

Denver  
Parks + Recreation

Planning,

Design +

Construction

Standards

# TABLE OF CONTENTS

<b>1. Understanding DPR</b> .....	<b>1-1</b>
1.1 How to Use the DPR Standards .....	1-1
1.2 City & County of Denver Parks & Recreation Department.....	1-2
1.2.1 Responsibilities Of DPR .....	1-2
1.2.2 The People Of DPR .....	1-3
1.2.3 DPR Community Partnerships .....	1-3
1.2.4 DPR's Governing Rules & Advisors.....	1-3
1.2.5 DPR's Project Funding.....	1-3
1.3 Park Definition, Typology & Habitat.....	1-5
1.3.1 Park Definitions and Criteria.....	1-5
1.3.2 Floristic Regions, Life Zones and Typologies & Habitat .....	1-8
1.4 Process To Update DPR Standards .....	1-11
1.5 Sustainable Mission .....	1-11
<b>2. Projects: Planning, Design &amp; Construction</b> .....	<b>2-1</b>
2.1 Project Management .....	2-1
2.2 Phases 1-3: Determining Needs and Funding .....	2-2
2.3 Phases 4-5: Planning & Design .....	2-2
2.4 Phases 6-10: How a Project is Built.....	2-2
2.5 Project Review .....	2-2
2.6 Product Expectations.....	2-2
2.7 Applying for a DPR Standard Variance .....	2-2
2.8 As-Built and AutoCAD Requirements .....	2-2
2.8.1 Submittal Process:.....	2-3
2.8.2 Requirements:.....	2-3
2.9 Adoption Process Hierarchy .....	2-3
<b>3 . Design &amp; Development</b> .....	<b>3-1</b>
3.1 Site Analysis & Site Work.....	3-1
3.1.1 Site Analysis.....	3-1
3.1.2 Surveying.....	3-3
3.1.3 Site Work.....	3-3
3.1.4 Site Preparation.....	3-3
3.1.5 Grading & Drainage .....	3-3
3.2 Infrastructure .....	3-5
3.2.1 General Requirements.....	3-5
3.2.2 Infrastructure Extensions To Serve Park Facilities .....	3-5
3.2.3 Infrastructure Located Within ROW Adjoining Park Land.....	3-9
3.2.4 Utility Corridors.....	3-9
3.2.5 DPR Energy & Water Usage .....	3-9
3.3 Hardscape .....	3-11
3.3.1 Walkways .....	3-11
3.3.2 Stairs & Ramps .....	3-12
3.3.3 Plazas .....	3-12
3.3.4 Mow Strips .....	3-12
3.3.5 Parking Lots .....	3-13
3.3.6 Private Park Roads.....	3-14
3.4 Landscape .....	3-15
3.4.1 Turf .....	3-16
3.4.2 Planting Beds (Shrubs, Perennials, Groundcover) .....	3-17
3.4.3 Park Trees.....	3-17
3.4.4 Natural Areas.....	3-18
3.4.5 Street/Plaza Trees .....	3-20
3.4.6 Parking Lot Landscaping .....	3-21
3.4.7 Landscape Maintenance.....	3-21

3.5 Irrigation.....	3-23
3.5.1 General Requirements.....	3-23
3.5.2 Sources Of Water.....	3-24
3.5.3 Isolated Systems.....	3-25
3.5.4 Water Meter, Point Of Connection & Backflow Device.....	3-25
3.5.5 Irrigation Heads.....	3-26
3.5.6 Irrigation Controls.....	3-27
3.5.7 Installation (Trenching, Piping, Sleeving, Wiring).....	3-27
3.5.8 Valves & Valve Boxes.....	3-29
3.5.9 Thrust Blocks.....	3-30
3.5.10 Pump Stations.....	3-30
3.5.11 Water Conservation Devices.....	3-31
3.6 Structures.....	3-33
3.6.1 Shelters.....	3-34
3.6.2 Kiosks.....	3-35
3.6.3 Toilet Enclosures.....	3-35
3.6.4 Ballfield Dugout Cover & Pressbox.....	3-35
3.6.5 Restroom Facilities.....	3-35
3.6.6 Portable Restroom Facilities.....	3-36
3.6.7 Concession Facilities.....	3-37
3.6.8 Maintenance Facilities & Work Stations.....	3-37
3.6.9 Recreation Centers.....	3-39
3.6.10 Bus Shelters.....	3-39
3.6.11 Amphitheaters.....	3-39
3.6.12 Historical Structures.....	3-40
3.6.13 Park Ornamental Structures (Trellises/Pergolas/Arbors/Privacy Screening/Gateways/Arcades/Portals).....	3-40
3.6.14 Boat/Fishing/Dock Facilities.....	3-40
3.6.15 Bridges.....	3-41
3.6.16 Pavilions.....	3-41
3.7 Program Elements.....	3-43
3.7.1 Trails.....	3-43
3.7.2 Playgrounds.....	3-49
3.7.3 Athletic Fields & Courts.....	3-51
3.7.4 Dog Parks.....	3-56
3.7.5 Skateparks.....	3-57
3.7.6 Disc Golf.....	3-58
3.8 Furnishings.....	3-59
3.8.1 Picnic Tables.....	3-59
3.8.2 Park Benches.....	3-59
3.8.3 Drinking Fountains.....	3-60
3.8.4 Barbecues.....	3-60
3.8.5 Bicycle Racks.....	3-60
3.8.6 Trash Receptacles.....	3-60
3.8.7 Trash Dumpsters.....	3-61
3.8.8 Fences.....	3-61
3.8.9 Fence Gates.....	3-62
3.8.10 Walls.....	3-62
3.8.11 Signage.....	3-62
3.8.12 Lighting.....	3-65
3.9 Water Features & Lakes.....	3-69
3.9.1 Water Features.....	3-69
3.9.2 Lakes & Ponds.....	3-70
3.10 Art in Parks.....	3-73
3.11 Parkways and Boulevards.....	3-75
3.12 Medians and Traffic Islands.....	3-77
4.0 Maintenance.....	4-1

## TABLE OF FIGURES

<b>1. Understanding DPR .....</b>	<b>1-1</b>
Figure 1.3.1 Park Definition, Typology & Habitat.....	1-5
Table 1.3.2.1 Lifezones.....	1-9
Table 1.3.2.2.....	1-10
Figure 2.1.1 10 Project Phases .....	2-1
<b>2. Projects: Planning, Design &amp; Construction.....</b>	<b>2-1</b>
Figure 2.9 Adoption Process Hierarchy.....	2-4
Figure 2.3.2 How a Project is Planned: Planning Process.....	2-5
Figure 2.2.1 Determining Needs & Funding for Projects .....	2-6
Figure 2.3.1 Initiating a Project: Writing a Scope & Selecting a Consultant.....	2-7
Figure 2.3.3 How a Project is Designed: Design Development & Construction Document.....	2-8
Figure 2.4.1 How a Project is Built.....	2-9
Figure 2.5.1 Internal Design Review Process.....	2-10
Figure 2.5.2 Public Meeting Process.....	2-11
Figure 2.6.1 Document Requirements: Planning/Design Process.....	2-12
Figure 2.6.2 Document Requirements: Construction Documents.....	2-13
Figure 2.6.3 Document Requirements: Planning Booklets & Design Reports .....	2-14
Figure 2.6.4 Document Requirements: Operations & Maintenance Manual.....	2-15
Table 2.4.2 Built Design Checklist.....	2-16
Table 2.4.3 The Official “Who’s Gonna Do What” Checklist (MOU DPR & PW) .....	2-17
Table 2.4.3 The Official “Who’s Gonna Do What” Checklist (MOU DPR & PW) .....	2-18
Table 2.4.4 DPR Standards Checklist .....	2-19
<b>3 . Design &amp; Development.....</b>	<b>3-1</b>
Table 3.1.5.1 Grading Requirements .....	3-3
Table 3.2.2.1 Park Infrastructure .....	3-6
Table 3.2.2.2 Utility Depths.....	3-7
Figure 3.2.3 UDFCD Urban Storm Drainage Criteria Manual: BMP Planning Flow Diagram.....	3-8
Table 3.3.1.1 Walkway Layout.....	3-11
Table 3.3.5.1 Zoning Code Parking Class.....	3-13
Table 3.3.5.2 Parking Guidelines.....	3-13
Table 3.4.0.1 Minimum Planting Sizes .....	3-15
Table 3.4.0.2 Vegetation Installation & Protection Period .....	3-16
Table 3.4.4.1 Natural Area Classifications .....	3-19
Table 3.5.1.1 Irrigation Design.....	3-23
Table 3.5.1.2 Vegetation Watering Schedule.....	3-24
Table 3.5.1.3 Hydrozones.....	3-24
Table 3.5.7.1 Vertical Pipe Clearances .....	3-28
Table 3.6.1.1 Shelter Amenities .....	3-34
Table 3.6.1.2 Shelter Amenities .....	3-34
Table 3.6.8.1 District Maintenance Facility.....	3-38
Table 3.7.3.1 Tier A Athletic Fields.....	3-51
Table 3.7.3.2 Tier B Athletic Fields .....	3-52
Table 3.7.3.3 Athletic Field & Court Design.....	3-52
Table 3.7.3.4 Baseball/Softball Elements .....	3-53
Table 3.7.3.5 Multi-use Field Elements .....	3-54
Table 3.7.3.6 Court Elements.....	3-54
Table 3.8.1.1 Guidelines for Accessible Seats at Picnic Tables.....	3-59
Table 3.8.11.1 Signage.....	3-64
Table 3.8.12.1 Light Spacing Distances .....	3-65
Table 3.8.12.2 Pedestrian Lighting.....	3-66
Table 3.11. 1 Review Responsibility Table .....	3-75

## Appendix

Appendix A DPR Organization Chart .....	ii
Appendix B Colorado Vegetation Full Document .....	iv
Appendix C Variance Form .....	viii
Appendix D DPR Approved Street Trees .....	x
Appendix E Executive Order No. 87 .....	xiv
Appendix F DPR Structures .....	xviii
Appendix F DPR Structures .....	xix
Appendix F DPR Structures .....	xx
Appendix G Trail Information .....	xxx
Appendix H Off-leash Dog Area Application .....	xlvi
Appendix I Signage Details .....	xlix
Appendix J Gifts/Sponsorships/Naming Request Policy.....	lxi
Appendix K Fountain Requirements for Equipment and Vault Facilities.....	lxii
Appendix L DPR Water Features .....	lxvii
Appendix M DPR Art in Parks.....	lxviii
Appendix N Executive Order for Standards.....	lxx
Attachment 1 Greenprint Denver Office and Sustainability Policy .....	lxxi
Attachment 2. Project Sustainability Form .....	lxxii

## Acknowledgements

### Executive Committee:

Bader, Stu; Baird, Susan; Barney, Michael; Blew, Gregg; Buckels, Devon C.; Dennis, Eric D. - HR/CR; Douville, Donna - PW Transportation; Encinias, Richard; French, Keith; Fry, Susan; Gannon, Dick; Goering, Chani; Hawkey, Tom; Herwig, Britta; Ittelson, Ellen T. - CPD; Johnson, Scott C. - Department of Law; Kitts, Kelly; Luhan, Alice; Marsh, Juan; Reed, Kaye L.; Romero, Dave; Schooley, Pam; Schwarz, Sid; Swanson, Michael; Webster, Val; Weinstein, Gayle; Wheeler, Patrick A. - Department of Law; Woods, Douglas.

Prepared By: Jill (Petrick) Wuertz

### Denver Parks & Recreation:

Manager: Kim Bailey,

Deputy Manager of Parks & Planning: John C. Overstreet

Deputy Manager of Recreation & Facility: Daniel Betts

Planning, Design & Construction Director: Andrea G. Riner

Parks Director: Douglas Woods

Natural Resources Director: Jude O'Connor

Recreation Directors: Dody Ericson, Michael Barney, Dolores Moreno

### Plan Adoption:

Foreword: The goals of this Standards document were to

- Provide minimum design guidelines for all DPR Parks
- Give a clear and consistent message to other city departments on standards involving park land and all the primary responsibilities of DPR Department
- Create standard details that make maintenance easier and more efficient
- Establish a more accurate on-bid unit cost with the use of standard details
- Standardize the appearance of common elements in DPR's parks without limiting opportunities for creativity and uniqueness in our parks
- Gather data to provide one information source that is up-to-date for planners, superintendents and consultants
- Provide information up-front to planners/consultants to reduce time spent on projects and create more consistent construction documents
- Give an overview of DPR's parks to all planners, users and partners of Denver Parks & Recreation
- Provide opportunities to increase sustainable practices within DPR

Putting this information together would not have been possible without the exceptional examples of other cities that we used for reference, especially the City of San Diego and Seattle. The Time Saver Standards for Landscape Architecture were also helpful in giving an overview on the variety of issues that should be addressed on a topic by topic basis. Thank you to our Executive Committee who worked to find successful compromises on a number of issues. Finally, a special thank you to Tom Hawkey who patiently answered all of my questions and taught me about our wonderful park system.

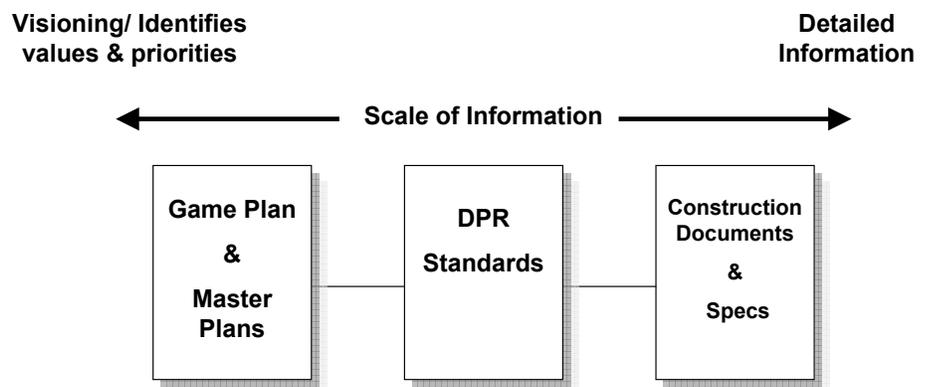
# 1. Understanding DPR

DENVER PARKS & RECREATION
Mission: As stewards of Denver’s legacy, the Department of Parks and Recreation is dedicated to customer satisfaction and enhancing lives by providing innovative programs and safe, beautiful, sustainable places.
Vision: To be a nationally recognized leader providing model programs and dynamic public spaces.
Values: Accountability . Honesty . Respect . Service . Stewardship . Teamwork . Trust .

## 1.1 How to Use the DPR Standards

On April 21, 2003, the Denver Parks and Recreation Game Plan was adopted by City Council as a supplement to the City’s Comprehensive Plan. Denver residents and the City worked for over two years to complete this first adopted strategic plan for Denver’s parks, recreation facilities, and natural open spaces. The Game Plan idea of Denver as a City in a Park is a 50-year vision and strategic framework plan. The DPR Standards document is a tool designed to complement the Game Plan by organizing design, planning and construction efforts while Denver transforms into a City in a Park. The Standards put into physical form the park policy and action strategies of sustainability, equity, engagement and sound economics as outlined in the Game Plan.

The DPR Standards is structured to guide the design process and should be used by all those who participate in creating Denver parks that are safe, beautiful and sustainable places. The DPR Standards apply to all parks, right-of-way in parks, parkways and medians, natural areas and facilities maintained by the Department of Parks & Recreation.



## 1.2 City & County of Denver Parks & Recreation Department

Denver's parks and recreation facilities are unrivaled in the Rocky Mountain West. They embrace nearly 3,000 acres of "traditional" parks and parkways and 2,500 urban natural acres in the city alone, with an additional 14,000 acres of spectacular mountain parks. On the drawing boards are an additional 334 acres of neighborhood and community parks and 1,100 acres of natural areas at Stapleton and Lowry. Its 29 recreation centers, seven municipal golf courses, and nationally recognized cultural attractions, such as the Denver Zoo, the Denver Botanic Gardens, Historic Four Mile House, Red Rocks and the Buffalo Bill Museum, serve millions of visitors annually.

### Denver's Park Planning:

1858-1859: the City Block Plan
1878: Sopris Lee Plan
1894: Rollandet Plan
1906-1907: Robinson Kessler Plan
1914: Olmsted Mountain Parks Plan
1929: DeBoer Plan
2003: Game Plan

The system's 135-year history spans from the first park, a single block that two savvy developers donated to the city in 1868 to create Curtis Park, to nearly 20,000 acres of urban parks and mountain parkland in 2003.

Our parks capture all that is the essence of Colorado, from sand-hill prairie along First Creek in far northeast Denver to fragile tundra at the peak of Mt. Evans. They span nearly 100 miles, 8,700 feet in elevation change, and five ecosystems.

But Denver also is a highly urban park system. In fact, the city owes much of its urban form and character to the tree-lined streets, parkways, boulevards, and parks that were designed in the late-19th and early-20th centuries. Parks give each Denver neighborhood a social heart, an identity and, often, a name.

Parks are about recreation — people "re-creating" themselves away from work and home. Denver is a city of people who like to play and enjoy the outdoors. In survey after survey, Denver residents credit parks, open space, and recreational opportunities for our high quality of life, a close second only to our sunny skies and great weather.

Change is the constant in park and recreation trends and the pace has quickened. People now skate, run, and jog past people strolling. The few street-corner jungle gyms of our early history have evolved into our 29 recreation centers and incredible citywide recreation programs. (Game Plan p. 2)

### 1.2.1 Responsibilities Of DPR

The following are examples of the duties and powers vested exclusively in the Department of Parks and Recreation under the City Charter (Subtitle B, Article II, Part 4).

- Management, operation and control of all facilities, either within or without the territorial limits of the City and County, owned by the City and County for park and recreational purposes;
- Building line restrictions around parks and parkways;
- Licenses, privileges and concessions in all parks and recreational facilities and on the streets and sidewalks within three hundred feet of the boundary of any park or recreational facility;
- Landscaping of public ways and thoroughfares;
- Cooperative agreements with School District No. 1 and other public and

---

private agencies for the development of park and recreational facilities, programs and activities, and for the establishment and maintenance of the museums, zoological or other gardens, collections of natural history and observatories.

### 1.2.2 The People Of DPR

DPR's organization chart (see Appendix A) illustrates the roles and management structures within the department. The Denver Park System is divided into six Urban Districts and one Mountain Parks District. Recreation, Parks, Natural Resources, Planning/Design/Construction, Golf, Marketing and Communications, and Finance and Administration are the principal divisions within the department.

The Denver Zoo, Denver Botanic Gardens, Four Mile House, Winter Park, and Cableland are cultural facilities of the Parks and Recreation Department. Because they are independently managed, the DPR Standards do not apply to these organizations.

