter stratum.

CHLOROSIS

Yellowing of green portions of a plant, particularly the leaves.

CLAY

A minute soil particle less than 0.002 millimeters in diameter.

CLONE

An individual plant propagated asexually from another individual.

CONCENTRATE

A condensed formulation usually diluted with water or oil before use. Also, in a product name, the strongest commercially available formulation of the active ingredient.

CONCENTRATION

The amount of active ingredient in a given weight of a mixture or volume of a solution. Recommendations and specifications for concentration of agricultural chemicals are frequently given on the basis of pounds per unit volume or mixture or solution.

CORM

A vertical, thickened, solid, underground stem such as borne by a crocus or gladiolus.

CREOSOTE

(1) An oily liquid toxic to fungi, insects, and living plants and people, obtained by distilling coal, used to impregnate wood (as a preservative), to water-proof materials, and to retard weathering and checking of wood; (2) A plant used for landscaping in southwest U.S.

CULTIVAR

A variety of plant denoting an assemblage of cultivated individuals which are distinguished by a significant characteristic, and which when reproduced (sexually or asexually) retain their distinguishing feature.

CUT AND FILL

The process of excavating and moving the excavated material to another location and using it as fill to adjust the surface grade.

CUTTING

A severed part of a plant for rooting to form a new plant (see clone).

DECIDUOUS

Leaves all falling at the end of the growing season or at least withering up and becoming lifeless.

DEFOLIANT

A material that causes the leaves to fall from plants; e.g., a spray used to remove leaves from cotton plants just before harvest.

DORMANCY

A seasonal recession of plant growth, normally caused by shortness of days (winter), cold, or drought. Unless accompanied by extreme or adverse conditions, this annual "hibernation" is essential to the best growth of many perennial plants.

DORMANT

Not in an actively growing condition, but capable of becoming such under proper conditions.

EMULSIFYING AGENT

A material that helps to suspend globules of one liquid in another, e.g., oil in water.

EMULSION

A mixture in which one liquid is suspended in minute globules in another liquid, e.g., milk or an oily preparation in water.

EXOTIC

A plant or other organism which has been introduced from other regions.

FERTILIZER

A natural or manufactured material added to the soil in order to supply one or more plant nutrients. The term is generally applied to largely inorganic materials other than lime or gypsum sold in the trade.

FILL

The placement by man of sand, sediment, or other material, usually in submerged lands or wetlands, to create new uplands or raise the elevation of land.

FINISH GRADE

The top surface of lawns, walks, and drives, or other improved surface after completion of construction or grading operations.

FIXED RETAINING WALL

A retaining wall which is rigidly supported or laterally braced at its top and bottom; can withstand higher pressures than a freestanding wall.

FLOODWAY

The normal stream channel and the adjoining area of the natural floodplain needed to convey the waters of a regional flood.

FOUNDATION PLANTING

Plants massed close to the foundation of a structure.

FRIABLE

Soil easily crumbled or pulverized; easily reduced to powder.

GRADIENT

(1) The degree of inclination of a surface, road, or pipe, often expressed as a percentage; (2) A rate of change in a variable quantity, as temperature or pressure; (3) A curve representing such a rate of change.

GROUT

(1) Thin mortar used for filling in the joints of masonry, brickwork, or brick or stone pavements; (2) Thin mortar pumped into the ground to rectify expansive clay problems or to seal off sub-surface drainage.

HARD PAN

A hardened, relatively impervious layer in the soil.

HARDINESS

Capability of a plant to survive in a given environment.

HERB

A flowering plant whose above ground stems are destitute of woody tissue and perish when flowers and fruit (seed) mature.

HERBACEOUS

A stem that is not woody like those of trees and shrubs.

HERBACEOUS PLANT

A plant that remains soft or succulent and does not develop woody tissue.

HERBICIDE

Poison used to kill herbaceous or other plants. Any compound used to kill or inhibit the growth of a plant.

(NONSELECTIVE) HERBICIDE

Chemical or formulation which destroys or prevents plant life in general without regard to species.

(NONSYSTEMIC) HERBICIDE

Chemical or formulation which works without being ingested into the plant. In most cases no residual results.

(SYSTEMIC) HERBICIDE

Chemical or formulation which works through translocation into the vascular system of the plant and is capable of killing plant parts other than those on which it is sprayed.

HUMUS

Decomposed or partially decomposed organic matter in or on the soil, frequently of a dark color.

HYBRID

A plant resulting from a cross between parents of different species, sub-species, or varieties.

INDIGENOUS

Native, or belonging to a region or an area. The opposite of exotic.

INORGANIC

Substances occurring as minerals in nature or obtainable from them by chemical means.

LEACHING

(1) The washing out of soluble nutrients from the soil. Occurs naturally in areas of high rainfall, may require replacement of food elements (especially nitrogen), and correction of acidity, which comes from the leaching out of Alkaline salts. Leaching is sometimes done intentionally to rid soil of a detrimental salt or an overdose of inorganic nitrogen; (2) The sub-surface disposal of septic tank effluent into the ground, i.e., leach field disposal.

LOAM

The textural class name for soil having a moderate amount of sand, silt and clay. Loam soils contain 7 to 27 percent clay, 28 to 50 percent silt and less than 52 percent sand.