### 1.2.3 DPR Community Partnerships

In recent years, due to budget shortfalls and aging infrastructure, new types of complex partnerships are becoming even more important in the delivery of services to the public, i.e., conservancies, corporate sponsorships, or collaborations with the many non-profits providing programs and events in parks and centers. Currently, Denver Parks and Recreation has partnerships with over 160 organizations and agencies. DPR also participates in partnerships with community-based non-profits who have their roles clarified through memorandums of understanding (MOU) with the department. These organizations include Civic Center Conservancy (2005), City Park Alliance (1999), Denver Mountain Parks Foundation (2004), South Platte Greenway Foundation (1974), and The Park People Foundation (1970).

DPR also has an extensive partnership with Denver Public Schools, primarily in after-school programs, summer camp programs, and facility management. Both agencies are working to treat school yards and parks as joint civic campuses to serve the public better and to effectively use tax dollars.

### 1.2.4 DPR's Governing Rules & Advisors

In accordance with the City Charter, DPR has adopted and administers policies, rules and regulations which can be judicially enforced through City Ordinances.

The Manager of Parks and Recreation is appointed by the Mayor and is a member of the Mayor's Cabinet (Subtitle B Charter Art. II. Pt.4). The Parks and Recreation Advisory Board is established by the Charter and advises the Manager on various matters (Subtitle B Charter Art. II. Pt. 4.). DPR also presents issues and projects to other groups, including City Council, Registered Neighborhood Groups, and other city departments.

### 1.2.5 DPR's Project Funding

Park projects can be funded in several distinct ways: through the annual Capital

Improvement Program (CIP) with annual revenues; through special district financing such as tax-increment financing (TIF) funding (Stapleton, Lowry), Local Improvement Districts (part of Skyline Park); grants; or city debt financing ((certificates of participation, general obligation Bonds (e.g. 1998 Bond Program)); or revenue bonds. DPR also applies for and receives private donations and government grants for projects

Annual CIP: Denver’s Capital Improvement Program (CIP) provides funding for both the acquisition of new assets and the repair and rehabilitation of existing fixed assets from revenues that the City receives on an ongoing annual basis. (Capital equipment is separate from the CIP and is budgeted through the operating budget process.) The funding sources for annual capital are separated into the following funds:

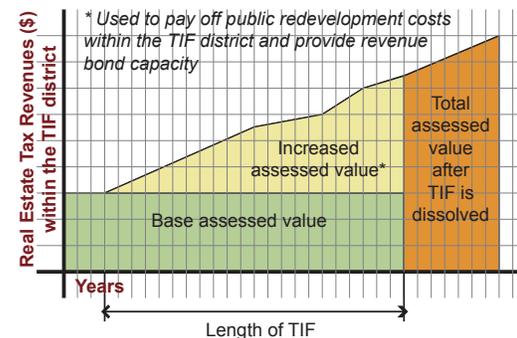
- Winter Park Fund (revenues from the Interwest’s operation of the Winter Park Ski Area and dedicated solely to use on DPR projects);
- State Conservation Trust Fund ( funds from the Lottery allocated by formula based on population and dedicated to DPR projects);
- Capital Improvements Fund (occupational privilege tax, land sales, and other miscellaneous income);
- Entertainment and Cultural Capital Fund ( surplus seat tax on tickets at City venues dedicated to Theatres & Arenas projects).

Grants: Grants for DPR come primarily from Great Outdoors Colorado (GOCO) and the Colorado Historical Society. Other funding mechanisms for grants are federal, state and private entities.

City Debt Financing: (general obligation bonds; certificates of participation (COP); and revenue bonds ) General obligation bonds require a vote of the electorate to authorize the financing and generally include a number of projects. The electorate votes to tax themselves through property tax to repay the bonds. Certificates of Participation do not require a vote of the electors but also do not raise new money. They are paid from existing revenues of the Capital Improvement Funds. Revenue bonds do not require a vote but are paid from new or existing revenues. Only agencies such as Golf or Wastewater, which are organized as Enterprise entities (deriving revenues from fees rather than taxes), may issue revenue bonds.

Special District Financing: ((Tax increment financing districts (TIF); local improvement districts; metropolitan districts; general improvement districts))

DURA (Denver Urban Renewal Authority) Districts or Tax-Increment Financing (TIF) Districts. TIF is used only when an area or property can’t be redeveloped without public investment and when it meets a public objective, and then only to fill the gap between the total project cost and the level of private financing the project can support. In the case of developer reimbursement, the amount of money reimbursed depends on the success of the project, with the developer receiving reimbursement only if the project creates the extra value for the City. TIF captures the new tax revenue (property and/or sales taxes) generated at



*Diagram of TIF financing*

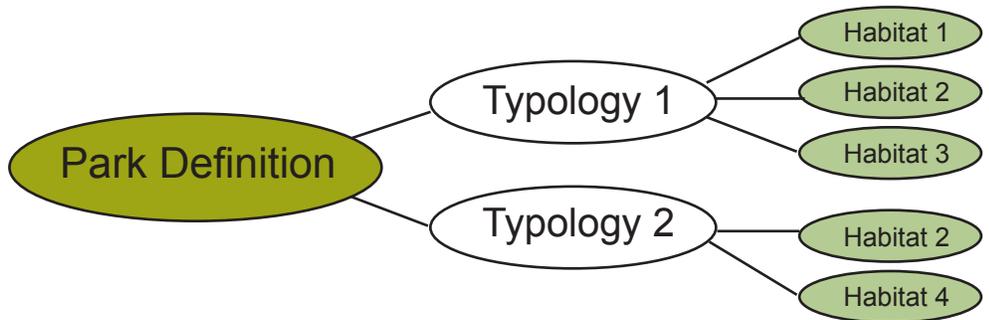
the site and uses that revenue to pay back either (a) bonds issued by DURA, or (b) developer advances for the project. The new tax revenue that is created must be used for improvements that have a public benefit and that support the redevelopment effort, such as site clearance, streets, utilities, parks, the removal of hazardous materials or conditions, or site acquisition.

Metropolitan Districts. For large area developments such as Stapleton, Cherokee, Green Valley Ranch, and Central Platte Valley, the developer may, with permission of the City and a vote of the affected property owners create a metropolitan district that can build streets, parks, sewers, water lines, streetscapes, etc. Metro districts then assess the property owners a defined mill levy on their property to pay back bonds or developer advances. Impact fees or development fees can be levied for public infrastructure that benefits a development. These may be vehicles used by the metropolitan district or assessed by the City within a new growth area and administered by the City or the district.

Local Improvement Districts or General Improvement Districts: These are used for local development when the property owners agree to tax themselves to fund an improvement.

### 1.3 Park Definition, Typology & Habitat

It is important to understand the definition, type, and habitat of a park before planning begins. The DPR Water Conservation Plan outlines park definitions; the information below is an excerpt from that document. Figure 1.3.1 illustrates the relationship between the information.



**Figure 1.3.1 Park Definition, Typology & Habitat**

#### 1.3.1 Park Definitions and Criteria

Within any particular park or open space definition, there are a variety of typologies and habitat types.

Pocket Parks: Pocket parks are small, urban parks that function primarily as neighborhood social areas. They are approximately ½ to 1 ½ acres in size. Pocket parks are primarily passive places with a limited number of small-scale areas for active use (such as playgrounds).

- Provide a park character that may be composed of the Urban/Built Up Traditional Park typology and/or Grassland typology.
- Emphasize pedestrian movement to and within the pocket park.

- Create spaces that are integrated into the fabric of the neighborhood.
- Create definable edges or boundaries.
- Provide a good opportunity for themed or specialized spaces.

Neighborhood Parks: Neighborhood parks are smaller than 10 acres. These parks are close to residents, within walking or biking distance, and fulfill active recreation needs for tennis, playgrounds, informal play fields, multipurpose courts and passive open space. The green, open space is important to the vitality and character of Denver's neighborhoods. These parks can be a focus of neighborhood recreational and social activity. Neighborhood parks are particularly important because they provide easy access being close to users' homes, and provide recreation for children, the elderly, and other less mobile populations.

- Provide a park character that may be a mixture of the Urban/Built Up Traditional Park and Grassland typologies.
- Emphasize pedestrian movement to and within the park.
- Create spaces that relate to the specific needs of the immediate neighborhood.
- Create clearly definable park edges and interior park spaces.

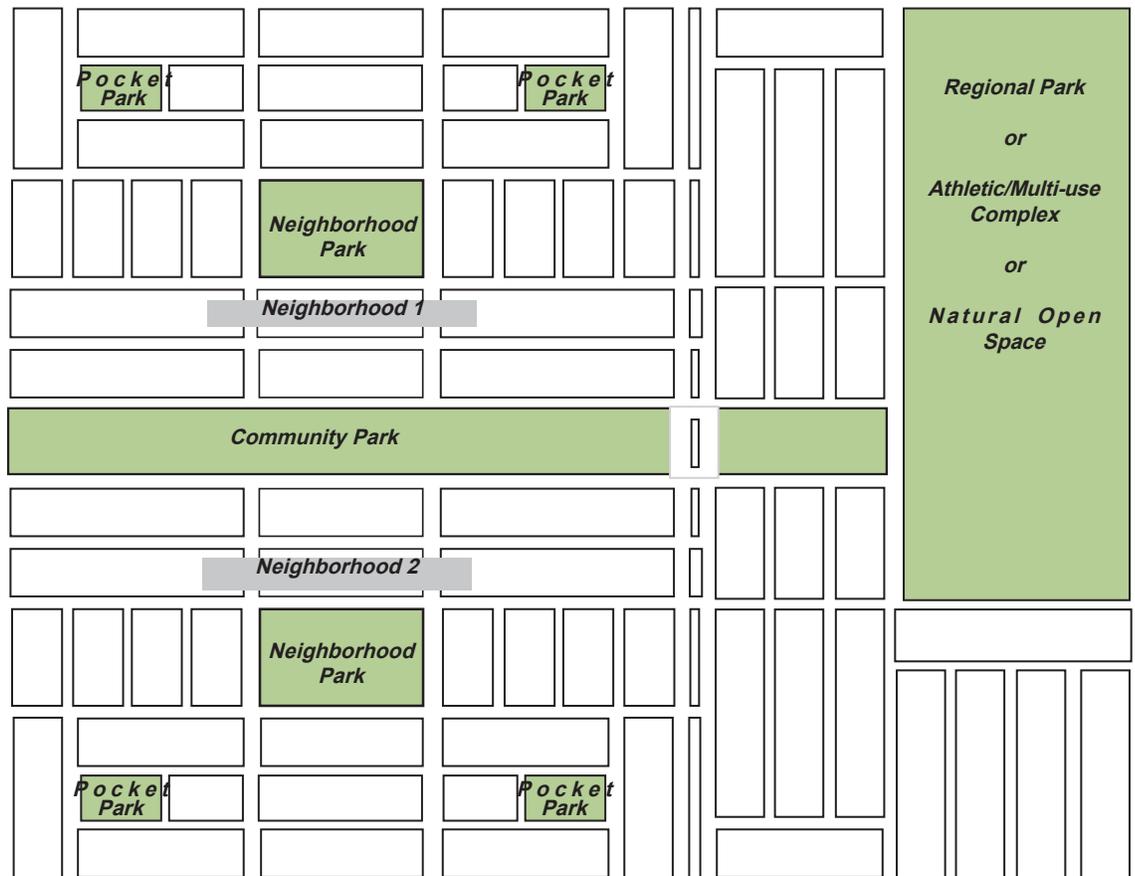
Community Parks: Community parks are places accessible to two or more adjacent neighborhoods. Community parks range in size from 5 to 80 acres and generally provide a larger park with off-street parking, flexible open space for picnicking and passive use, athletic facilities for organized sports, and in some cases, recreation centers. They often have special features including flower beds or viewpoints, which draw residents from surrounding neighborhoods. If the infrastructure is available, community parks may also contain drinking fountains and restrooms.

- Provide a character that will be a mixture of the Urban/Built Up Traditional Park, Forest Land and Grassland typologies.
- Create spaces that enrich the park character while meeting both the passive and active recreation needs of the community.
- Improve on-site/off-site water quality and integrate water quality treatment.

Regional Parks: Regional parks serve the entire community of Denver and the metropolitan area. These parks are all greater than 80 acres and have a major impact on the image of the city. They break the grid system pattern, enhance the environment with visual and physical relief, and reduce noise and pollution. These parks make green, open landscapes accessible to Denver residents. Regional parks provide larger areas for complexes or facilities, large amounts of flexible passive open space, large water bodies, picnic facilities, playgrounds, athletic fields and restrooms. These parks serve all of the metropolitan area residents.

- Provide a park character that may be composed of the Urban/Built Up Traditional Park, Forest Land and Grassland typologies.
- Emphasize pedestrian movement to and within the park.
- Create spaces that are integrated into the fabric of the neighborhood.
- Create definable edges or boundaries.
- Improve on-site water quality and integrate water quality treatment.

Urban Open Space: Urban open space parks are primarily urban downtown



*Park Definitions Illustrated*

parks and open space. They vary in size from small pocket parks to linear parks, streets, or transit malls. They function as formal, urban open spaces, pedestrian in nature, with outdoor uses. Urban open space parks are designed to accommodate pedestrian activities and are focal points of activity. They are associated with public buildings or commercial areas.

**Natural Open Space:** Natural open space is a physical and biological area which either retains, has reestablished, or has the potential to reestablish many aspects of its natural character. These areas are generally larger than five acres and may host geological, scenic or other natural features of scientific or educational value. Natural open space areas provide natural wildlife habitat areas, scenic recreational experiences, trails and related facilities. Natural areas classifications are: active use natural areas, conservation and restoration areas, potential native areas and preservation areas. These areas may be linear riparian and/or trail corridors.

- Create or preserve a prairie ecosystem that reflects the native conditions, including landforms, soils and vegetation.
- Integrate elements, structures, water quality areas and flood control improvements into the park character.
- Create a broad range of wildlife habitats.

**Mountain Parks:** Mountain parks are characterized by elevations above 6,000

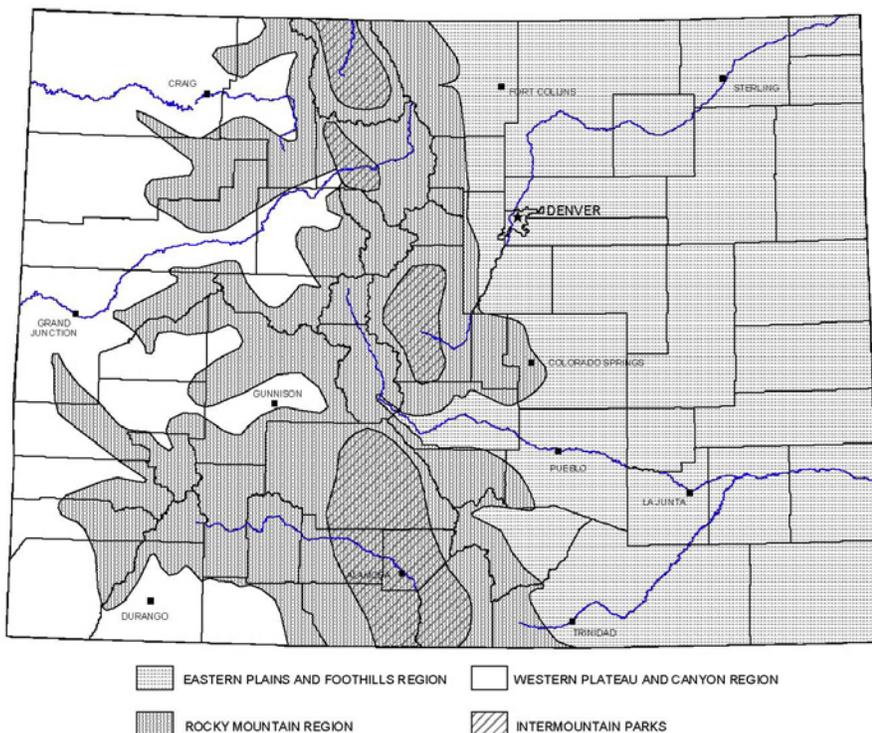
feet and by deep, narrow canyons, steep slopes and gently sloping divides. The natural landscape provides recreational amenities with passive activities such as scenic viewing, hiking, picnicking, camping, and fishing.

**Athletic/Multi-Use Complexes:** Athletic/Multi-Use complexes are highly intensive recreational facilities. They include state-of-the-art facilities for field sports and can accommodate large tournaments. The complexes are generally linked to the parks and open space system through trail connections to other facilities. Additionally, the athletic/multi-use complexes offer amenities such as concessions and restrooms and can accommodate informal recreation including court games, children’s play areas for all ages, and indoor meeting space.

- Design and locate the athletic/multi-use complexes to be compatible with adjacent land uses and adjacent parks and open spaces.
- Encourage multi-modal access. Parking areas are typically larger in these parks to accommodate tournaments.
- Create park elements, structures and water quality treatment areas that are compatible with the parks and open space system.

### 1.3.2 Floristic Regions, Life Zones and Typologies & Habitat

As stated earlier, Denver parks capture the essence of Colorado, from sand-hill prairie along First Creek in far northeast Denver to fragile tundra at the peak of Mt. Evans. They span nearly 100 miles, 8,700 feet in elevation change, and five ecosystems. The following information is excerpted from the *Native Plant Revegetation Guide for Colorado* (p.11-12) and is provides an overview of the natural landscape patterns within Denver parks.



The state is divided into three floristic regions based on geography, elevation and climate. The Eastern Plains and Foothills Region occurs on the eastern side

of the state below 8,000 feet (2,438 m). The Rocky Mountain Region occurs in the center of the state on either side of the Continental Divide and includes the intermontane valleys (North Park, Middle Park, South Park and the San Luis Valley). The Western Plateau and Canyon Region occurs on the western side of the state below 8,000 feet (2,438 m).

Table 1.3.2.1 Lifezones		
Alpine	11,400'	>
Subalpine	9,300'	11,400'
Montane	7,500'	9,300'
Foothills	6,000'	7,500'
Plains	<	6,000

Within each floristic region, the natural landscape can be subdivided into life zones, each zone being characterized by a given range of temperature, humidity, type and amount of precipitation, growing season length, amount and distribution of wind and soil conditions (Merriam 1899, Marr 1967). Five life zones defined by elevation occur in Colorado: alpine, subalpine, montane, foothills, and plains. Divisions between zones are not always distinct; zones are often separated by transition areas (ecotones) between two or more distinct zones. The elevational limits are general descriptions and may vary with topography, aspect, and latitude. For instance, because of differences in amounts of solar radiation which affect factors such as temperature, precipitation, and growing season, life zone boundaries tend to occur at higher elevations as you travel south. Life zones also tend to be higher on south-facing slopes than on adjacent north-facing slopes at the same latitude. Each floristic region contains at least one life zone, and each life zone generally includes several natural communities. A few natural communities (wetland and riparian communities in particular) may cross life zones.

Natural communities tend to occur in predictable patterns on the landscape. The distribution of flora and fauna is for the most part determined by local resources and conditions. Important factors include water and nutrient availability, temperature, light, disturbance, and the presence of other organisms.