MULCH

A layer of organic or inorganic material put on the soil for one or more of the following reasons: to reduce water losses from the soil by impairing evaporation, reduce runoff, reduce compaction, help to control weeds, add organic matter to the soil, moderate soil temperature fluctuation, or for ornamental purposes.

NOXIOUS WEED

A weed or plant defined as being especially undesirable, troublesome, or difficult to control.

OILS

References are usually to aromatic or paraffinic oils used in formulating products such as diluents or carriers for herbicides. Dormant oil is used to smother insects that overwinter on a plant.

OUTCROP

Rock appearing on or above the surface of the surrounding soil.

OVERHAUL

The transportation of excavated material beyond a specified limit.

PERENNIAL ROOT

One that lives over winter and initiates the stem growth from buds. Such a root must be large enough to store enough food to start the new growth in the spring.

PERENNIALS

Perennials live more than 2 years and can persist indefinitely within specific climatic ranges. A plant that is a perennial in one climate may be used as an annual in another climate.

PERMEABILITY

(1) The property of soil, rock, or mantle which permits water to flow through it; (2) The property of a porous material which permits the passage of water vapor through it.

Ph.

A scale from 0-14 used to distinguish relative degrees of acidity or alkalinity within soils. Above 7.0 is alkaline, below 7.0 is acid.

PLANTING EASEMENT

An easement for reshaping roadside areas and establishing, maintaining and controlling plant growth thereon.

POSTEMERGENCE TREATMENT

Treatment made after a plant emerges. Contact preemergence treatment is made after weed emergence but before crop emergence.

RATE OR DOSAGE

These terms are synonymous. Rate is the preferred term and usually refers to the amount of active ingredient material applied to a unit area (such as one acre or 1000 sq. ft.), regardless of percentage of chemical in the carrier.

REMONTANT

Blooming a second time in a season.

REPOSE, Angle of

The gradient or slope at which a given material will establish itself if dumped freely from grade.

RESIDUAL

Capable of having a continued killer effect over a period of time.

RESTORATION, Active

Involves the use of specific positive remedial actions, such as removing fills, installing water treatment facilities, rebuilding deteriorated urban waterfront areas, rehabilitating strip mined areas, reestablishing prairies, etc.

RESTORATION, Passive

Is the use of natural processes, sequences, and timing or which occurs after the removal or education of adverse stresses without other specific positive remedial action.

RETAINING WALL

A wall, either freestanding or laterally braced, that bears against an earth or other fill surface and resists lateral and other forces from the material in contact with the side of the wall.

RHIZOME

A prostrate more or less horizontally elongated stem growing partly or completely beneath the surface of the ground and usually rooting at the nodes and becoming upcurved at the apex.

RIPRAP

(1) Irregularly broken and random-sized large pieces of quarry rock; individual stones ranging

from very large (2 to 3 cubic yards, approximately 1.5 to 2.3 cubic meters) to small (1/2 cubic ft., approximately 0.014 cubic meters); used for foundations and revetments; (2) A foundation or parapet of stones thrown together without any attempt at regular structural arrangement.

RISER

(1) The vertical face of a step or stepped ramp; (2) In irrigation: a short piece of pipe used to connect the irrigation head with the water supply line.

ROLLING

The process of compacting turf or soils, usually by mechanical means; the leveling of uneven turf or soils surfaces.

ROOT

The descending axis of the plant, without nodes and internodes, absorbing nutrients and moisture from the ground, and may store food.

SEDIMENT

Deposit made by suspended material settling out of a liquid.

SITE DRAINAGE

Removing water from a site by surface or subsurface drainage.

SLUDGE

The solid part of sewage after treatment. Can be used as a soil amendment because of organic content and fertility.

SOIL AMENDMENT

A chemical or mineral element added to the soil to improve soil characteristics such as: porosity, aeration, drainage or moisture retention.

SOIL COMPACTION

The process of increasing soil density primarily as a result of excessive wear. In compacted soils particles are pressed or packed together with fewer large air pores or interstices existing.

SOIL CONDITIONER

A material which when added to compacted soil, tends to make it loose, crumbly, or porous.

SOIL FERTILITY

The ability of a soil to supply nutrients in sufficient quantity to meet the growth requirements of plants, when other growth factors are favorable.

SUBGRADE

(1) The soil prepared and compacted to support structure or a pavement system; the base portion of any surfaced area, the elevation of which is lower than that of the finished grade; (2) The elevation of the bottom of a trench in which a sewer or pipeline is laid.

SUBSOIL

The bed or stratum of earth which lies immediately below the surface or top soil.

TERRESTRIAL

A plant growing in the air with its basal parts in wet or dry soil; or a term related to land.

THATCH

Thatch is an intermingled layer of living and dead stems, leaves and roots of grasses, which develops between the layer of green vegetation and the soil surface.

TILTH

In reference to soil capability which is easily crumbled and has a good organic content or to the physical condition of the soil.

TIME OF CONCENTRATION

The time required for storm runoff to flow from the most remote point.

TOLERANCE

The relative capacity of a plant or species to withstand cold, heat, wind, sunlight, etc.

TOPDRESSING

The practice of spreading a thin layer of soil, sand, compost or humus material on its surface.

TOPSOIL

The surface or upper layer of soil, as distinct from the subsoil; usually contains more organic matter.

TRANSPIRATION

The giving off by the plant, mainly through its stomata, of water in vapor form, into the atmosphere.

TUBER

A thickened subterranean stem typically with numerous eyes like a potato.

VALVE, CHECK (Back-Pressure Valve, Reflux Valve)

An automatic valve which permits liquid to flow in only one direction.

VEGETATIVE PROPAGATION

The propagation of plants through asexual means—such as budding, cuttings, division, grafting, layering, etc., as distinct from sexual production as by seed or spores or bulbs.

VERTICAL MOWING

Vertical mowing (verticutting) is cutting by blades or tines which move perpendicular to the soil surface. Specifically designed to thin turf they control turf grain and aid in controlling and eliminating thatch.

VIABLE

Fertile, in terms of a plant's capacity to germinate or grow; alive. A viable seed will sprout under moist or other special conditions, according to the type of seed.

VINE

A plant climbing or scrambling on some other support. Such a plant may support itself by tendrils or aerial roots.

WATER TABLE

The upper surface of ground water.

WEED

A weed is a plant growing where it is not desired, i.e., a weed is a plant out of place. In practice, we understand a weed as a wild, not intentionally sown or planted plant which grows between cultural plants and is harmful because of competition for light, moisture and plant nutrients.

WET FEET

Plant roots trying to grow in soil which is continually saturated with water. While bog plants can usually survive under such conditions, most garden plants will perish.

WETTING AGENT

A substance capable of lowering the surface tension of liquids, facilitating wetting of solid surfaces, and permitting the penetration of liquids into the capillaries.

WOOD PRESERVATIVE

A chemical used to prevent or retard the decay of wood, especially by fungi or insects.

Vegetative Maintenance

ARBORETUM

A place where trees and related plants are grown for scientific and educational purposes.

ARBORICULTURE

The growing of, and caring for, trees for aesthetic purposes, such as specimen trees, street trees, and shade trees.

BALLED AND BURLAPPED (B&B)

Plants prepared for transplanting by digging them so that the soil immediately around the roots remains undisturbed. The ball or earth is then bound up in burlap or similar mesh fabric.

BELOW

Warning call given by tree trimmer or topper when dropping a piece of brush or wood.

BRUSH CONTROL

Control of woody plants and brush usually by herbicides or weed killers or mechanical methods.

BUCKSTRAP

Leather strap or 5/8 inch diameter rope fastened onto a climber's safety belt or tree saddle. Has a large snap-hook to fasten onto D-ring after being passed around tree limb or pole.

BULL-LINE (Bull-Rope)

Work rope, often 3/4 or 1 inch diameter used to pull up and lower large limbs or sections of trees. Used with snatch block and truck for heavy loads. Light loads often pulled by two or three men with a third snubbing the running part of the rope around the trunk of a nearby tree. Use of hydraulic crane units and towers have eliminated the need for much of this technique.

BULL SAW

A heavy duty saw used by climber. Teeth usually include both cutters and rakers as in a crosscut saw. One-man light weight chainsaws have taken place of most such saws.

BUTT ROPE

Work rope 3/8 or 1/2 diameter depending on size of limb-tied around a limb to be cut, placed 6 inches above the cutting place tied with clove hitch or often with running bowline. When cut is made this rope enables the butt end to be lowered

easily from a crotch or controlled by using a pull rope.

CABLE STRETCHER

This one sounds a bit like a left-handed monkey wrench, but is used in installing cable to repair trees. When loghooks have been properly placed on a hook, the cable-stretcher is fastened with ropes to the other limb just below the hook. The cable is placed in the come-along clamp of the cable stretcher and the handle worked on a ratchet (like a bumperjack) until the cable is pulled properly snug. Then the other end is spliced around the lag hook and the cable-stretcher is removed.

CALIPER

Tool for rolling and lifting (with two cant hooks) logs. A heavy handle has an iron hook hinged on about 8 inches above an ironshod tip. Similar to a peavv, but has a flat toothed end instead of a pike point.

CHERRY-PICKER

Hydraulically operated aerial tower. Usually mounted on a large truck. Line crews use some as short as 35 ft. for clearing cables and streetlights. Most forestry departments use 45-55 ft. towers for trimming and removal operations. Sometimes to replace burned out floodlights at the ball parks.

CROTCHED IN

Safety climbing rope or work rope passed through an open crotch (so the rope will move freely without burning) high in the tree. From a well chosen crotch a climber can swing from one part of the tree to the other in complete safety.

D.B.H. (Diameter Breast High)

This was the standard height (actually about 4-1/2 ft.) for measuring the diameter of a tree. It was measured this high to avoid the flaring effect of the buttress roots on the methods used for estimating the amount of lumber in a tree. The diameter can be measured by the cruiser with calipers or a diameter tape.

DOUBLE-CROTCHING

When a climber has tied into one crotch and then uses the tail (opposite end) of his climbing rope to tie in around another crotch on the other side of

the tree. This enables him to move across the top of the tree (as he must in installing cables) without a lot of shinneying. This technique is also used to provide a more stable work position for extensive surgery or repair work.