Table 1.3.2.2 summarizes the various vegetation types, or communities, that can be found within Colorado. The data set was established by The Colorado Vegetation Classification Project (CVCP), a cooperative interagency with Colorado Division of Wildlife, Bureau of Land Management, and US Forest Service and has been modified by and for DPR Parks needs. Land cover types are listed in hierarchical form based on the classification system devised by Anderson, et al. (1976); titled A Land Use and Land Cover Classification System for Use with Remote Sensor Data. Each level reveals further detailed information within the overall Type I classification. See Appendix B for Land Cover: Type III information. Although other documents exist that classify habitats for Colorado, the following is intended to give a larger overview of the entire scale of habitats within the Denver park system.

Table 1.3.2.2

Edited by DPR. Information based on The Colorado Vegetation Classification Project (Colorado Division of Wildlife (CDOW), Bureau of Land Management (BLM), and U.S.Forest Service (USFS))

<p><b>TYOLOGY</b> Land Cover: Type I</p>	<p><b>HABITAT</b> Land Cover: Type II</p>
<p>1 URBAN/BUILT UP: High density commercial or high density residential areas.</p>	<p>10 PARK: Traditional park landscape including irrigated turf and relatively formal landscape, including trees and shrubs. May also include golf courses. 11 RESIDENTIAL: High density residential areas, consisting of homes, lawns, and planted trees. 12 COMMERCIAL: High density urban areas with little vegetation, parking lots, buildings, etc.</p>
<p>2 AGRICULTURE: Row crops, irrigated pasture and hay fields, dry farm crops.</p>	<p>21 DRYLAND AGRICULTURE: Dryland crops and fields. 22 IRRIGATED AGRICULTURE: Irrigated crops and fields. 23 ORCHARD: Agricultural areas consisting of orchards.</p>
<p>3 GRASSLAND (RANGELAND): Consists of grass/forb range, shrub/brush range, or mixed range.</p>	<p>31 GRASS/FORB PRAIRIE: Perennial and annual grasslands. Low elevation (&lt; 6,000') species include blue grama, needle &amp; thread, sand drop seed, prairie clovers, gay feathers and cone flowers. Mid elevation (&gt; 6000' and &lt; 9500') species include blue grama, junegrass, western wheat, pussy toes, golden banner and paintbrush. In the southeast plains region of Colorado, grasslands are often associated with yucca and various cacti species, such as cholla, and prickly pear. 32 SHRUBLAND: Consists primarily of sagebrush, saltbrush, greasewood, snakeweed, mountain mahogany, paintbrush, evening primrose and penstemon. 33 SHRUB/GRASS/FORB MIX: Mixed grass/forb and shrub/grass. Example species include a combination of the above.</p>
<p>4 WOODLAND: Consists primarily of pinyon/juniper, oak or pinyon/juniper/oak mixed.</p>	<p>41 CONIFEROUS WOODLAND: Woodlands of pinyon/juniper . 42 DECIDUOUS WOODLAND: Woodlands of gambel oak and mountain shrub mix. Example species include mountain mahogany, chokecherry, sumac, and currants. 43 MIXED WOODLAND: Woodlands of pinyon/juniper/gambel oak or pinyon/juniper mix or pinyon/juniper mountain shrub mix. Example species include artemisia, rabbitbrush, yucca.</p>
<p>5 FOREST LAND: More than 25% forested land (deciduous, coniferous, and mixed forests).</p>	<p>51 DECIDUOUS FOREST LAND: Forests of aspen or aspen/oak mix. 52 CONIFEROUS FOREST LAND: Forests consisting of one or more evergreen tree species. Example species include ponderosa pine, douglas fir and spruce/fir mix. 53 MIXED FOREST LAND: Forests consisting of a mixture of coniferous and deciduous trees or tall shrub species. Example mixes include: pine/oak, fir/aspen, pine/aspen mix, bearberry, or common juniper.</p>
<p>6 BARREN LAND: Less than 10% vegetation.</p>	<p>61 ROCK: Less than 10% vegetation, rock outcrops, red sandstones, etc. 62 SOIL: Less than 10% vegetation, dominated by bare soil.</p>
<p>7 SUBALPINE/ TUNDRA: Areas both above and below timberline consisting of alpine tundra and subalpine grass/forb meadow species.</p>	<p>71 ALPINE MEADOW: High elevation areas above treeline (&gt; 11,000 ') where alpine tundra vegetation includes grasses, forbs, and sedges. Principal species may include alpine timothy, alpine bluegrass, tufted hairgrass, spike trisetum, alpine sagebrush, yarrow, alpine avens, american bistort, sticky polemonium, wild strawberry, and/or sedge species. 72 SUBALPINE SHRUB COMMUNITY: Upper montane elevation (7,000-11,500 ft) shrubs consisting primarily of shrubby cinquefoil, mountain gooseberry, birch, willow and with subalpine meadow species in the understory. 73 SNOW: Perennial snow fields. 74 SUBALPINE MEADOW: Below timberline, high elevation (approx 9,000-11,500') herbaceous vegetation.</p>
<p>8 RIPARIAN: Riparian areas along waterways or standing wetlands. (Principal woody species include Narrowleaf and Common Cottonwood, Maple, Birch, and various willow species. Herbaceous species include various sedges, Scouring Rush, and cattails.)</p>	<p>81 FORESTED RIPARIAN: Wooded riparian areas consisting primarily of poplars. 82 SHRUB RIPARIAN: Shrub riparian areas consisting primarily of shrubs. Example species include: willows, red-osier dogwood, three leaf sumac, wood's rose, bog birch, water birch, or currant. 83 HERBACEOUS RIPARIAN: Non-woody riparian areas consisting primarily of sedges.</p>
<p>9 WATER: Open water such as lakes, streams, and rivers.</p>	<p>91 STANDING WATER: Consists of lakes and reservoirs. 92 RUNNING WATER: Consists of rivers and streams.</p>

---

## 1.4 Process To Update DPR Standards

---

The Standards document is considered to be a dynamic process that will be continually shaped through dialogue and demand. It documents the practices of the Department currently, and as practices change, so too should the Standards document. The Standards document is the responsibility of the DPR Planning Division. An annual review of employee input and analysis of the Standards Variance forms (See Section 2.6) will provide updated information to consider for changes in the Standards.

Proposed changes to the Standards shall be submitted to the Director of Planning for approval. It is the responsibility of the Director of Planning that any changes be reviewed and approved by other Division Directors. The Standards document will be revised to reflect the updated information and be distributed in the fourth quarter in order to prepare the document for the new CIP year.

## 1.5 Sustainable Mission

---

Denver Parks and Recreation Department is dedicated to being a leader in implementing progressive, sustainable planning, design and construction methods in everything it does. Our mission, like that of the City's Greenprint Denver initiative, is to provide leadership and solutions to ensure a prosperous community where people and nature thrive.

### Sustainable Design for Denver Parks

Sustainable design is defined as the art of designing physical objects, the built environment, and services to comply with the principles of economic, social, and ecological sustainability. The essential aim of sustainable design is to produce places, products and services in a way that reduces use of non-renewable resources, minimizes environmental impact, and connects people with the natural environment.

The Department will seek the following guiding principles and objectives in the planning, design, and construction of all projects:

### Guiding Principles

- Communicate sustainability as a public value and expand the concept of the Parks and Recreation Department as a steward of public resources.
- Support sustainability as a core business value to improve efficiencies in resource use and reduce environmental impact.
- Utilize long range analyses in our decision making, seeking to balance economic, social and environmental considerations into all park planning and development projects.
- Pursue activities that support environmental equity and health for both citizens and urban wildlife.
- Lead by example wherever possible. Sustainable Objectives
- Utilize low-impact materials: choose non-toxic, sustainably-produced or recycled materials which require little energy to process.

- 
- Focus on energy efficiency: use manufacturing processes and construct products that require less energy.
  - Select materials for their quality and durability: longer-lasting and better-functioning products will have to be replaced less frequently, reducing the impacts of producing replacements.
  - Plan for and design for reuse and recycling of new and demolished materials.
  - Buy local whenever possible: materials should come from nearby (local or bioregional), sustainably-managed renewable sources.
  - Develop healthy buildings: sustainable building design aims to create buildings that are not harmful to their occupants nor to the larger environment. An important emphasis is on indoor environmental quality, especially indoor air quality.

The principles and objectives outlined above should be reflected in each and every aspect of this document. While not explicitly called out in each section of this document, they should be incorporated into every project. For example, if a section of new trail is being designed, while the document may recommend a certain width and thickness of trail depending on its intended use, the designer should be cognizant to incorporate as much fly-ash content as practical and to specify that the concrete be transported from as nearby a location as possible, among many other sustainability-oriented considerations.

With one of the largest park systems in the country, DPR recognizes the importance of continuing to grow its leadership role in sustainable practices through the “green” development, design and construction of Parks projects. Reducing the use of increasingly scarce resources like water and energy will help the Denver model sustainable growth while reducing operational costs.

## 2. Projects: Planning, Design & Construction

Definitions:
Planning: An activity that involves the study of DPR land/facilities in a long-range context, for the purpose of developing consensus and understanding of the issues for eventual design and implementation.
Design: An activity that involves preparation of plans and specifications for construction or eventual construction.
Construction: An activity that involves implementation of a design.
Project: An activity involving planning, design, or construction.
Project Management: An activity that involves oversight of a planning, design and/or construction project.
Planner: The individual who is responsible for managing DPR projects, generally within an assigned district.

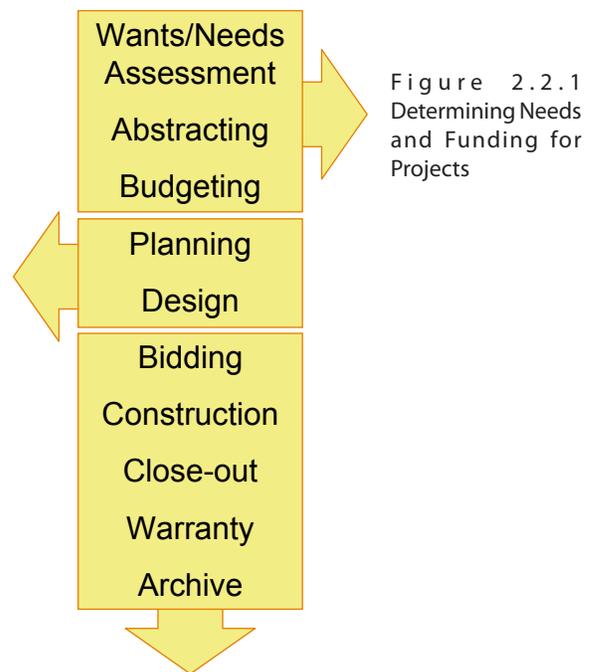
Park projects range in size and scope, and procedures, submittals and approval processes vary relative to the type of project and the phase of work being completed. The following outlines prototypical processes, submittals and approvals for DPR projects. The City Project Manager shall confirm the appropriate project process, submittals and approvals prior to initiating the project.

### 2.1 Project Management

Figure 2.1.1 illustrates the phases involved in a project from beginning to completion. Where a project starts within these phases may be determined by previous plans and analyses so that a project may not always be continuous from beginning to completion.

- Figure 2.3.1 Initiating a Project
- Figure 2.3.2 How a Project is Planned
- Figure 2.3.3 How a Project is Designed
- Figure 2.6.1-4 Document Requirements
- Figure 2.5.1 Internal Design Review
- Figure 2.5.2 Public Meeting Process
- Table 2.4.3 Who's Gonna Do What
- Table 2.4.4 DPR Standards Checklist

#### ASPEN 10 Project Phases



- Figure 2.4.1 How a Project is Built
- Figure 2.6.1-4 Document Requirements
- Figure 2.5.1 Internal Design Review
- Table 2.4.2 Built Design
- Table 2.4.3 Who's Gonna Do What
- Table 2.4.4 DPR Standards Checklist

**Figure 2.1.1 10 Project Phases**

---

## 2.2 Phases 1-3: Determining Needs and Funding

---

Many factors affect how projects are scheduled and funded. Figure 2.21, Determining Needs & Funding for Projects, shows the typical yearly process that determines priorities for the Parks and Recreation Planning Division.

---

## 2.3 Phases 4-5: Planning & Design

---

Planning and design varies depending on the type and size of a project. Figure 2.3.1, Initiating a Project: Writing a Scope & Selecting a Consultant, illustrates the steps that are taken when initiating a project, Figure 2.3.2, How a Project is Planned: Planning Process, is a prototypical approach for a DPR project; and Figure 2.3.3, How a Project is Designed: Design Development and Construction Document, is a prototypical approach for developing a plan into construction documents from which a project can be built. Each of these should serve as guides, and each project will typically require customizing of scope and process to serve the unique needs of the project.

---

## 2.4 Phases 6-10: How a Project is Built

---

Construction can be complicated and unpredictable due to a variety of unforeseen conditions and factors. Figure 2.4.1, How a Project is Built, outlines the typical procedures for construction projects.

---

## 2.5 Project Review

---

In order to ensure that a project complies with all City codes, plans and department-wide expectations, a project typically goes through an internal review. Figure 2.5.1, Internal Design Review Process, provides a guideline for a project. The DPR Standards Checklist, Table 2.4.3, also provides a tool by which to evaluate a project, and implement, the DPR Standards.

In addition to an internal review, projects will often go through a public review process as well. Figure 2.5.2, Public Meeting Process, identifies when a project should be taken through this process and serves as a basic checklist for setting up a public meeting.

---

## 2.6 Product Expectations

---

Figure 2.6.1, 2.6.2, 2.6.3, and 2.6.4 relate the document requirements for final products that will be turned over to DPR.

---

## 2.7 Applying for a DPR Standard Variance

---

DPR Standards should be exercised in the presence of sound judgment. The standards do not preclude the use of different methods when special conditions or site-specific conditions are a factor and when proper authorization is obtained. If a major deviation from the Standards is necessary or desirable, the Project Manager shall complete a DPR Standard Variance Form (See Appendix C) so that a change can be evaluated by Division Directors and analyzed as a possible future revision to the DPR Standards.

---

## 2.8 As-Built and AutoCAD Requirements

---

As-Built Drawings shall be in accordance with the City and County of Denver's General Contract Conditions 323, 402, and 403 - 1999 Edition, also known as the "Orange Book" and as noted in these Planning, Design and Construction Standards.

### 2.8.1 Submittal Process:

The General Contractor shall submit a complete Half-Size set of As-Built Drawings to the Parks and Recreation Project Manager for review at time of Project Final Acceptance. The Parks and Recreation Project Manager shall review the As-Built Drawings in a timely manner and return corrected/redlined copies to the General Contractor no later than fifteen (15) business days after receiving the drawings.

The redlines shall be corrected by the General Contractor and submitted back to the Parks and Recreation Project Manager not later than fifteen (15) business days of receiving. As-Built Drawings shall be submitted in Accordance with 2.8.2 Requirements as outlined below.

### 2.8.2 Requirements:

Final As-Built Plans shall be submitted no later than thirty (30) days after Final Acceptance of the Project and shall include the following:

1. All As-Built Drawings shall be submitted in digital format in both of the following:
  - a. AutoCAD® (version 2007 or later)
    - i. AutoCAD file shall be purged of all non-essential layers and include only those layers relative to the construction of the project, including utilities.
  - b. Adobe PDF® (version 7.0 or later)
2. As-Built Drawings may be submitted, either electronically via the Parks and Recreation FTP site (see \*\*\* for FTP instructions) or on a CD/DVD disk or jump drive. Electronic files may be submitted in a compressed or zipped format.
3. All electronic As-Built Drawings shall contain both a standard full size submittal and half-size submittal as follows:
  - a. Full size – 24 x 36 (Arch D)
  - b. Half-size – 12 x 18 (Arch B)

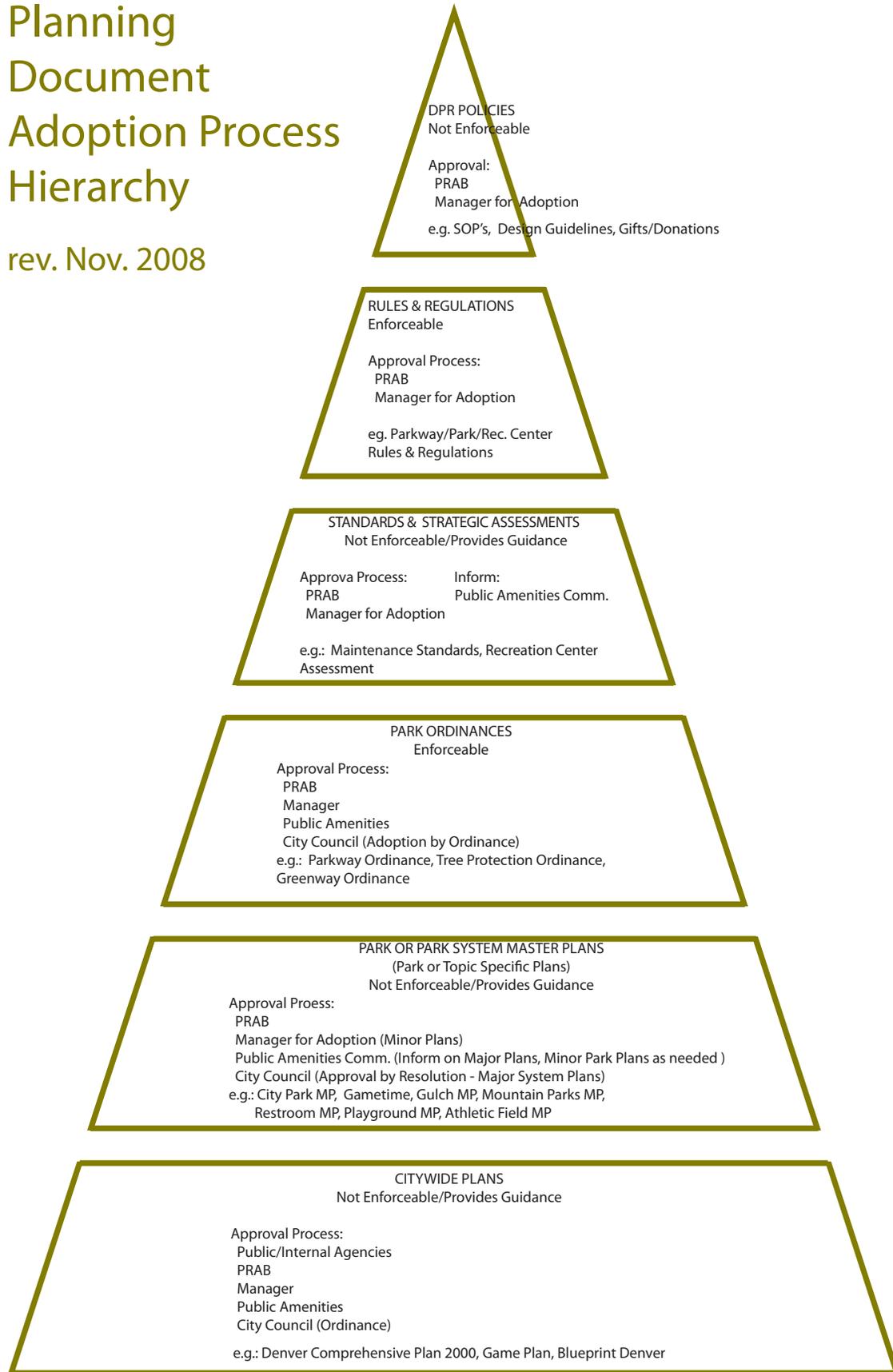
Incomplete submittals will not be accepted. Final payment will not be granted until Final As-Built Drawings are approved by the Project manager and, when required, logged in and approved by the Building Department.