DROP-CROTCHING

Technique of trimming used in line clearing or when the top of a tree must be reduced for any reason. Instead of clipping the tops off a certain level, the cuts are made to a lower crotch so that the vigor of the tree continues to flow into the side limb instead of forcing a cluster of fast growing sprouts back up into the wires. The wound left from drop-crotch pruning heals much faster with less chance of invasion by wood-rot fungi than the stubs that were all too often left with the "butchering" type of pruning.

EVERGREEN

A plant or tree that retains its verdure through all the seasons, as the pine and other coniferous trees, the holly, rhododendron, etc.

EXFOLIATE

To peel off in scales, layers or thin plates as bark from a tree trunk.

GAFFS

These are the pieces of sharp metal fastened to the spurs or climbing irons. They are designed to penetrate easily, not "cut out" to the side, and to come out easily when the climber takes another step.

GIN POLE

A tall section of a tree to be removed with one or more strong open crotches. It should be as close to the center of the tree as possible to aid in roping down sections of the tree. With large sections a bull-rope is used with a snatch block. A dependable gin pole may be impossible to find in a dead or dying tree. The hydraulic crane units are now used in much the same way and are much safer in case of dead, dying or storm-damaged trees.

GINK

The number two man on a tree crew. This man is one of the most experienced crew members and usually takes the place of the foreman if he must leave the job for a while.

GIRDLE

A circle made by removing or constricting the bark around the main trunk of a tree. Because it

severs the xylem and phloem which conduct the "life blood" of the tree, the tree usually dies.

GIRDLING ROOT

This is root that has changed normal direction and has grown around the trunk or larger roots of a tree. The pressure exerted can become very high and the "tourniquet effect" cuts off the flow of food moving down through the inner bark (phloem) and up through the sapwood (xylem). Often this happens naturally, but care is needed when planting a bare root tree to avoid bending roots when turning a tree into position. When planting a container grown tree, some roots will usually be found growing around the edge of the can. These should be cut or straightened to prevent eventual girdling.

GRAFT

Asexual method of plant propagation wherein a growing part of one plant (called "scion") is affixed upon the growing stock of another. For success, it is essential that the two cambium layers join. The plant produced is a clone, faithful to the characteristics of the scion.

GRUNT

Ground man who picks up brush and services the climber with tools and equipment.

HANGER

A storm-broken limb, or one cut by trimmer or topper that does not fall to the ground, but remains hanging in the tree as a possible hazard to people, vehicles, houses, or utility wires. Such storm-broken limbs should receive priority over broken limbs on the ground. One of the last things a tree trimmer should do is to make a final check to be sure that all hangers from his trimming or line-clearing have been removed from the tree. After a new trimmer has climbed a few trees for the second time to "get the hangers" he seldom forgets.

HEADS UP

Warning call given by tree trimmer or topper before he lets a piece of brush or limb wood fall to the ground.

INCREMENT BORER

Swedish tool having a T-handle, a sharpened hollow bit and core-remover. It is used to "see inside" of a living tree. It is used to take out a small core of wood about 3/16 inch in diameter. From this you can count annual rings, determine rate of growth (check effect of watering, fertilizing, etc.);

diagnose disease; wetwood, verticillium wilt (green or brown spots), Dutch Elm disease (brown spots), etc.; determine extent of wood rot.

MONKEYFIST

Type of knot tied in the end of a throw line (1/4 or 3/8 inches) to make it easier to throw over a limb or through an open crotch.

NOTCHING

Technique used in felling trees or in cutting off large limbs so that the log falls in a certain direction. Two saw cuts are made, the first horizontal cut from 1/3 to 1/2 of the diameter. The second cut is made from above at about a 45° angle to meet the first so that a wedge shaped section is removed. When the wood on the opposite side is cut (back cut) the tree will begin to lean and the remaining wood will start to break (stop cutting and yell "Timber-r-r"). The tree or log will fall at about 90° to the base of the notch. If the back cut is made at a slight angle so that more wood is left on the left or right side, the tree will swing in that direction before it breaks off.

PEAVY

Tool for turning, rolling, lifting logs, especially when floating in water. Has a heavy hook hinged about 8 inches above an iron-shod tip. Similar to cant hook except that it has a pike point on the end instead of a flat toothed plate.

PERGOLA

Open garden structure enclosing part of a path or walk. Vines or pleached trees often trained overhead.

PLEACH

To train and interlace the tops of trees or other plants to form an archway over an alley or walkway.

PLUG

Short piece of limb left when a large limb is removed by the three-cut method (see *stub*).

PRUNING

Removal of dead, diseased, unnecessary or unwanted twigs and branches from plants, or for shaping/ornamental practice.

SADDLE

Safety equipment that is worn around the waist with loops for legs of climber. Originally made of rope with padding around back and under legs. Now made in various styles of canvas, nylon,

leather, equipped with D-rings or other method for attaching the climbing rope and/or buck strap. Other rings or snap fasteners are used for attached handsaw in scabbard, paint can, and sometimes chisels and other tools for surgery and repair. Should be inspected daily for signs of damage or wear.

SHINNEY

Method of climbing where there are no limbs to climb on. Unlike climbing with spurs, the body is kept close to trunk. (1) The climber reaches high and grasps trunk or limb with both arms; (2) pulling up with his arms, he arches back and grasps trunk with legs. One leg goes around the opposite side of the trunk and the calf of the leg is pressed against the trunk. The other leg is placed with the knee and thigh against the trunk. The shin bone (hence "shinney") and ankle are placed against the near side of the trunk with the toe extending around opposite the knee; (3) gripping the trunk with the legs takes the weight off the arms; and (4) they are extended as the body straightens and a fresh grip taken—the climber repeats until he reaches a limb.

SHRUB

A woody plant smaller at maturity than a tree and usually with several basal stems.

SNATCH-BLOCK

A special block constructed so that the casing can be opened on one side to receive a loop of rope around the pulley. This eliminates the need of threading the rope through the block. These blocks are used with a bull rope to "pull-up" large sections of a tree during removal operations. The block is chained to the trunk. The rope is tied onto the limb, run through the crotch of the gin pole, down through the snatch block and is fastened to the truck used to pull up the limb after it has been cut part way off. Once the limb is pulled up it is cut off completely. Often a butt rope is used to help guide it down as the truck slowly moves forward to let it down.

SNUBBING

Technique used to control work rope. The running end of the rope is given one or two turns around a limb or the trunk of the tree. The friction of the rope absorbs the pull of the limb being lowered to the ground so that the climber or ground man can control a weight that his arms alone could not hold. Care must be used so that the friction does not "burn" the rope. Snubbing is also used in "pulling up" limbs. In this case

the bull rope is pulled up a few inches at a time and the "snubber" takes up the slack and holds it while the men pulling get a fresh grip or rest.

SOIL AUGER

Tool for boring into the ground. It is usually about 1-1/2 inches in diameter, three feet long and may be shaped to take a wooden T-handle about 2 feet long. It can also be made for use with a power drill. It is used to take soil samples, check for fill or other changes in the normal soil profile which could affect aeration and drainage around and through the root system of an existing tree, or to make a quick check of a proposed planting site. It can be used to check for a suspended sub-soil gas leak, or to make holes for fertilizer, deep-watering, or, when filled with peat moss, improved aeration.

SPURS

Tools used for climbing. Developed and used by linemen for climbing utility poles, these climbing irons are often worn by climbers for removing trees. Since the gaffs leave a wound in the tree at every step, they should not be used for trimming or repair work. Spurs are fastened to the inside of the leg below the knee with straps at knee and ankle. The gaff is in position on the inside of the instep. The climbing technique with spurs is almost opposite to that used by a climber who is shinnying up a tree. Climbing with spurs the knee is inclined away from the trunk or limb to prevent the gaff from "cutting-out."

STUB

Short piece of limb left when a limb or twig is removed by pruner, or saw when using the three-cut method. Also used to describe the standing trunk after the foliage and limbwood have been "topped-out."

SWINGBOARD

A wooden seat used by climber in place of saddle or bowline when an extensive amount of work must be done. Seat or "swingboard" is put into a bowline or double-bowline (one loop goes around the waist). The free end used to tie taut-line hitch on the up-rope so that the climber may control his position in the tree.

TAXONOMY

That branch of science dealing with description, naming, and classification of types or kinds of plants.

THREE-CUT METHOD

Technique for removing limbs when pruning to prevent the limb from peeling the bark down the trunk and creating a larger wound. (1) Limb is undercut about a foot from trunk. Rule of thumb is to "cut until the saw pinches."; (2) The next cut is made from the top a few inches further out. If the limb is heavier than the climber can hold, a butt rope should be tied on and snubbed to the trunk or to another crotch nearby. This cut is made until the limb breaks off leaving a stub or "plug."; (3) The final cut is made close to the trunk to promote rapid healing of the wound. Since new growth takes place parallel to the sap flow the flush cut heals easily from the edges. Very little healing will take place when a stub is left.

THROWING KNOT

A knot made in the end of a light (1-1/4-3/8 diameter) work rope or climbing rope (1/2 inch diameter) so that it may be thrown high into the tree or from one part of the tree to another. Weight is needed to carry the rope through foliage and let it drop down through a crotch to the ground. Two types of knots are used: (1) the "closed knot" like the monkey-fist that remains tied and weights the end of the rope as it is whipped through the crotch, gradually dropping the rope within reach; (2) the "open" or slipper knot in which (a) the rope is wound onto the arm a sufficient number of turns, then (b) a half-dozen wraps are taken around the loops to hold them and finally (c) a loop is pulled through the top of the loops. This loop becomes the throwing handle and pulls out (or is pulled out) once the rope is through the crotch. This releases the wrapping turns and the rope unwinds and falls to the ground (or within reach without the need of whipping a long length of rope through the crotch).

TIMBER-R-R

This warning cry of the woods is well known, but is still very functional in that it alerts all persons in the area that a tree, trunk or large section is to be dropped. It is an important safety measure since unexpected things may always happen when several tons of wood hit the ground.

TOPIARY

The cutting and trimming of shrubs and trees, especially evergreens, into odd or ornamental shapes, thus producing an effect entirely different

from that produced by the natural growing habits of the plant.