## 2.9 Adoption Process Hierarchy

---

# Planning Document Adoption Process Hierarchy

rev. Nov. 2008



**Figure 2.9 Adoption Process Hierarchy**

# Determining Needs & Funding for Projects.

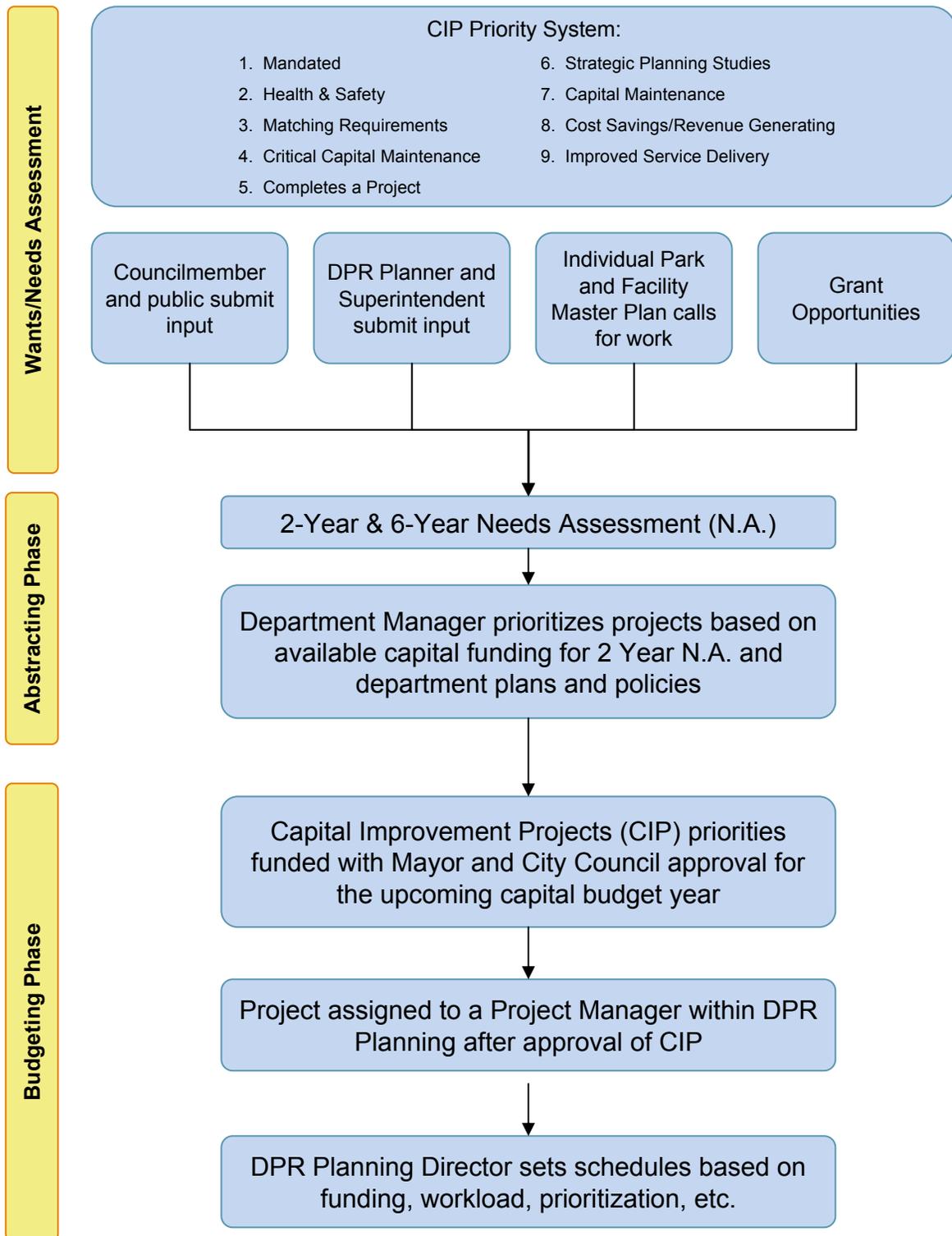


Figure 2.3.2 How a Project is Planned: Planning Process

# Initiating a Project

## Writing a Scope & Selecting a Consultant

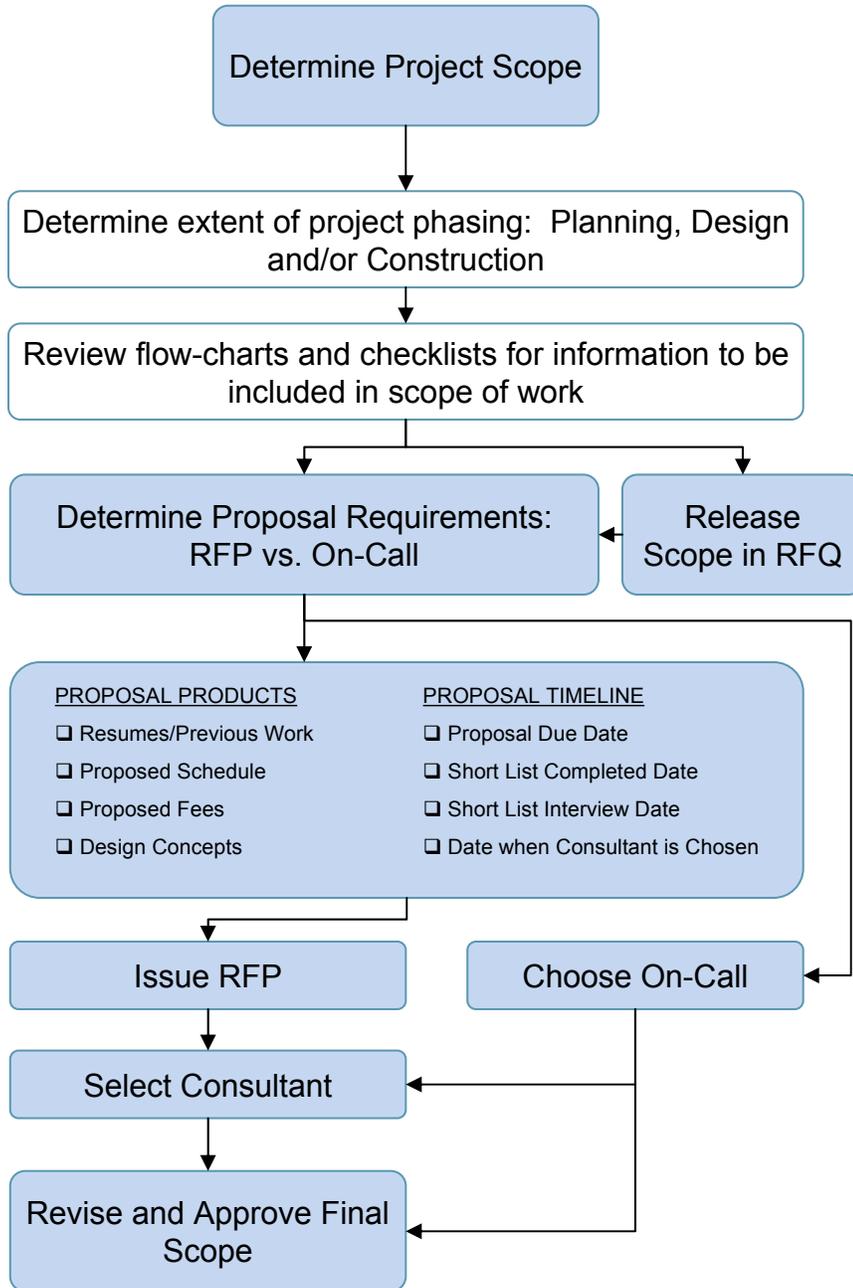


Figure 2.2.1 Determining Needs & Funding for Projects

# How a Project is Planned.

## Planning Process

Prototypical for a DPR project, may be adjusted based on project size and type.

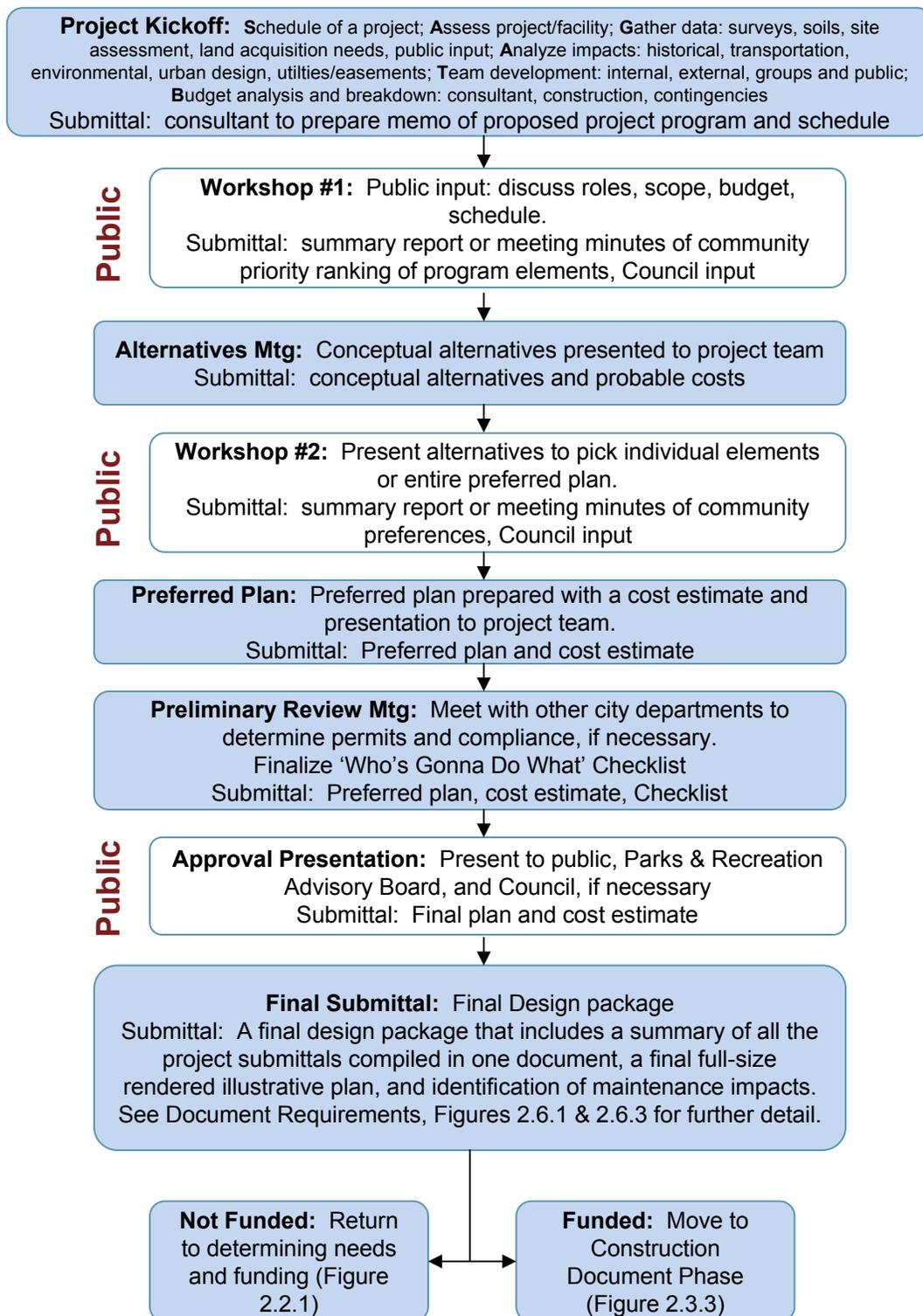


Figure 2.3.1 Initiating a Project: Writing a Scope & Selecting a Consultant

# How a Project is Designed.

## Design Development (DD) & Construction Documents (CD)

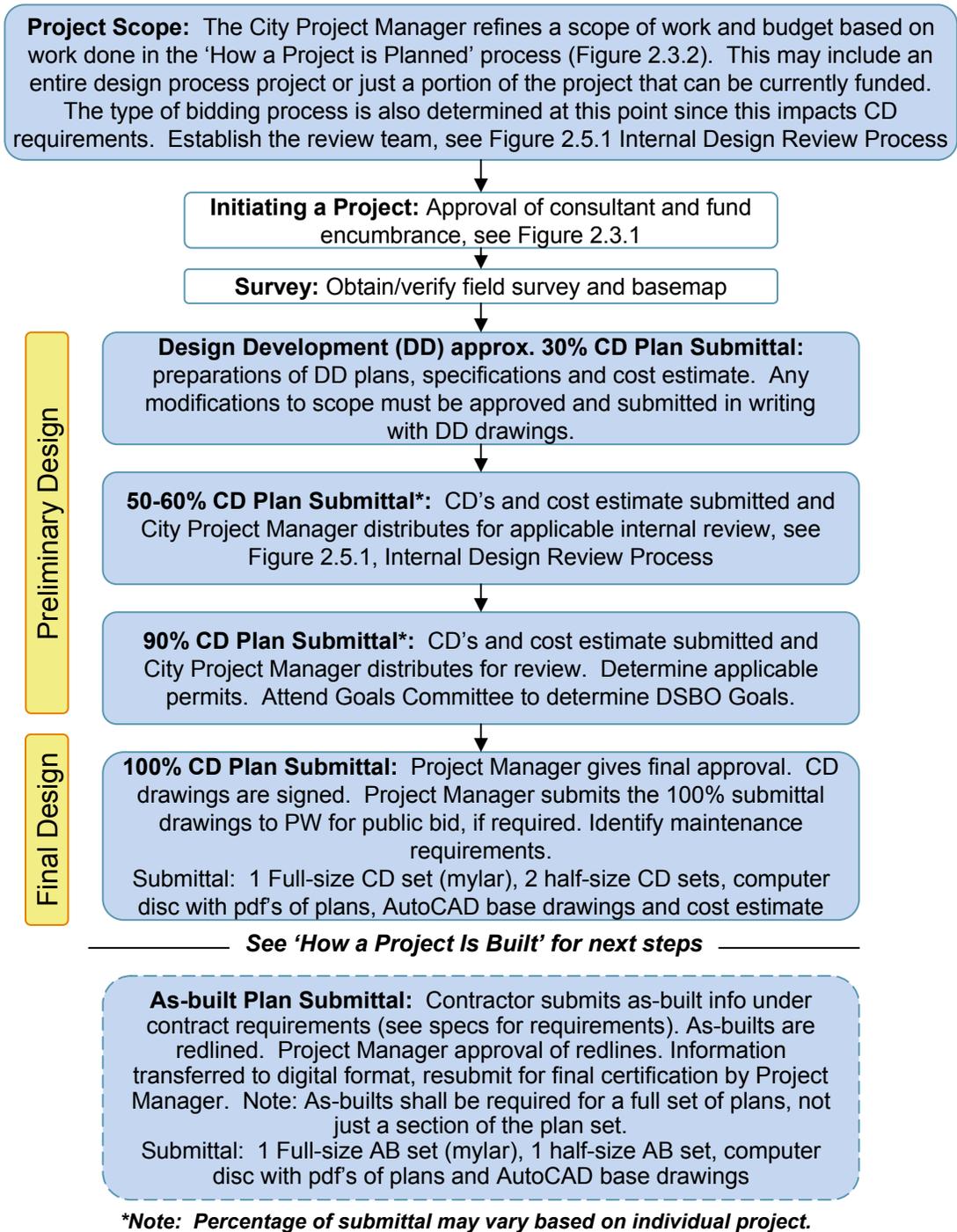


Figure 2.3.3 How a Project is Designed: Design Development & Construction Document

# How a Project is Built.

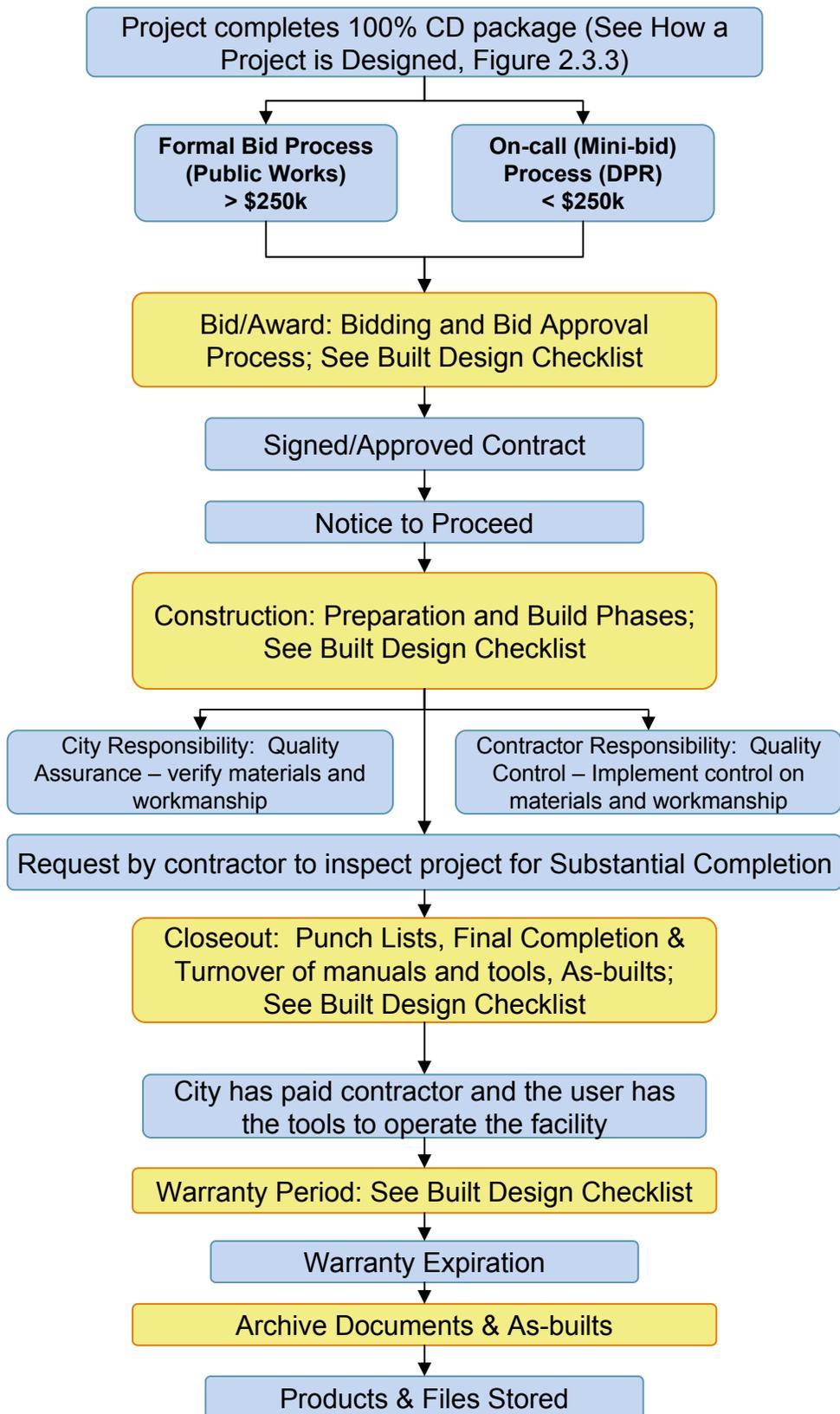


Figure 2.4.1 How a Project is Built

# Internal Design Review Process

- This information provides a guideline for a project. The Project Manager should customize this list to fit the needs of a specific project.