TOP OUT

Technique involving the removal of brush and pole wood leaving only the trunk and main scaffold of branches standing. This is used during storm emergencies, so that once the broken tree is "safe" the crew moves on to another emergency. It may also be used when the trunks are to be removed, stumps and all, by bulldozer as part of a construction process. Finally, crews may be organized for greater efficiency by using a task force of climbers with a tower truck to top-out and another crew with a crane truck to fall the trunk and load the logs.

TRACING

Technique of trimming the edges of a wound with hooked knife, sometimes mallet and chisel as well, back to "tight" bark. All loose ends should be removed. This not only removes shelter for insects, and lodging places for fungus spores, but also removes the temptation for children to grasp the loose end and rip loose a far greater piece. General practice indicates that tracing the wound to an oval with "pointing" at top and bottom make a good looking job. Recent studies of healing, however, indicate that shape has no real bearing on the speed of healing.

TREE

A woody plant of considerable stature at maturity with one or few main trunks.

WATER LANCE

Tool for watering tree roots below surface of sod or packing. Made of 1/2 inch pipe with a faucet handle and a T-handle capped at one end and equipped with a fitting for power sprayer or garden hose at the other. With sprayer liquid fertilizer can be applied directly to the feeder root zone.

WEDGE-AND-SLEDGE

Technique for removing stumps. The roots were chopped back with 5 pound axes. Then slabs were split off using iron wedges and 12 pound sledges. This was often much harder than it sounds. Some stumps were twisted, full of rocks, even iron nails, etc. In most cities this method has been replaced by the use of power stump cutters.

WIDOW-MAKER

Usually the result of poor planning when felling trees, this name is given a tree that does not fall clear to the ground when cut, but catches the twigs and branches (hangs-up) in a nearby tree or trees. This can happen because of improper notching, an unseen rotted spot, an unexpected gust of wind, etc. It is a menace if left hanging and is more dangerous than ever to the men who must finish the removal of the tree. Such trees often result from storm breakage.

WOODY

A perennial stem that has had time to produce woody tissue, a characteristic bark which is often gray to tan and buds that produce the next season's growth.

WOODY PLANT

A plant which develops woody tissue, retaining its essential shape from season to season, with normal growth. The opposite of herbaceous plant, whose top dies to the ground in winter.

Facilities Maintenance

ALTERATION

A change or rearrangement in the structural parts of a building or in its facilities. An alteration may include repairs and replacements but is distinguished from them by the fact that repairs and replacements do not entail a change in partitions or in other parts of the structure.

ASPHALT

(1) A dark brown to black cementitious material, solid or semisolid, in which the predominating constituents are bitumens which occur in nature; (2) A similar material obtained artificially in refining petroleum; used in built-up roofing systems as a waterproofing agent; (3) A mixture of such substances with an aggregate for use in paving.

ASPHALTIC-CONCRETE, Paving, Black Top

A mixture of asphalt and graded aggregate widely used as paving material over a prepared base; normally placed, shaped and compacted while hot, but can be mixed and placed without heat.

CAPITAL IMPROVEMENT

Any substantial physical facility built by the public or any major non-recurring expenditure. The construction of schools, highways, sewer and H₂O systems, the landscaping of a park are all capital expenditures as distinguished from operating costs.

CEMENT

A material or a mixture of materials (without aggregate) which, when in a plastic state, possesses adhesive and cohesive properties and hardens in place.

CONCRETE

A composite material which consists essentially of a binding medium within which are embedded particles or fragments of aggregate; in portland cement concrete, the binder is a mixture of portland cement, water and stone.

CONCRETE BLOCK

A hollow or solid concrete masonry unit consisting of portland cement and suitable aggregates combined with water.

CORROSION

The deterioration of metal or of concrete by

chemical or electrochemical reaction resulting from exposure to weathering, moisture, chemicals, or other agents in the environment in which it is placed.

DEVELOPED AREA

An area of land on which site improvements such as grading and utility installation have been made and buildings are erected.

EFFLORESCENCE

An encrustation of soluble salts, commonly white, deposited on the surface of stone, brick, plaster, or mortar; usually caused by free alkalies leached from mortar or adjacent concrete as moisture moves through it.

EXPANSION JOINT

(1) A joint or gap between adjacent parts of a building, structure, or concrete work which permits their relative movement due to temperature changes (or other conditions) without rupture or damage; (2) An expansion bend.

EXPOSED AGGREGATE FINISH

A decorative finish for concrete work; achieved by removing the outer skin of mortar, generally before the concrete has fully hardened, and exposing the coarse aggregate.

FINE AGGREGATE

That portion of an aggregate which passes through a 4.76-mm (No. 4) sieve and is predominantly retained on a 74- μ m (No. 200) sieve.

FOOTING

That portion of the foundation of a structure which transmits loads directly to the soil; may be the widened part of a wall or column, the spreading courses under a foundation wall, foundation of a column, etc.; used to spread the load over a greater area to prevent or reduce settling.

FOUNDATION

(1) Any part of a structure that serves to transmit the load to the earth or rock, usually below ground level; the entire masonry substructure; (2) The soil or rock upon which the structure rests.

MACADAM, TARMAc, TARMAcADAM

(1) A paving for roads or other surfaces, formed

by grading and compacting layers of crushed stone or gravel; then the top layer(s) are usually bound by asphaltic material, acting to stabilize the stone, provide a smoother surface, and seal against water penetration; (2) The crushed stone used in a macadamized surface.