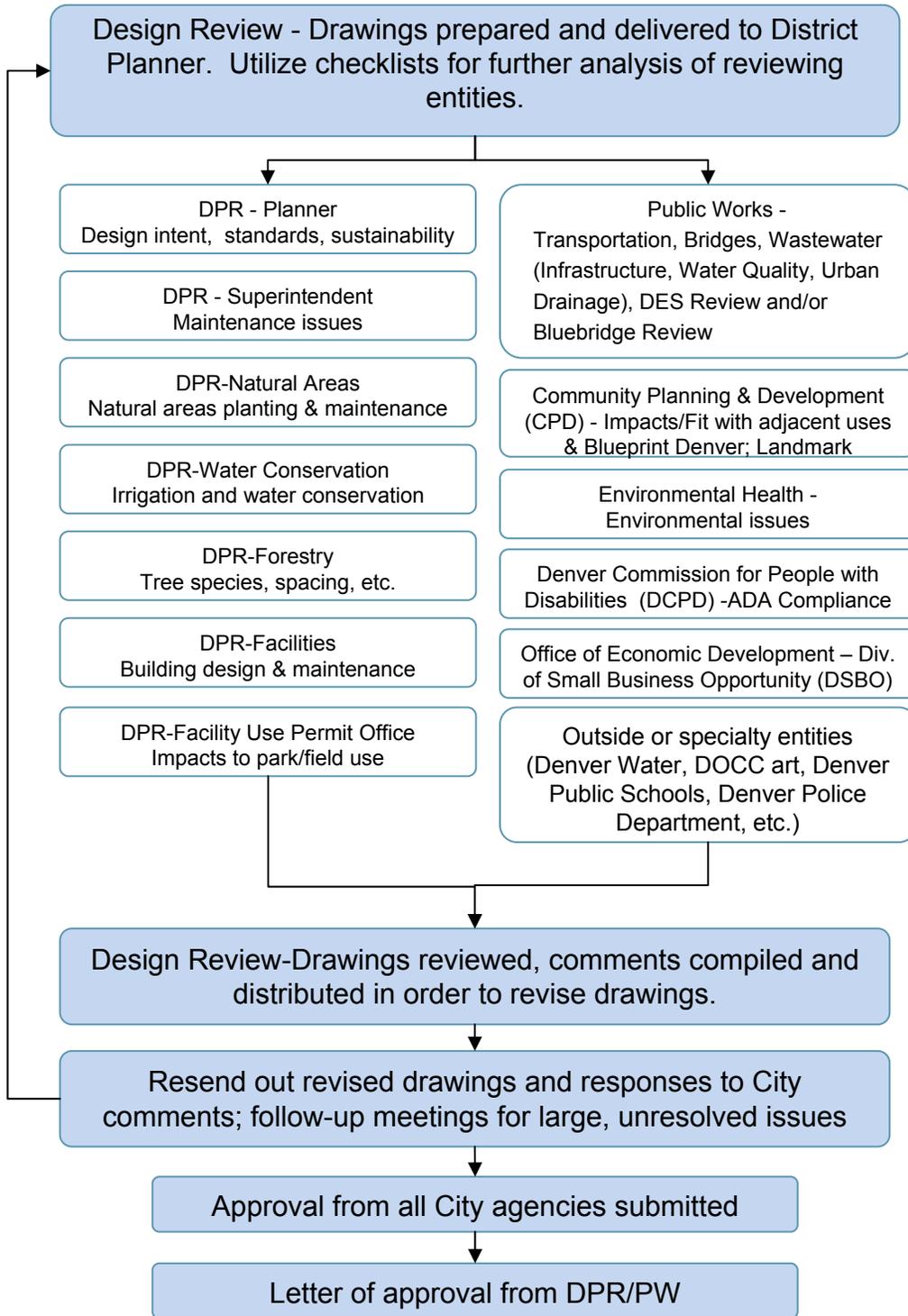


Figure 2.5.1 Internal Design Review Process

# Public Meeting Process

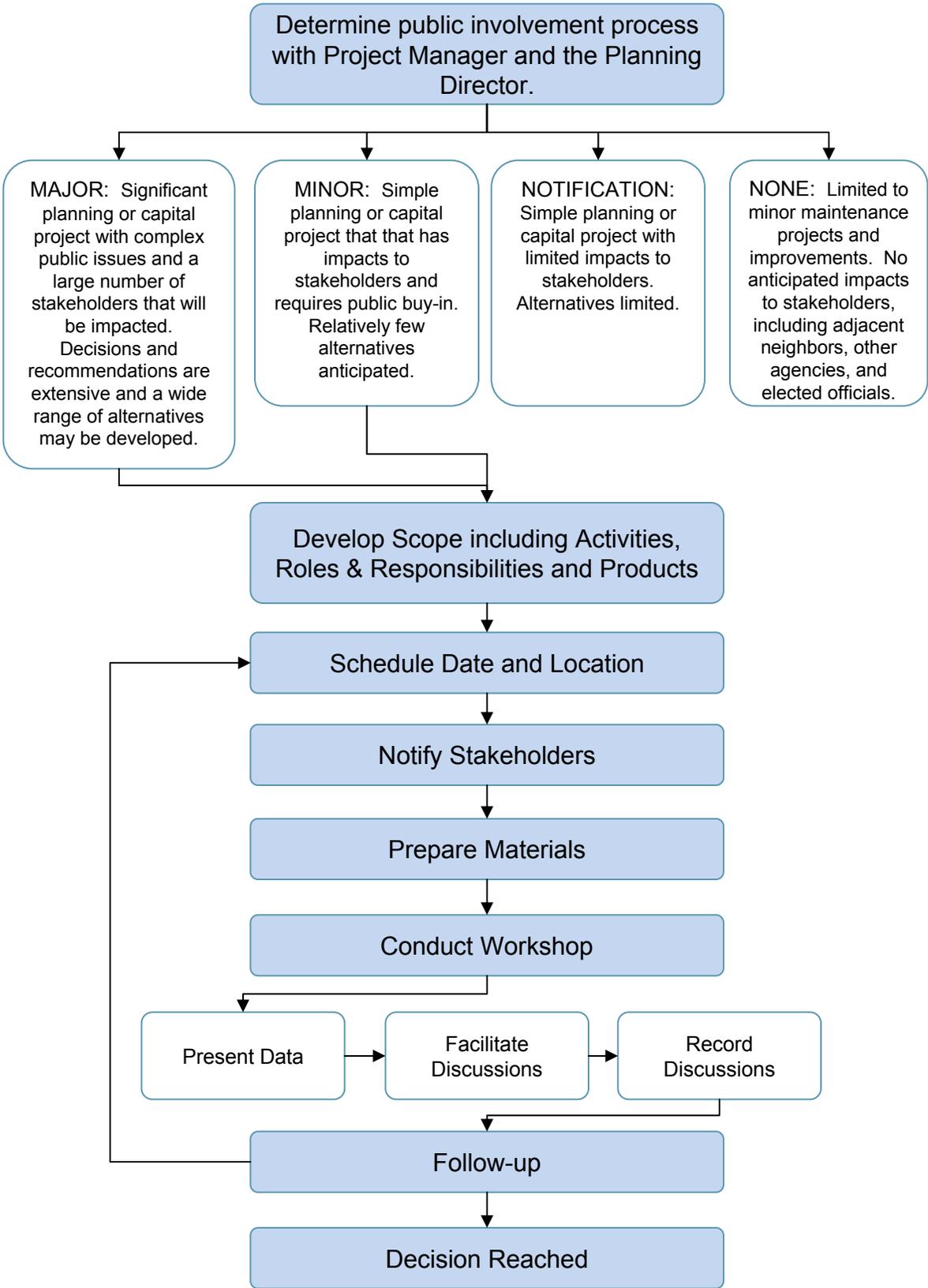


Figure 2.5.2 Public Meeting Process

# Document Requirements

## Planning/Design Process

- Conceptual designs and/or master plan for a design
- Used for presentations to supervisors, managers, Council, neighborhood boards, etc., and used as exhibits on which construction plans will be based

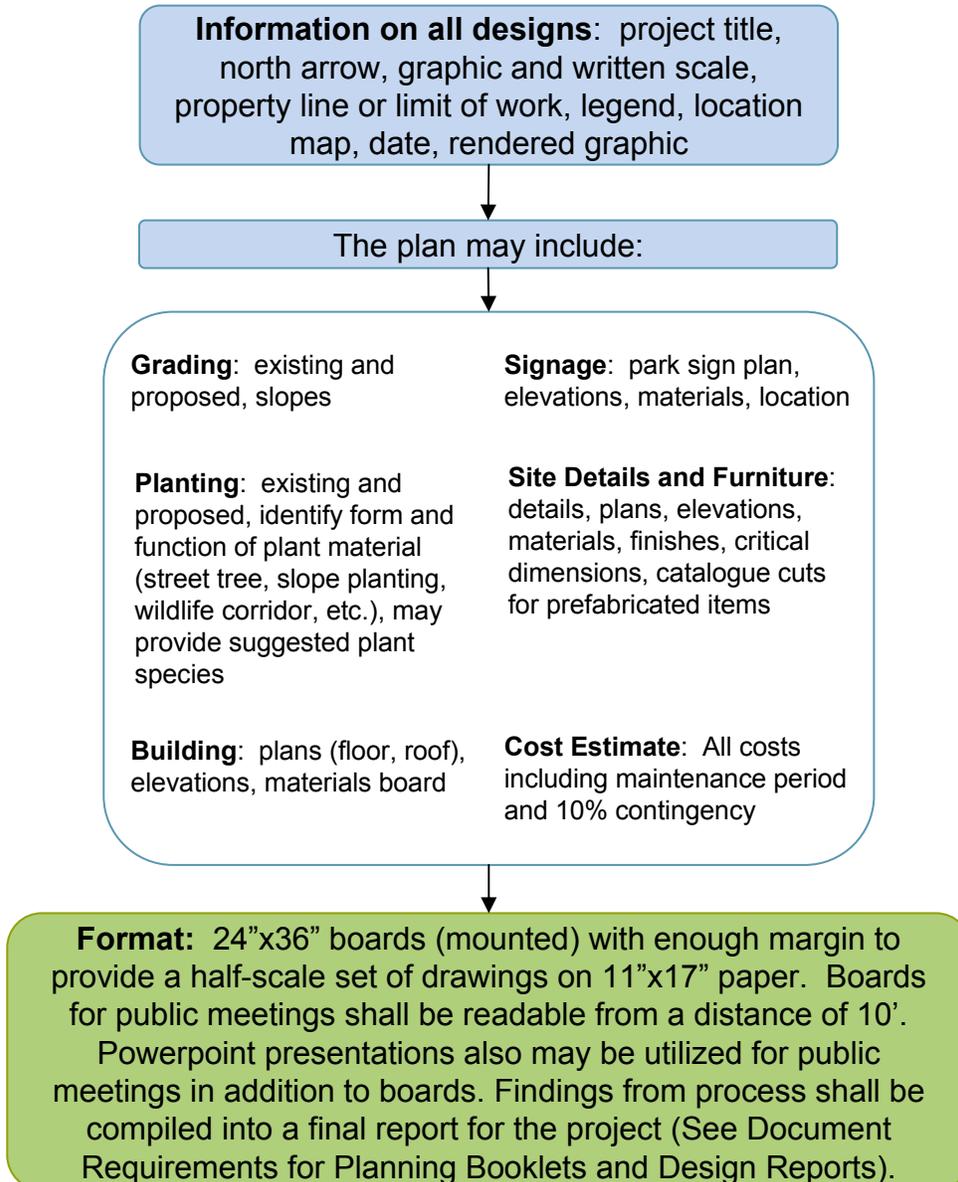


Figure 2.6.1 Document Requirements: Planning/Design Process

# Document Requirements

## Construction Documents (CD's)

- Technical plans used for obtaining bids, the execution and completion of the work and the as-built plans
- Submit to DPR for final signatures

**Basic information for CD's:** 24x36 reproducible bond, lettering no smaller than 1/8", Title block (project name, phase, date, DPR project tracking number), north arrow, graphic and written scale, limit of work, legend, key map, matchlines, labeled streets

**Title sheet:** Project name, vicinity map, project address, DPR project tracking number, project contacts, sheet index, survey data, any DPR required notes

May also contain:

**Grading/Drainage:** existing and proposed, spot elevations, slope gradients, off-site grading, limit of grading, details, legend, notes, specifications

**Irrigation:** components, drinking fountains, water service/meter coordinates, water budget/schedule, details, legend, notes, specifications

**Layout:** existing and proposed improvements, horizontal control, utilities, details, legend, notes, specifications

**Planting:** symbols, schedule, seed mix information, fertilization, details, legend, notes, specifications

**Architectural:** floor/roof plans, elevations, foundation, framing, mechanical, structural, plumbing, electrical, details, legend, notes, specifications

**Electrical:** lights, point of connection, fixture legend and schedule, panel schedule, illumination levels, details, legend, notes, specifications

**Format:** 24"x36" sheets with enough margin to provide a half-scale set of drawings on 11"x17" paper.

**Copies:** Copies vary based on number of submittals and number of reviewing agencies.

See As-Built requirement in How a Project is Designed CD

Figure 2.6.2 Document Requirements: Construction Documents

# Document Requirements

## Planning Booklets & Design Reports

- Conceptual designs and/or master plan for a design
- Used for presentations to supervisors, managers, council, neighborhood boards, etc., and used as exhibits on which construction plans will be based

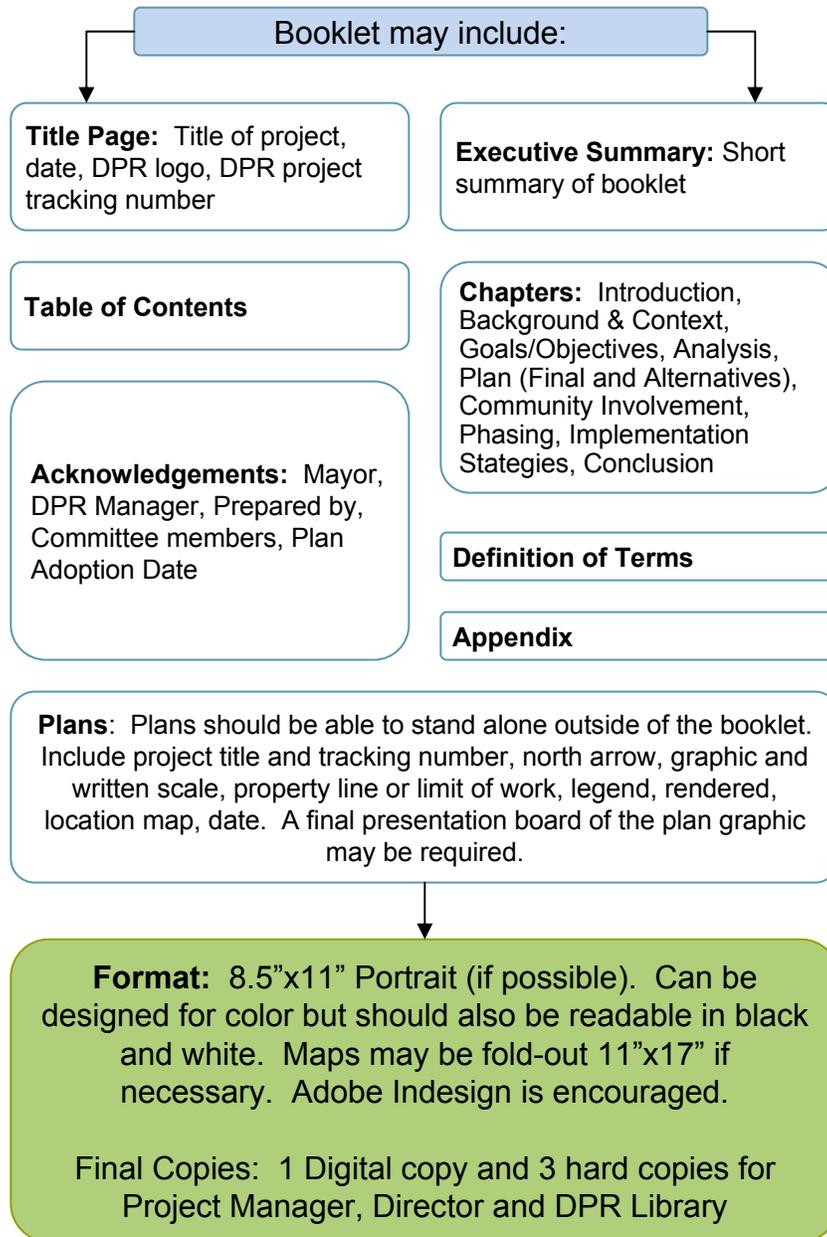


Figure 2.6.3 Document Requirements: Planning Booklets & Design Reports

# Document Requirements

## Operations & Maintenance Manual

- The O&M Manual contains instructions for handling, installation, operation, and maintenance.