PRECAST CONCRETE

A concrete member that is cast and cured in other than its final position.

REBAR

A steel bar having ribs to provide greater bonding strength when used in reinforced concrete.

SANITARY SEWER

A sewer carrying only domestic sewage.

STORM SEWER

A sewer for conveying storm and surface water only.

STRUCTURE

Anything constructed or installed or portable, the use of which requires a location on a parcel of land.

Natural Resource Maintenance

ACCRETION

The build-up of land along a beach or shore by the deposition of waterborne or airborne sand, sediment, or other material.

AVULSION

(1) A tearing away or separation by the force of water; (2) Land which is separate from upland or adjacent properties by the action of a stream or river cutting through the land to form a new stream bed.

CARRYING CAPACITY

Level of use which can be accommodated and continued without irreversible impairment of natural resources productivity, the eco-system and the quality of air, land and water resources.

COASTAL SHORELANDS

Those areas immediately adjacent to the ocean, all estuaries and associated wetlands, and all coastal lakes.

DRAINAGE AREA

A physical horizontal area within a watershed, contributing to a specific point on the channel.

HIGH INTENSITY RECREATION

Uses specially built facilities, or occurs in such density or form that it requires or results in a modification of the area of resource. Campgrounds, golf courses, public beaches, and marinas are examples of high intensity recreation.

INTEGRITY

The quality or state of being complete and functionally unimpaired; the wholeness or entirety of a body or system, including its parts, materials, and processes. The integrity of an ecosystem emphasizes the inter-relatedness of all parts and the unity of its whole.

LITTORAL DRIFT

The material moved, such as sand or gravel, in the littoral (shallow water near shore) zone under the influence of waves and currents.

LOW INTENSITY RECREATION

Does not require developed facilities and can be accommodated without change to the area of

resource. For example, boating, hunting, hiking, wildlife photography, and beach or shore activities can be low intensity recreation.

SHORELINE

The boundary line between a body of water and the land, measured on tidal waters as mean higher high water, and on non-tidal waterways at the ordinary high water mark.

STILLING BASIN

An energy or velocity dissipator of water which uses a stilling pool for primary dissipation.

WATER-DEPENDENT

A use or activity which can be carried out only on, in, or adjacent to water areas because the use requires access to the water body for waterborne transportation, recreation, energy production, or source of water.

WATER-RELATED

Uses which are not directly dependent upon access to a water body, but which provide goods or services that are directly associated with water-dependent land or waterway use, and which, if not located adjacent to water, would result in a public loss of quality in the goods or services offered. Except as necessary for water-dependent or water-related uses or facilities, residences, parking lots, spoil and dump sites, roads and highways, restaurants, businesses, factories, and trailer parks are not generally considered dependent on or related to water location needs.

WETLANDS

Land areas where excess water is the dominant factor determining the nature of soil development and the types of plant and animal communities living at the soil surface. Wetland soils retain sufficient moisture to support aquatic or semi-aquatic plant life. In marine and estuarine areas, wetlands are bounded at the lower extreme by extreme low water; in freshwater areas, by a depth of six feet. The areas below wetlands are submerged lands.

Legal Terminology of Maintenance

AGREEMENT

(1) A meeting of minds; (2) A legally enforceable promise or promises between two or among several persons; (3) On a construction project, the document stating the essential terms of the construction contract which incorporates by reference the other contract documents; (4) The document setting forth the terms of the contract between the architect and owner or between the architect and consultant.

APPROVED EQUAL

Material, equipment or method approved by the client for use by the contractor as being acceptable as an equivalent in essential attributes to the material, equipment or method specified in the contract documents.

ATTORNEY-IN-FACT

A person authorized to act for or in behalf of another person or organization, to the extent prescribed in a written instrument known as a Power of Attorney.

BID

A complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein, supported data called for by the bidding requirements.

BID BOND

A form of bid security executed by the bidder as principal and by a surety. See also Bid Security.

BID DATE

The date established by the client for the receipt of bids.

BID FORM

A form furnished to a bidder to be filled out, signed and submitted as his bid.

BID SECURITY

The deposit of cash, certified check, cashier's check, bank draft, money order or bid bond submitted with a bid and serving to guarantee to the owner that the bidder, if awarded the contract, will execute such contract in accordance with the bidding requirements and the contract documents.

BIDDER

One who submits a bid for a prime contract with the owner, as distinct from a sub-bidder who submits a bid to a prime bidder. Technically, a bidder is not a contractor on a specific project until a contract exists between him and the owner.

BIDDING DOCUMENT

The advertisement or invitation to bid, instructions to bidders, the bid form and the proposed contract documents including any addenda issued prior to receipt of bids.

CHANGE ORDER

A written order to the contractor signed by the owner and the architect issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or contract time. The contract sum and contract time may be changed only by change order. A change order signed by the contractor indicates his agreement therewith, including the adjustment in the contract sum or the contract time.

CONTRACT

An agreement between two or more parties, to do or not to do a particular thing.

CONTRACTOR

The bidder awarded the contract for the work.

DUE CARE

The degree of care which a reasonably prudent person would exercise under the same or similar circumstances.