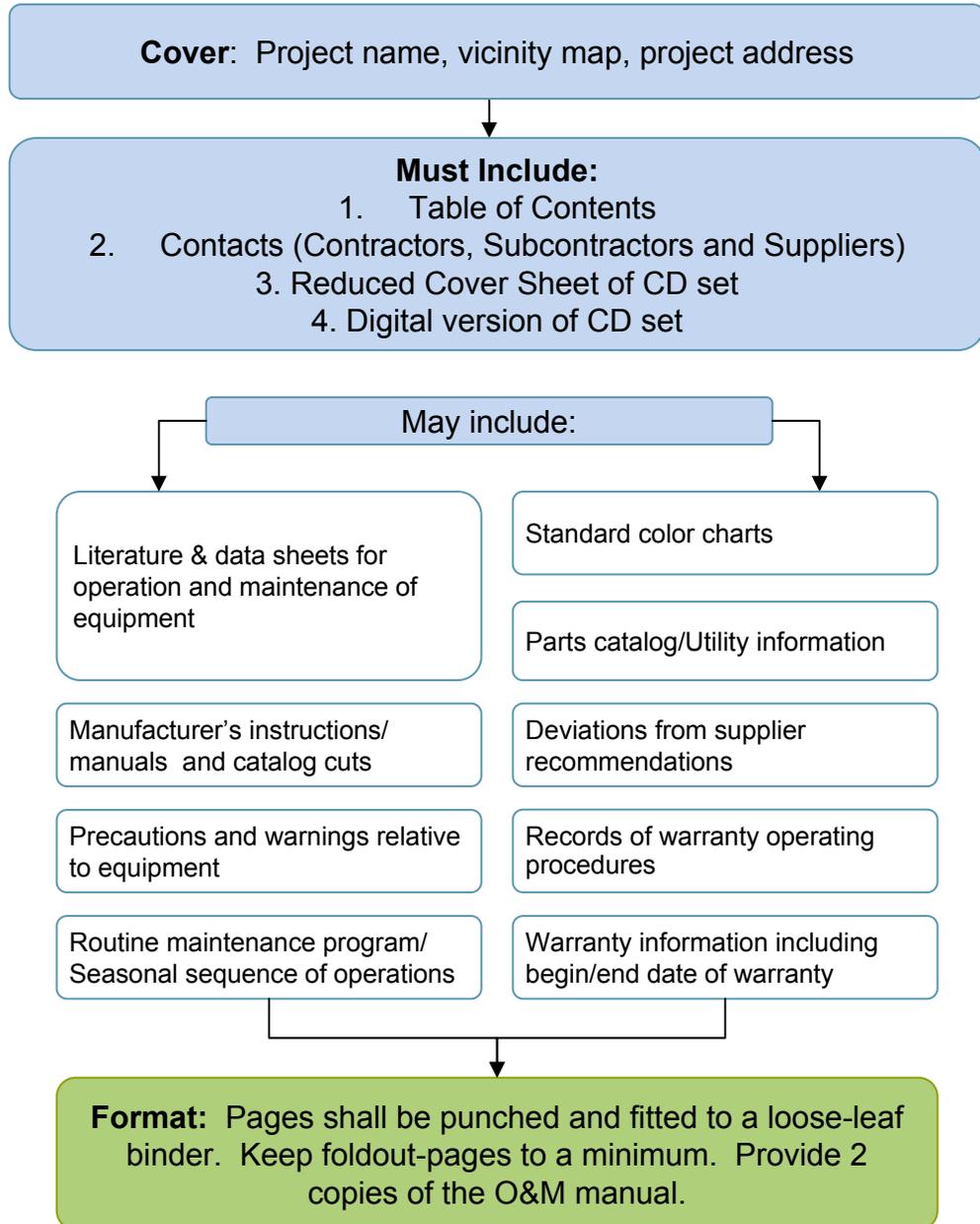


Figure 2.6.4 Document Requirements: Operations & Maintenance Manual

Table 2.4.2 Built Design Checklist	
<b>Bid/Award</b>	
	Advertise (RFP/RFQ/BID)
	Pre-bid meeting
	Addenda/ comments to bid package
	Bid opening
	Review bids
	Check against budget
	Choose alternatives
	Approve or reject
<b>Bid Approval Process</b>	
	Prepare engineer's recommendation
	Obtain DSBO recommendation
	Provide contractors with Notice to Apparent Low Bidder
	Prepare conforming copies of contract (4-7)
	Contractor signs and adds insurance and bonds
	PW prepares Form 42 (Contract Justification) and TC 70 (Encumbers funds) with appropriate fund/org(s)
	Contractor returns signed contract
	Client agency (agency providing funds) signs contract and forms, then regulatory agency
	City attorney reviews signed document
	City Council approval if contract is over \$500,000
<b>Construction - Preparation</b>	
	Pre-Preconstruction Meeting with MOCC for goals and Auditor's office for prevailing wage
	Pre-construction Meeting or Partnering Meeting: invite contractor, user agency, utilities, designer, impacted parties, Project Manager from PW
	Settle on NTP
	Identify sources of power
	Set up weekly meeting schedule
	Set up schedule of values
	Set work schedule; get tax-exempt certificate
	Identify who can sign pay orders and estimates and distribute forms
	Identify who's in charge (both Contractor and City)
	Send letter requesting approval of subcontractors
	Discuss general project sequencing
	Identify project issues ("rock in the road")
	Give Notice to Proceed with established start and complete dates

<b>Construction - Build</b>	
	Submittal review and approval
	Shopdrawing review and approval
	Inspection
	Pull building permit and other permits (Contractor)
	Answer requests for information (City)
	Process Progress Payments (verify quantities and pay contractor)
	Monitor Schedule
	Respond to public inquiries and implement any public coordination
	Process change orders
	Issue field orders
	Participate in regularly scheduled meetings
<b>Closeout</b>	
	Develop punch list and time limit to get done
	Complete preparation of as-built drawings and documentation
	Provide any training and O&M (Operations & Maintenance) manuals
	Supply all required tools
	Be sure punch list is completed
	Prepare final payment
	Obtain consent of surety/final lien waivers
	Advertise for final payment
	Prepare notice of final acceptance
	Obtain most current set of as-builts
<b>Warranty</b>	
	Facility field staff monitor for failures
	Conduct a formal inspection and punch list 2 months before warranty period expires or make sure Contractor fixes or City collects on bond
<b>Archive</b>	
	Collect plans, specs, as-builts, O&M manuals, project correspondence, special reports, and organize into retrievable file form

Note: Checklist created from ASPEN Phases extended format

Table 2.4.3 The Official “Who’s Gonna Do What” Checklist (MOU DPR & PW)

ITEM	DPR	OTHER	COMPLETED
Lump Sum			
Unit Cost			
Design			
Design Data			
Project Scoping			
Budget			
Schedule			
Insurance Requirements			
Project Directory Complete			
Concept Plan Requirements			
Environmental Scoping Complete			
Planning Requirements			
Transportation Engineering Requirements			
Wastewater Requirements			
Survey Requirements			
ADA Requirements			
Right-of-Way Requirements			
Bridge/Structure Requirements			
Utility Companies Received Plans List			
Permits			
Environmental Services Requirements			
Revocable Permits Identified and Agreed To			
Maintenance Districts			
Miscellaneous			
Mayor’s Office of Art, Culture & Film			
Police & Fire Concurrence			
Verified to NOT be a Radium Site			
Undergrounding Requirements			
Funding Authorization			
Utility, Railroad and Consultant Agreements			
Consultant Selection			
Field Inspection Review (FIR)			
Public Hearings (contact info, announcement, schedule, run)			
Environmental Processes			
Design Approval			
Final Office Review (FOR)			
Rights-of-Way			
Plans, Specifications and Construction Cost Estimates			
Distribute plans and specs for review			
Distribute bid sets of plans			

Table 2.4.3 The Official "Who's Gonna Do What" Checklist (MOU DPR & PW)

ITEM	DPR	OTHER	COMPLETED
Review work site and plan details with bidders at Pre-Bid Conference			
MOCC goals			
Advertising			
Approve/reject low bidder			
Award contract			
Distribute construction plan sets			
Issue NTP			
Pre-Construction conference			
Pre-Surveying conference			
Construction Staking			
Monumentation			
Construction Administration			
Contract Administration			
Construction Supervision			
Force Account Justification			
Change order justification			
Change order authorization			
Construction Inspection			
Hardscape			
Softscape			
Construction Testing			
Hardscape			
Softscape			
Warranty Work			
Hardscape			
Softscape			
Progress meetings			
Who is in charge?			
Who will write and distribute meeting minutes?			
Construction Progress			
Monthly pay application meetings			
Forms submitted to			
Forms signed by			
Funding authorization for change			
Emergency notification			
Submittal coordination			
Submittal approval			
Hardscape			
Softscape			

Table 2.4.4 DPR Standards Checklist			
Y	N	NA	Item (Applies DPR Standard=Y)
<b>Site Analysis &amp; Site Work</b>			
Y	N	NA	Site Analysis
			Surveying
			Site Work
			Site Preparation
			Grading & Drainage
<b>Infrastructure</b>			
Y	N	NA	General Requirements
			Infrastructure Extensions To Serve Park Facilities
			Infrastructure Located Within ROW Adjoining Park Land
			Utility Corridors
			DPR Energy & Water Usage
<b>Hardscape</b>			
Y	N	NA	Walkways
			Stairs & Ramps
			Plazas
			Mow Strips
			Parking Lots
			Private Park Roads
<b>Landscape</b>			
Y	N	NA	Turf
			Planting Beds (Shrubs, Perennials, Groundcover)
			Park Trees
			Natural Areas
			Street/Plaza Trees
			Parking Lot Landscaping
			Landscape Maintenance
<b>Irrigation</b>			
Y	N	NA	General Requirements
			Sources Of Water
			Isolated Systems
			Water Meter, POC, Backflow Device
			Irrigation Heads
			Irrigation Controls
			Installation (Trenching, Piping, Sleeving, Wiring)
			Valves and Valve Boxes
			Thrust Blocks
			Pump Station
			Water Conservation Devices

<b>Structures</b>			
Y	N	NA	Item
			Shelters
			Kiosks
			Toilet Enclosures
			Ballfield Dugout Cover & Pressbox
			Restroom Facilities
			Portable Restroom Facilities
			Concession Facilities
			Maintenance Facilities & Work Stations
			Recreation Centers
			Bus Shelters
			Amphitheaters
			Historical Structures
			Park Ornamental Structures
			Boat/Fishing/Dock Facilities
			Bridges
<b>Program Elements</b>			
Y	N	NA	Trails
			Playgrounds
			Athletic Fields & Courts
			Dog Parks
			Skate Parks
			Disc Golf
<b>Furnishings</b>			
Y	N	NA	Picnic Tables
			Park Benches
			Drinking Fountains
			Barbecues
			Bicycle Racks
			Trash Receptacles
			Trash Dumpsters
			Fences
			Fence Gates
			Walls
			Signage
			Lighting
<b>Water Features &amp; Lakes</b>			
Y	N	NA	Water Features
			Lakes & Ponds
<b>Art in Parks</b>			
Y	N	NA	Art in Parks
<b>Parkways and Boulevards</b>			
Y	N	NA	Parkways and Boulevards
<b>Medians and Traffic Islands</b>			
Y	N	NA	Medians and Traffic Islands



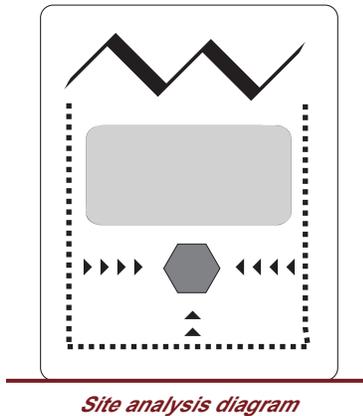
## 3 . Design & Development

In addition to these Standards, refer to DPR specifications and details.

### 3.1 Site Analysis & Site Work

---

#### 3.1.1 Site Analysis



*Site analysis diagram*

Park design and site planning shall include analysis and integration of on-site and off-site features such as: bicycle and pedestrian trails, open space areas, topography, views, existing vegetation, natural areas, wildlife populations, historical features and joint-use needs of adjacent schools. Community plans, master plans, general development plans and other City planning documents should be referenced when analyzing and evaluating the project during site planning.

View preservation areas have been established by Ordinance (Chapter 10 Art. IV. Restrictions on Structures Within Areas Necessary to Preserve Mountain Views, §§ 10-56--10-80) that provide limitations on construction within designated areas, including Cranmer, Cheesman, Ruby Hill, Harvard Gulch, Civic Center, Washington, City, Southmoor, Sloan's Lake, 51st & Zuni and Hirshorn Parks. Also, under Executive Order 100, when acquiring new property through purchase or deed, Environmental Health must be involved.

##### 3.1.1.1 Sustainability in Design

The City of Denver through its Greenprint Denver Initiative has made sustainability a key aspect of design and construction in the City. Executive Order 123 lays the policy groundwork for this approach. (Attachment 1). The main goal of Greenprint Denver is to balance short and long-term economic, social and environmental considerations thus providing a sustainable environment and a high quality of life for all Denverites. Key objectives of the policy are to:

- Reduce Greenhouse Emissions
- Increase City Forest Coverage
- Reduce Waste
- Utilize Renewable Energies
- Promote Green Building
- Promote Mass Transit
- Improve, Protect and Conserve Water

To ensure a successful project outcome, sustainability objectives need to be integrated in the design process from the earliest conception of the project. Greenprint Denver has created a Sustainability Checklist based on LEED principles to facilitate the inclusion of sustainable practices in the design and construction process. (Attachment 2). The checklist touches on most objectives set in Executive Order 123 and is organized by horizontal and vertical projects.

Selection of the project stakeholders is important from a sustainability perspective. Maintenance staff needs to be included to guarantee that a project is sustainable beyond the construction and into the maintenance phase. Maintenance and life cycle costs should be included in the project budgeting process.

### 3.1.2 Surveying

Surveying coordinates shall comply with the CCD GIS department.

### 3.1.3 Site Work

The purpose of compliance with specifications ensures that a site is ready for construction, is a safe environment in which to work, and produces a safe built product.

### 3.1.4 Site Preparation

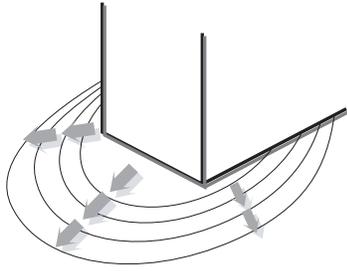
Verify all of the following that apply to your project with the Project Manager before beginning construction: location of utilities, verification of pressure, location and protection of remnant native plant communities and wildlife habitat, property protection, tree protection, trail protection/detour, erosion control, site layout verification, construction facilities and temporary controls and contamination verification.

### 3.1.5 Grading & Drainage

Grading. Grade areas within drawing and specification tolerances within the project limits, as well as adjacent transition areas. Under no circumstances shall variations from specified grade elevations create any ponding or retention of water on walks, plazas or finished surfaces. Grading should comply with ADA standards. Grading operations, with the exception of fine grading, shall be completed and approved, in writing, by Project Manager before staking or installation of any irrigation system begins.



*Rolling hills give variation to trail users (City of Cuernavaca Park)*



*Positive drainage*

Finished Grade. Finish grade for lawn areas and planting areas shall be 1" below walks, mow strips or other paving.

Drainage. All park projects shall direct drainage away from buildings, electrical enclosures, backstops and irrigation controllers, and all projects shall have the necessary components for drainage. Provide for opportunities to keep water on site where possible. See specification for acceptable products.



*Grading requirements direct that slopes greater than a 4:1 cannot be turf, but do allow for shrubs and groundcover.*

Table 3.1.5.1 Grading Requirements	
Use	Grade
Paving (walkways and plazas including concrete, asphalt or unit pavers)	Paving within parks shall meet current ADA accessibility guidelines
Crusher Fines Paths	4% max
Parking Areas	1% min - 4% max
Turf & Natural Areas	2% min - 25% max (4:1)
Shrub and Groundcover Areas	2% min - 33% max (3:1)
Mulch Areas	2% min - 33% max (3:1)
Basketball and Volleyball Courts	Drain end to end at 1% for concrete and 2% for asphalt
Tennis Courts	Drain side to side or end to end at 1%, never allow high point at net
Multi-Purpose Fields	2% min to 2.5% max
Softball Fields	1.5% for skinned and turf infields, outfield turf; provide positive drainage away from home plate in all cases



## 3.2 Infrastructure

### 3.2.1 General Requirements



*Construction in a park requires a Construction and Access Permit*

**Infrastructure Design.** Collaboration between approval-administering parties is essential for infrastructure design. Collaboration should occur at the concept level in order to maximize opportunities for shared uses and costs, as well as foster an environment for a positive partnership. DPR currently has an MOU with Public Works.

**Notice.** A DPR Construction and Access Permit is required prior to any activity that will impact DPR facilities (parks, parkways, recreation centers, golf courses, trails, medians, etc.). This includes access across or through DPR property. An anticipated start and completion date must be submitted with the permit; and this information will be forwarded on to the Park Superintendent by DPR. However, due to the variability of construction schedules, notice shall be given to the Park Superintendent by the Permittee 24 hours prior to work being done so that the Superintendent can be made aware of other workers in the area. Work crews shall carry a copy of the approved Construction and Access Permit while on DPR property. Work crews shall not park trucks or heavy equipment on Parks property unless absolutely necessary. In an emergency situation, notice shall be given no later than 24 hours after the work has been completed.

**Coordination & Impacts.** In accordance with Chapter 39 Sec 39-6, it is unlawful to destroy any park property. Destruction of Parks property by non-Parks work crews shall be repaired or DPR will issue a bill to cover the costs of damage and labor. Landscaping shall not interfere with the general function, safety or accessibility of any existing gas, electric, water, sewer, telephone, drainage facilities, or other drainage or utility easements. For example, landscaping adjacent to overhead utility lines must take into account mature size and shape of plantings, and minimize potential conflicts. Likewise, proposed utilities shall not interfere with existing landscaping and irrigation. Improvements to existing park infrastructure may need to be made, at cost to the installing utility, in order to safely locate within a park or a ROW adjacent to a park. For example, if installation of a utility in ROW adjacent to a park was deemed necessary, it would be the responsibility of the utility to locate their infrastructure in such a way that does not impact existing tree roots, irrigation lines and irrigation head locations. This allows DPR to protect workers from unsafe working conditions and protect existing infrastructure and street trees.

**Installation.** Infrastructure shall be installed according to the approved plans submitted with the Construction and Access Permit. Should changes occur, approval must be given by DPR in order to continue construction.

Utilities shall use sleeving when crossing beneath pavement and in certain unique situations deemed necessary by the Project Manager.

### 3.2.2 Infrastructure Extensions To Serve Park Facilities

Table 3.2.2.1 provides a brief summary of park system infrastructure components that require other entity involvement during concept development. This list is

not comprehensive and requirements may be different from project to project. Other departments that may require permits:

- Community Planning & Development (CPD), Building Inspection Division (BID), Fire, BID Health.
- Landmark (all proposed work to a designated landmark/historical structure)
- Zoning Administration

Table 3.2.2.1 Park Infrastructure				
Component	Design Elements	Reviewing Entity in Addition to DPR	Design Standards from Reviewing Entity	Permits from Reviewing Entities may include:
Water System	Irrigation, Taps, Meters, Hydrants, Non-potable water	Denver Water, Fire Dept.	Denver Water Engineering Standards & Operating Rules	Hydrant Permits, Purchase Taps, Plan Review, Revocable Permits
Stormwater/Water Quality	Stormwater	Public Works, Env. Health	Storm Drainage Criteria Manual, Water Quality Mgmt Plan	Sewer Use & Drainage Permit (SUDP), Private On-Site Storm Sewer, State Temp. Discharge Permit (CDPHE)
Green Infrastructure	BMPs, Bioswales, Habitat	Public Works, Env. Health	Urban Drainage Manual Vol. 3	
Sanitary Sewer	Sanitary	Public Works, Env. Health	Sanitary Sewer Criteria Manual	SUDP, Private On-Site Sanitary Sewer
Gas & Electric	Lighting, Power	Xcel	Xcel Energy Standards for Electric Installation and Use	
Communications	Telecom/IT/Cable	Qwest, Comcast		
Private Streets	Roads through parks		DPR Standards	
Private to Public Street Transition	Curb cuts, ramps	Public Works	PW Street Cross-sections	
Public Streets	Local, Collector & Arterial roads through parks	Public Works	PW Street Cross-sections	Street Occupancy Permit, Street Closure Permit, Street Cut Permit
Medians & Parkways	Median design	Public Works	DPR Standards, PW Street Cross-sections	Forestry Permit, DPR Maintenance Agreement, ROW Construction Permit
Floodplain	Design in floodplain	Public Works	Storm Drainage Criteria Manual	Flood Plain Permit
Contaminant Assessment	ID potential contaminant areas	Env. Health	Environmental Health Standards	

Layout. Infrastructure extensions to serve park facilities (not in the ROW) should be laid out in a uniform manner in order to create efficiencies in maintenance and prevent unsafe working conditions. The following table recommends minimum and preferred depths at which utilities should be located within parks. Should a utility cross an irrigation main line within a park, the utility shall cross at a 90-

degree angle when practical. A utilities ascent to the surface, or daylighting, should be made as quickly as possible to avoid confusion in utility depth.