EASEMENT, Conservation

An easement acquired by the public and designed to protect privately owned lands for recreation purposes or to restrict the use of private lands in order to preserve open space and protect certain natural resources.

EASEMENT, Scenic

The grant or sale by a landowner to an agency of the right to use his land for scenic preservation or enhancement. The easement bars the owner from changing the use of appearance of his land without the agency's consent.

ETHICS

Useages and customs regarding the moral and professional duties of a professional toward others.

EMINENT DOMAIN

The power or right of a governmental unit (federal, state or local) to take private property for public use, just compensation to the owner.

GENERAL CONDITIONS

That portion of a contract for construction which remains essentially the same for every project.

GENERAL CONTRACT

The principal or prime contract in a construction project; the agreement between the owner and the general contractor.

GUARANTEE

A standard of performance.

INSPECTION

An examination; careful scrutiny to insure compliance.

LABOR AND MATERIAL PAYMENT BOND

A bond of the contractor in which a surety guarantees to the owner that the contractor will pay for labor and materials used in the performance of the contract. The claimants under the bond are defined as those having direct contracts with the contractor or any subcontractor.

LETTER OF INTENT

A letter signifying an intention to enter into formal agreement, usually setting forth the general terms of such agreement.

LIABILITY

An obligation that one is bound in law or justice to perform; the condition of being actually or potentially subject to an obligation.

LIEN

A right enforceable against specific property to secure payment of an obligation.

LIQUIDATED DAMAGES

A sum specified in a contract whereby damages in the event of breach are predetermined. In construction contracts, liquidated damages usually are specified as a fixed sum per day for failure to complete the work within a specified time. If set at a level consistent with a reasonable forecast of actual harm to the owner, liquidated damage

clauses will be upheld and will preclude use of standards for computation of damages that would otherwise be imposed by law. If the amount prescribed for liquidated damages is unreasonably high, the provision will be denominated an illegal "penalty" by the courts and held invalid; in such case, damages will be determined pursuant to otherwise applicable rules of law.

LITIGATION

A lawsuit or judicial controversy.

MECHANICS LIEN

A claim that attaches to improvements on real property and to the land itself for the purpose of securing priority of payment for the value of work, labor or services performed or materials furnished in making improvements to the property.

MEDIATION

The act of a third person who attempts to persuade two or more parties to a dispute to adjust or settle their problem.

NEGLIGENCE

The failure to exercise that degree of care which a reasonably prudent person would exercise so as not to submit others to unreasonable risks of harm. *Contributory negligence* is the want of ordinary care on the part of the person injured which concurred with a defendant's negligence and was a cause of the injured party's damage. *Comparative negligence* is a doctrine of law wherein the concurrent negligence of a plaintiff and a defendant is compared and the plaintiff's damages are diminished proportionally to his fault.

NEGOTIATION

A discussion of the terms of a proposed agreement between the parties to the agreement.

NOTICE TO BIDDERS

The official notice included in the proposal for inviting bids for the proposed road improvement.

NOVATION

The substitution of a new contract for an existing valid contract between the same or different parties.

PERFORMANCE BOND

A bond of the contractor in which a surety guarantees to the owner that the work will be performed in accordance with the contract documents. Except where prohibited by statute, the Performance

Bond is frequently combined with the Labor and Material Payment Bond.

PROFESSIONAL STANDARD OF CARE

That degree of skill or care usual in a particular profession.

PROPOSAL

An offer; a proposal becomes a contract when the terms and conditions of the proposal have been accepted by the other party.

REAL PROPERTY

Land, everything growing on it, and all improvements made to it. It usually includes rights to everything beneath the surface, and at least some rights to the airspace above it.

REASONABLE MAN

The fictitious person that is used to measure the standard of care that must be exercised to avoid negligence.

RIGHT OF WAY

The areas existing or acquired by permanent easement for highway or utility, or other purposes; also, the areas acquired by temporary easement during the time the easement is in effect.

SPECIAL PROVISIONS

Specific directions, provisions, requirements, and revisions of the specifications peculiar to the work under consideration which are not satisfactorily provided for in the specifications. They set forth the final contractual intent as to the matter involved. The special provisions included in the contract shall not operate to annul those portions of the specifications with which they are not in conflict.

SPECIFICATIONS

The body of directions, provisions, and requirements authorized and printed by the department, together with written agreements and all documents of any description made or to be made pertaining to the method or manner of performing the work, the quantities, or the quality of materials to be furnished under the contract.

STATUTE OF LIMITATIONS

They are statutes declaring that no suit shall be maintained on a cause of action unless brought within a specified period of time after the right to bring suit accrues.

STRICT LIABILITY

Liability without negligence.

SURETY BOND

A legal instrument under which one party agrees to answer to another party for the debt, default or failure to perform of a third party.

TORT

Any civil wrong, not arising out of contract, for which the law provides a remedy, such as negligence, defamation, assault and battery, etc.

TORT FEASOR

A person or entity who commits or is guilty of a tort.

VANDALISM

The willful or malicious destruction or defacement of property.

WAIVER OF LIEN

The voluntary relinquishment of one's lien rights.

ZONING, Aesthetic

The regulation of property by zoning in the interest of beauty.

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