Table 3.2.2.2 Utility Depths			
Utility	Min. Depth*	Min. Clearance	Pref. Depth*
Water	4.5'	18"	4.5
Electric-service lines**	2'	12"	4'
Electric-main lines**	2.5'	12"	3'
Gas**	2'	12"	5'
Sanitary Sewer	See PW	12"	6'
Stormwater	See PW	12"	5'

\* Depth is from Finished Grade to top of pipe

\*\* Depth of bury shall meet the criteria as established by the National Electrical Safety Code (NESC) for electric systems and Department of Transportation for gas systems. Clearances and depth of bury may be reduced for joint trenches with approval.

Streets. Public streets through parks shall be coordinated jointly by DPR and Public Works. Private park roads (non-dedicated ROW) shall be determined by DPR. Principles that apply to Parks roads may not be the same as public ROW streets.

Fire. Landscaping around fire hydrants, including adjacent vegetation height and setbacks, should be approved by Denver Water’s Sales Administration Section and should comply with the current fire code.



*Stormwater as a park element  
(Greenway Park)*

Stormwater & Best Management Practices (BMPs). When entering into design concept level for drainage, it is the intent of DPR to encourage the integration of drainage systems into the park as features, the use of drainage to increase flora and fauna diversity, and the improvement of water quality where possible.

The Denver Storm Drainage Criteria Manual should be used to ensure that a park stormwater management plan functions in accordance with City policy, guidelines and criteria. The design of a stormwater management plan shall be reviewed and approved by the DPR Project Manager.

The UDFCD (Urban Drainage & Flood Control District) Urban Storm Drainage Criteria Manual provides both an overview and specific detailing that deals with Stormwater Quality Management, New Development BMPs, Industrial and Commercial BMPs, and Construction, Structural and Nonstructural BMPs. Figure 3.2.3, an excerpt from the Manual, shows the many planning options for stormwater BMPs.

VOLUME 3 BMP  
PLANNING  
SECTION

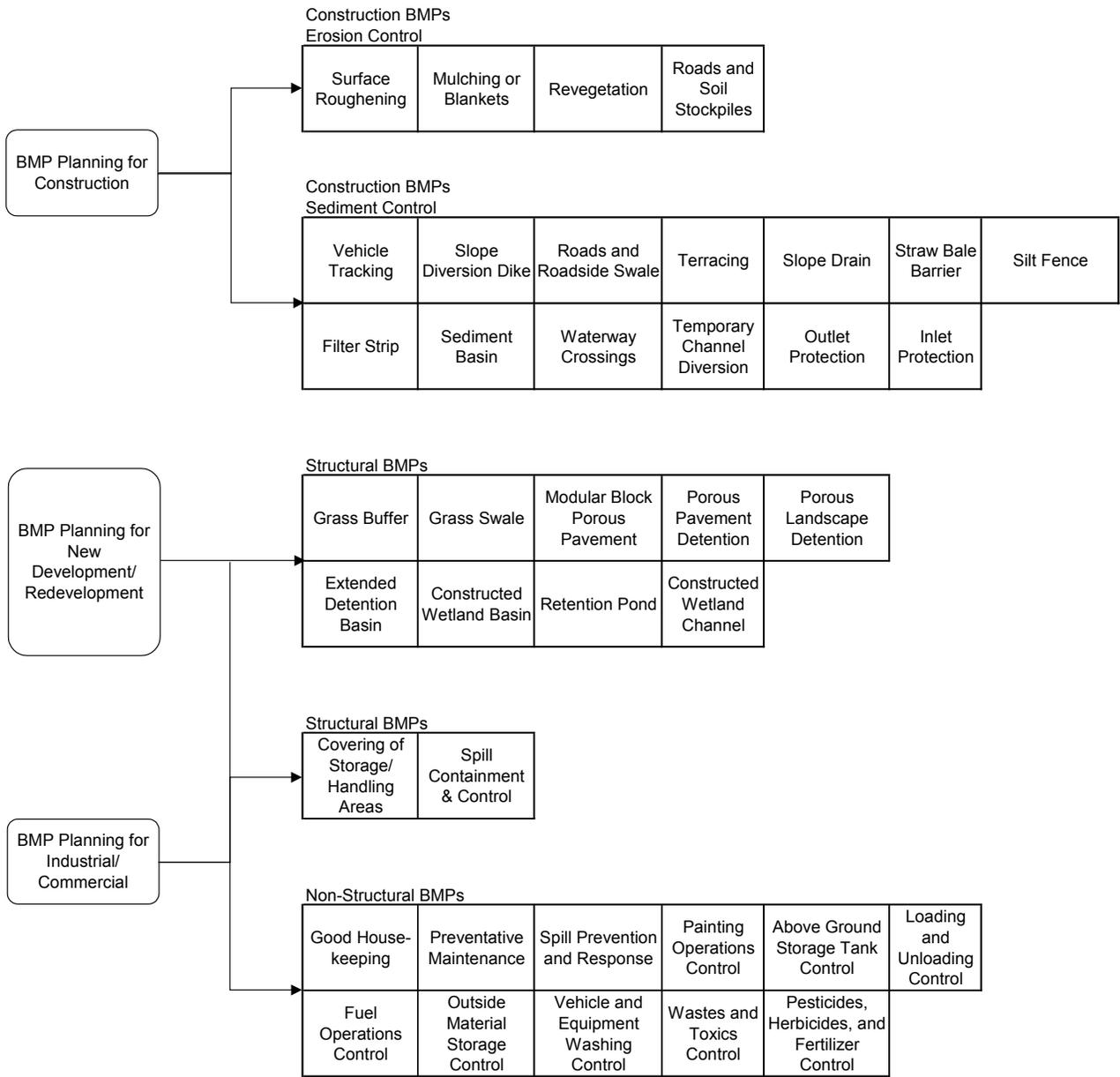
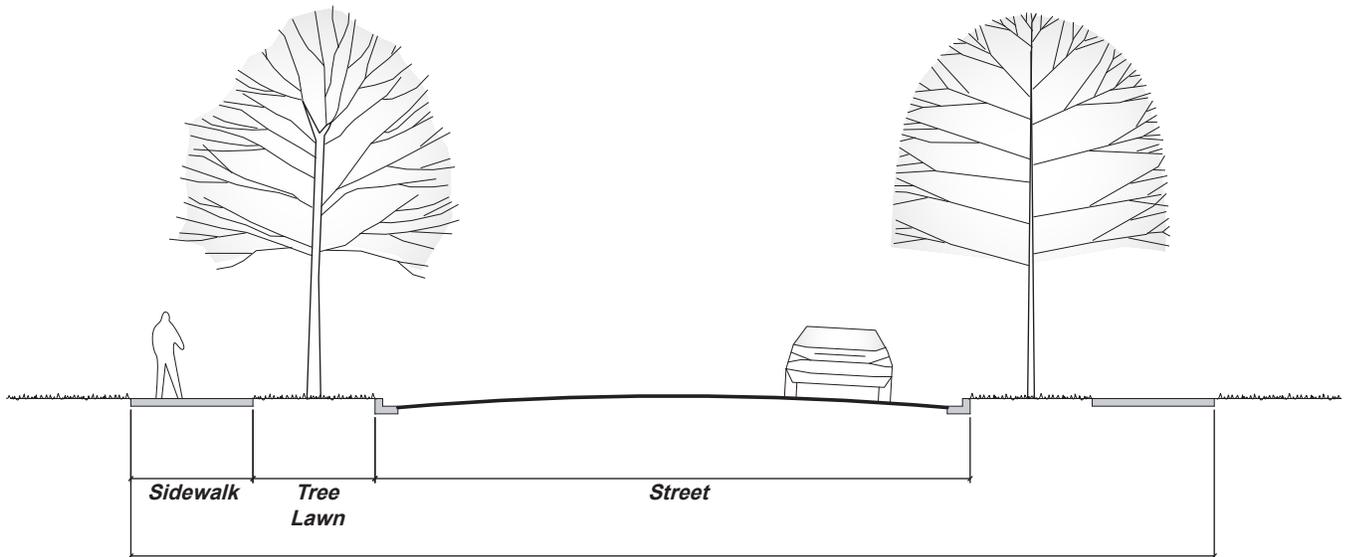


Figure 3.2.3 UDFCD Urban Storm Drainage Criteria Manual: BMP Planning Flow Diagram

### 3.2.3 Infrastructure Located Within ROW Adjoining Park Land

ROW adjoining park land is reviewed by the CCD Public Works Department. Standard Right-of-Way Cross Sections and Utility Locations define the general area where wet and dry utilities can be installed. ROW varies from park to park; therefore, the existing ROW map shall be consulted for accurate ROW information. It is the expectation of both DPR and Public Works that ROW adjoining parks will be maintained by DPR to back of curb.

In ROW adjoining park land, it is the strong recommendation of Denver Parks & Recreation that dry utilities be installed under sidewalks or in streets to protect workers from unsafe working conditions and protect existing infrastructure and street trees. The utility provider shall coordinate with DPR.



*ROW typically includes sidewalk, tree lawn and street. However, ROW sometimes only includes back of curb to back of curb (street).*

*ROW diagram*



**Utility corridors  
(Ruby Hill Park)**

### 3.2.4 Utility Corridors

Refer to DPR Utility Policy in regards to existing or proposed locations for utilities.

### 3.2.5 DPR Energy & Water Usage

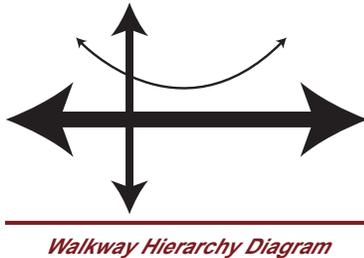
Energy and water policies that directly impact DPR should be reviewed and approved by the Manager of DPR.



### 3.3 Hardscape

Hardscape is used to provide gathering places and direct circulation within a park. Circulation within parks encompasses vehicular modes as well as alternative forms of transportation such as bicycling, walking, rollerblading, etc. Trails are discussed in the Program Elements section.

#### 3.3.1 Walkways



The purpose of walkways is to highlight pedestrian circulation routes through a park and provide a durable surface on which to walk these routes. Pedestrian circulation should connect people to program elements, special features, and parking; however, some walkways just provide a place for recreational walking. Looped walkway systems, as well as perimeter walks within the ROW, are preferred. Entrances to parks are emphasized by walkways and these should be located in a logical, convenient and aesthetic manner. Where possible, walkways shall link to existing and proposed trail networks. Coordinate with Public Works to ensure connectivity within the ROW and through adjacent neighborhoods.

**Primary walkways.** The purpose of primary walkways is to formalize the primary pedestrian circulation route, provide accessibility to all users and allow emergency and maintenance vehicle access. Primary walkways should include security lighting and be composed of concrete. Provide a minimum 20' radius at intersections.

**Secondary walkways.** Secondary walkways support circulation patterns and serve aesthetic aspects such as dividing landscape types or program elements. These walkways can be composed of concrete, crusher fines, asphalt, pavers, etc., but must be an ADA accessible surface. Security lighting on secondary walkways should be determined on a case by case basis.

**Tertiary walkways.** Tertiary walkways tend to provide access to more private and secluded areas and may not have the formalness of primary and secondary walkways. These walkways may use alternative paving materials such as crusher fines or other porous materials. There will be no plowing on tertiary walkways and this should be considered in the design of the walkways. Trails in Natural Areas may be classified as tertiary trails and can be designed as soft-surface, low-impact trails a minimum of four feet wide.



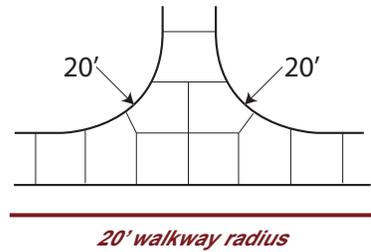
*A primary walkway and secondary walkway intersect.*

Layout.

Table 3.3.1.1 Walkway Layout	
Type of Walkway	Width
Primary walkway	10' wide (min.)
Primary walkway adjacent to ball field lights (should accommodate vehicles with outriggers)	12' wide (min.)
Walkways in front of parking stalls without wheel stops	9' wide (min.)
Secondary Walkways	6' wide (min.)
Tertiary Walkways	4' wide (min.)

Walkways in ROW	Follow PW street cross-section standards
-----------------	--

Walkway Design. Concrete walkways should be approved for alignment and grade. Radii shall be continuous and flowing to avoid angular intersections in the horizontal alignment. A minimum 20-foot radius shall be used for connections along primary walkways and secondary walkways requiring plowing in the winter. All concrete walkways shall have a broom finish. Walkway expansion and control joints should be located and constructed in accordance with specifications.



Soft Surface Trails. Soft surface or crusher fines trails are appropriate materials for secondary or tertiary pedestrian trails that are not plowed in winter. Care should be taken to minimize the migration of crusher fines onto adjacent paved areas as this can result in a slippery walking condition. Wherever possible and especially on sloped areas, crusher fines trails shall be stabilized with Soiltac or equal. Soiltac is a liquid additive and is available from Bowman Construction Supply (Tom Bowman 303.696.8960).

Non-concrete walkways should be approved for alignment and grade and shall be designed to prevent weeds and ensure a consistent trail cross-section through the use of stabilizer, if necessary. Use edging where appropriate. See specifications for acceptable materials.

Handicap Ramps. Ramps shall be designed in accordance with current Public Works standards. Handicap ramps are required at all primary and secondary walkways.

### 3.3.2 Stairs & Ramps

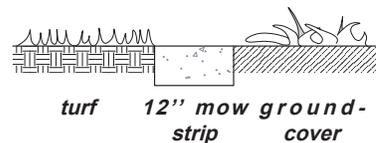
Stairs and ramps shall comply with ADA guidelines. Open risers are not permitted under ADA. Specifics on treads and risers, nosings, handrails and detectable warnings are given in the ADA guidelines. Additionally, the maximum height between landings, on stairs, should be five feet. To prevent potential tripping hazards, single steps should be avoided. For ramps, specifics on width, slope, landings, handrails, edge protection and outdoor conditions are given in the ADA guidelines.



*Stairs and ramps (Confluence Park)*

### 3.3.3 Plazas

Plazas shall comply with ADA standards, provide the ability to accommodate a wide variety of functions/events in the space, and should have positive drainage away from buildings. Expansion and control joints should be provided to functionally manage cracking and to aesthetically add to the plaza design. Provide for lighting, electric power and a water source.



*Mow Strip*

### 3.3.4 Mow Strips

Concrete mow strips shall be provided to separate all lawn areas from natural areas, under fencing, where fencing is adjacent to turf or ground cover that requires edging or mowing, as an integral component of any wall. Mow strip width shall be a minimum 12 inches wide. No metal edging is allowed in parks for safety reasons.



*A mow strip separates turf from a natural area.*

### 3.3.5 Parking Lots

Building Parking Requirements. Parking standards for all park buildings shall comply with the City and County of Denver Zoning Code Article VI Off-Street Parking Requirements. The following table shows the Zoning Code parking class based on primary use of a park building.

Table 3.3.5.1 Zoning Code Parking Class	
Primary Use	Parking Class
Recreation Center (Indoor Facility)	Class Four
Event Facilities/Vendors	Class Four
Maintenance Garage (auto repair)	Class Eight
Office	Class Nine
Golf Pro Shop	Class Four
Museums/ Libraries	Class Two

Program Element Parking Requirements. Parking standards for program elements are established by DPR and the following table is offered as a guide. Parking numbers may be achieved through the use of both on-street parking and off-street parking, in the park and adjacent to the park, to be determined by the Project Manager. Parking areas should provide preferred parking for carpools and vanpools in addition to required accessible spaces. Meet accessibility guidelines for both on-street and off-street parking. Partnerships and shared use parking is encouraged. Provide drop off areas within the park, where appropriate. Parking should be located, if possible, near the activity it is intended to serve. A desirable distance is within 250 to 300-feet, and no more than 400-feet from the activity.

Table 3.3.5.2 Parking Guidelines	
Primary Use	Parking Ratio (min)
Multi-Purpose Fields	15 per field - 30 per field*
Tennis Courts	2 per court - 4 per court*
Basketball Courts	5 per court - 10 per court*
Baseball/Softball Fields	20 per field - 40 per field*
Skatepark	1 space for every 600 sq. ft.
Dog Park	Regional: 25 per acre Neighborhood: 5 per acre
Trail Heads	Regional Trail: 5 per mile Minor/Nbhd Trail: Determine as needed
Regional Playgrounds	1 space for every 600 sq. ft.
Permittable Picnic Shelters	1 space for every 100 sq. ft.
Outdoor Event Facilities	1 space for every 4 seats or 1 space for every 50 sq. ft. gross floor area
Marinas	0.7 spaces for every berth or mooring, Marinas: 2 spaces for every 3 employees on the maximum shift, plus 1 space for every vehicle customarily used in operation of the use or stored on the premises
* Higher range numbers should be used for Athletic Field Complexes that will need more parking for tournaments, etc.	

---

Layout. Parking layout shall comply with the City and County of Denver Zoning Code Article VI Off-Street Parking Requirements.

On-street Parking. In order to provide the public access to parks, public streets generally surround Denver parks. Coordinate with Public Works to provide on-street parking adjoining parks on all streets, where appropriate.

Bicycle Parking. Bicycle parking at park buildings should provide for 15% or more of building occupants. Bicycle parking for program elements should be 10% of vehicular spaces.

### 3.3.6 Private Park Roads

General Requirements. Private park roads should be designed to connect participants to program elements as deemed necessary by the Project Manager. Private park roads should only be included within parks when necessary and should discourage through-traffic to the greatest extent possible. Roads should be wide enough to accommodate on-street parking to meet parking requirements for program elements. Private roads shall provide for emergency access and clear sight triangles and should also consider accommodating bike lanes, traffic calming devices and bus stops where applicable.

## 3.4 Landscape

**Landscape Design.** Landscape should aesthetically complement and enhance the overall design of a park. However, landscape within a park should also serve a functional purpose. Turf should be located in general use and programmed use areas and in tree lawns. Low-water turf should be used in other non-programmed areas as an alternative to water-intensive turf. The aesthetics of planting beds should be weighed against maintenance considerations. Planting beds should be used in: highly visible areas to enhance entry, transition areas to separate uses, steeply sloped areas to prevent erosion, and specialty gardens as a program element. Trees are an important part of any park and should: provide shade and seasonal interest, screen views, enhance the uniqueness of a site and highlight axes and formal designs. Natural areas landscape should fit within the native context, enhance wildlife, promote species diversity, and protect remnant habitats. Also, refer to section 3.5.1 on irrigation design and the use of hydrozones when selecting plants.

**Plant Layout.** Plants should be grouped by water requirements in order to comply with Irrigation Hydrozone Standards. Plant locations and spacing shall permit normal plant development without undue crowding or trimming. Shrubs, groundcover and vines should be spaced at a minimum of one-half of their mature diameter from all walkways to prevent overcrowding and impeding on walkways. See Grading Standards for appropriate vegetation in accordance with slope. Where possible, provide walkways to separate lawn areas from shrub and groundcover areas to reduce edging costs. No metal edging is allowed in parks for safety reasons. Mulch should be applied to all planting beds and underneath trees; see specifications for acceptable products.

**Plant Selection.** In accordance with the Game Plan, all new parks and new construction in existing parks should contain naturalized areas and drought resistant plants to promote water conservation and reduce maintenance costs. Plant selection shall be those species which are considered relatively disease and pest-free and require minimal trimming to be maintained in a safe and attractive condition. The Parks and Recreation Department retains the right to prohibit any plant material generally known to require excessive maintenance because of factors such as, but not limited to, disease, pest control, troublesome root development, ultimate size and difficult growth habits.

Plant	Size
Deciduous shade trees	2-inch caliper
Ornamental trees	2-inch caliper
Evergreen trees	6 foot height
Multi-stem ornamental trees	8 -10 foot height
Shrubs	5 gallon container
Vines	1-gallon container
Ground cover/perennials	2-1/4 inch pots

**Installation Criteria.** A horticultural suitability soil test shall be obtained and

the results and recommendations shall be incorporated into the construction plans and specifications. The test results shall determine the type and rate of soil amendments, if leaching is a requirement, and the details of future maintenance requirements. The following table provides an installation calendar for landscape material.

Table 3.4.0.2 Vegetation Installation & Protection Period		
Vegetation	Installation	Vegetation Protection Period
Turf - Seed	April 15-June 1 & Aug 15-Oct 1	1 year
Turf - Sod	April 15-Oct 1	1 year
Turf - Athletic Fields (seed & sod)	April 15-Oct 1	2 years
Shrubs/Grndcvr	April 15-Oct 1	1 year
Trees	April 15-June 15 & Sept 1- Oct 31	2 years
Native Seeding (Irrigated)	Spring thaw: April 15-Aug 20 & Dormant seeding: Oct 15-April 15	1 year
Native Seeding (Non-Irrigated)	Oct 15 - April 15	1 year

Preservation of Existing Vegetation. Existing vegetation should be analyzed to determine its value to a park. Tree size and function, remnant native plant communities, and wildlife habitat are examples of criteria by which to judge plant value. See specifications for requirements in regards to tree retention and protection.

### 3.4.1 Turf

Lawn areas should be of a size and configuration to permit the most effective use of mechanized maintenance equipment and reduce lawn edging. Small, decorative lawn areas are discouraged. Turf areas less than 6-feet in width are discouraged because spray irrigation is prohibited and only low-flow irrigation systems are allowed.

Seed. Generally, turf areas are a blend of 90% Bluegrass and 10% Ryegrass, or a 100% Bluegrass. See specifications for acceptable products and application rates.

Sod. Generally, turf sod areas are a Colorado grown Kentucky Bluegrass. See specifications for acceptable products.

Athletic Field Turf. Athletic field turf should be a Bluegrass blend with improved, drought resistant varieties, and suitable for vigorous athletic field use.

Low-water Turf. Low-water turf can be defined as grasses that demand less water than bluegrass turf and may feature native species within their blends. A Short Grass Mix and a Mid Grass Mix, found in DPR specifications, can be considered low-water turf. Fescue turf with a low bluegrass content can also be considered low-water turf.

Establishment & Vegetation Protection Periods. Consult specifications for establishment requirements and refer to Table 3.4.0.2 for vegetation protection periods.



*Flower beds at Cheesman Park (top) and Harvard Gulch (bottom)*

Temporary Seed. Temporary seeding should occur where disturbed areas have a period of exposure of one year. Plant a temporary cover crop. DPR acceptable grasses include Six Weeks Fescue, Slender Wheatgrass, Bottlebrush Squirreltail, Sand Dropseed, and Purple Threawn.

Fertilization/Herbicides. Fertilization should be used only when necessary and should be based on soil samples and plant performance. Handle fertilizer with care and avoid pollution of waterways. Citizens requesting notification of spraying are required to submit demographic information including name, address and phone number, with the name of up to three parks, to Environmental Health.

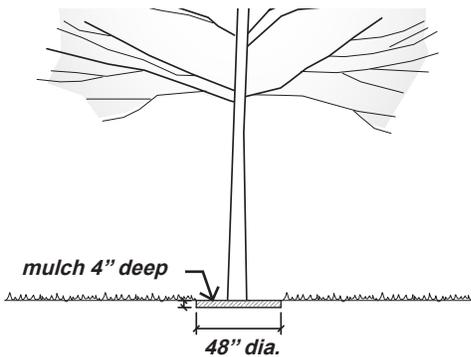
### 3.4.2 Planting Beds (Shrubs, Perennials, Groundcover)

Planting beds and vegetation heights shall not impede on site triangles at intersections or signage. Planting beds should achieve year-round visual interest through plant selection (i.e., deciduous and evergreen materials, ornamental grasses, varied blooming schedules). Plant shrubs and perennials in groupings in order to achieve a proper massing of vegetation. Small planting areas are discouraged. See section 3.12 for further information on median planting beds.

Layout & Plant Selection. Groundcover shall be designed with triangular spacing at a distance that will typically ensure 100 percent coverage within two years of installation. Provide plants that are well established and rooted in removable containers with not less than the minimum number and length of branches required by the Colorado Nursery Act for the pot size indicated.

### 3.4.3 Park Trees

Species diversity is a primary goal of DPR. No more than ten percent of the total number of trees in a plan should be of the same species. Trees should provide shade and seasonal interest, screen views, enhance the uniqueness of a site and highlight axes and formal designs. See the City Forester for a list of approved trees.



*Tree Mulch*

Tree Layout. Trees planted in turf areas shall be spaced to permit the most effective use of mechanized maintenance equipment and operation of irrigation system. There should be 15 feet between trees and other vertical objects in the park. For all trees installed in turf areas, provide the specified bark mulch 4-inches deep in a minimum 48-inch diameter around the tree. Trees shall be staked according to specifications and details. Groves of trees are encouraged, where appropriate, for water conservation.

Shade, coniferous and ornamental trees should all be chosen in conformance with the Colorado Nursery Act.

### 3.4.4 Natural Areas

In accordance with the City Charter (Ch. 39, Art. VIII. Natural Areas), Natural Areas adopted Rules and Regulations on January 11, 2001. The Rules and Regulations set out classifications, criteria, procedures and public process for designating Natural Areas, as well as regulatory requirements for controlling public access to and use of Natural Areas.

Natural Areas Design. Natural area landscapes should comply with the criteria necessary for Natural Area designation:

- Provide or could provide protection for a sustainable natural ecosystem, wildlife habitat, native plant species and communities, geological formations or water corridors or wetlands;
- Serve as an example of a rare or unique native condition in an urban setting in need of ecological preservation;
- Serve as an outdoor classroom or laboratory for scientific study or other educational opportunities for the public;
- Function as an area of biological diversity, natural beauty, and inspiration which meets aesthetic needs and which enriches the meaning and enjoyment of human life.

All furnishings, amenities, and signage in natural areas shall meet all specifications and be of the same quality as those in traditional parks. Refer to Section 3.8 Furnishings for detailed standards for natural areas benches and fencing. The decision on whether to irrigate and what type of irrigation system to be used shall be made by the Project Manager and City Naturalist. The City Naturalist shall approve all site plans, plant specifications, schedules, and plans in natural areas. See specifications for acceptable products and application rates for seed mixes including Short Grass Mix, Mid Grass Mix, Sandhill Prairie Mix, Riparian Prairie Mix, Wetland Mix and Native Wildflower Mix. Prairie sod is prohibited within park land. The City Naturalist shall approve all plant schedules and planting plans in Natural Areas.

Natural Areas Classifications. One of four classifications will be placed on a site to be designated as a Natural Area, in keeping with existing conditions on the site and appropriate public use, if any, of the site.

Natural Areas:
CHAPTER 39 ARTICLE VIII Natural area. A geographical area of land of either geologic or biologic significance which retains, has had reestablished, or has the potential to reestablish many aspects of its natural character. Such an area could now or in the future support native vegetation, associated biological and geological features, or provide habitat for indigenous wildlife or plant species. Such an area could host geological, scenic, or other natural features of scientific, aesthetic, or educational value.
In accordance with DPR Natural Areas Rules and Regulations, Natural Areas are separated into four use categories: Active Use Natural Areas, Conservation & Restoration Areas, Potential Native Areas, and Preservation Areas.

**Table 3.4.4.1 Natural Area Classifications**

Classification	Description	Goal of Designation	Management	Allowed Uses
Active Use	These areas should demonstrate important natural features or include native plant or wildlife habitat. These areas will allow for limited active recreational facilities, such as surfaced trails or fishing piers, and for other facilities that will attract public use.	<ol style="list-style-type: none"> <li>1. To provide recognition of the value of the natural features in the area</li> <li>2. To trigger restorative projects that could establish or reestablish native planting and appropriate wildlife habitat</li> <li>3. To ensure that all construction and earth-disturbing activity done in the area is sensitive to the natural aspects of the area</li> </ol>	Will include what is typical for active park and recreational facilities. Expertise will be sought for restorative projects.	No uses will be allowed that are not allowed in City parks. Picnicking, biking, rollerblading or roller-skating, horseback riding, hiking, meetings of large groups, and pets are allowed only in authorized areas and under such conditions or restrictions as will prevent any notable impacts to natural aspects of the area.
Conservation & Restoration Areas	These areas have or will have the potential to restore significant natural features, native plant communities, or wildlife habitat. Activities will be geared toward the appreciation of the natural aspects of these areas.	<ol style="list-style-type: none"> <li>1. To provide recognition of the natural significance of the area or the wildlife in the area</li> <li>2. To ensure that the area remains in its natural state and that restoration be actively pursued or allowed to occur naturally</li> </ol>	Will be directed towards protecting areas by limiting formal or informal activities to those that will have little or no impact on the area. Restrictions on public access and use should be posted and enforced.	No uses will be allowed that are not allowed in Active Use Areas. Authorized areas for public access and use, as allowed in Active Use Natural Areas, will be fewer and more restricted. Some areas of land may be closed, permanently or temporarily, to public access in order to allow for conservation or restoration.
Potential Native Areas	These areas consist of open space found in such areas as along parkways and roadways, slope cutaways, open fields, undeveloped land between developed properties, buffer areas, areas along railroad tracks, and the like.	<ol style="list-style-type: none"> <li>1. To take unappealing, neglected, or underutilized open space and improve its value and aesthetics</li> <li>2. To provide, where appropriate, wildlife corridors and sustainable, naturalized landscapes</li> <li>3. To conserve natural resources and reduce maintenance</li> </ol>	Will be directed towards promoting self-sustaining native growths that require minimal maintenance. Active or passive public access or use will be allowed as appropriate for a specific site.	No uses will be allowed that are not allowed in Active Use Natural Areas. Authorized areas for public access and use, allowed in the Active Use Natural Areas, will vary depending on the given circumstances. Some areas of land may be closed to public access, temporarily or permanently, in order to allow for recovery of native vegetation or erosion control.
Preservation Areas	These are typically areas of pristine or near pristine character that require special protection of their natural features or control of the environment for the protection of wildlife and its habitat. These areas could contain sensitive natural elements or are notable for their unique scenic value.	<ol style="list-style-type: none"> <li>1. To preserve and protect the area as is</li> <li>2. To restrict human activity to a minimum</li> </ol>	Will be directed towards maximum protection of resources and public education. Areas will be typically closed to direct public access and use, and these restrictions should be posted and enforced.	No uses will be allowed in the area that are not expressly authorized for the purposes of preservation and protection of the area or supervised public education activities in the area. The area will be closed to public access and use, except for viewing outside the area.

Excerpted from the Natural Areas Rules and Regulations.

Weed Management. Weed management is an essential tool for promoting the health and vitality of Natural Areas. The Noxious Weed List, available from Natural Resources, provides information on plants that are prohibited.

### 3.4.5 Street/Plaza Trees

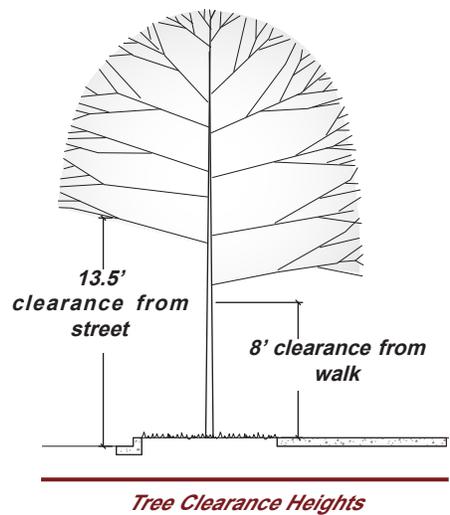
Permits are required for planting, pruning, or removing trees in the public ROW under Article II, Section 57-20 of the Revised Municipal Code. Permits may be obtained from the DPR Forestry Division. Parkway and boulevard standards can be found in “Denver’s Designated Parkways and Boulevards”. Article II, Section 57 of the Revised Municipal Code also establishes the authority of the City Forester to institute rules and regulations for the planting and maintaining of trees on any public right-of-way or other public place in the city.

Street Tree Selection. Choosing the right tree for a site promotes health and longevity. Ornamental trees should be used only when overhead utility lines are present, as their lower height makes it more difficult to meet clearance guidelines above streets (13’-6”) and sidewalks (8’-0”). See Appendix D for the current approved and prohibited street trees. Contact the Forestry office for the yearly updates to this list.

DPR Forestry requires diversity of street trees to ensure the sustainability of Denver’s urban forest. The 10-20-30 Standard shall be: no more than 10% of one species, no more than 20% of one genus, and no more than 30% of one family). For example, using the *Acer saccharum* v Green Mountain, if 100 trees are planted in a plan, no more than 10 should be of the *saccharum* species, no more than 20 should be of the *Acer* genus, and no more than 30 should be of the *Aceraceae* family. Forestry may grant exceptions to the 10-20-30 standard under special circumstances.

Street Tree Layout. Spacing requirements for street trees are listed in the following table.

Table 3.4.5.1 Street Tree Spacing Requirements		
	Requirement	Spacing
Horizontal	Between shade trees	35'
	Between ornamental trees	25'
	From curb at intersections	30'
	From street lights	20'
	From alleys & driveway curb cuts (not including flare)	10'
	From fire hydrants	10'
	From stop signs	20'
	From attached sidewalks	7'
Vert	Clearance above street	13.5'
	Clearance above sidewalk	8'



---

Root Barriers. Root barriers may be needed in special situations, as determined by the City Forester. When applicable, the root barrier shall be installed adjacent to the walkway or wall and not around the rootball.

Tree Pits. DPR Forestry recommends 5-foot wide by 15-foot long tree pits in walkways and plazas to provide for a large rooting area.

Tree Grates. Tree Grates shall have expandable center openings and they must meet current ADA requirements. Concrete tree grates are not acceptable, however pavers or other pervious surfaces are allowed. See Public Works standards for tree grates within the ROW.

Tree Replacement. In order to comply with Game Plan standards of 15-18% tree canopy cover in residential areas and 10% cover in commercial areas, street tree replacement must take place. Infill trees should be planted to follow spacing and alignment of the original tree planting. DPR Forestry maintains a list of acceptable street trees, see Appendix D.

#### 3.4.6 Parking Lot Landscaping

See CCD Zoning Code for parking lot landscaping requirements.

#### 3.4.7 Landscape Maintenance

Executive Order No. 87 establishes the policy of the City and County of Denver as to Water Conservation. Therefore, DPR adheres to regulations set forth by the Denver Water Department regarding the use of water resources. For standard maintenance schedules see the Maintenance Chapter.

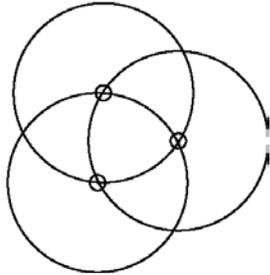


## 3.5 Irrigation

### 3.5.1 General Requirements

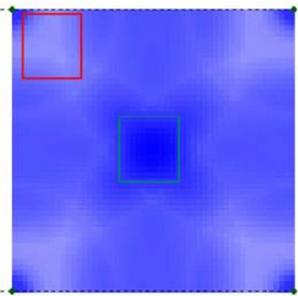
A properly designed and functioning irrigation system's benefits include

- Improved uniformity of irrigation water application
- Increased soil-moisture uniformity
- Lower water or power bills
- Easier irrigation system scheduling and management
- Reduced runoff and deeper percolation
- Healthier plants and turf grass that are most resistant to pests and disease



*Head-to-head coverage*

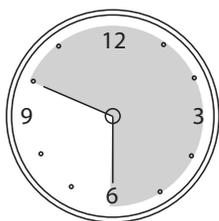
Equipment selection and the design of irrigation systems impact the uniformity of an irrigation system. This includes sprinkler types, nozzle size, pressure, pipe size, installation and system maintenance.



*Densogram: The red box indicates driest area and green box indicates wettest area*

Irrigation Design. The design of an irrigation system shall be based on hydrozones and shall be designed to efficiently apply uniform water throughout each zone during the allowable watering schedule. Irrigation systems shall be designed for head to head coverage. Refer to Table 3.5.1.1, Irrigation Design, for appropriate coverage in relation to the irrigation application. Verification of pressure shall be provided to the Project Manager. The irrigation design must also have sufficient residual pressure and flow to accommodate site conditions, field changes and unforeseen future demands as well as anticipated future demands, if it is a phased project. Water conservation equipment, such as rain/wind sensors and weather stations, should be used when appropriate.

Distribution Uniformity ( $DU_{LQ}$ ) and Scheduling Coefficients (SC) are two methods used to improve irrigation design and installation and help optimize the uniformity of coverage of irrigation systems. Densograms are used to demonstrate the theoretical sprinkler watering pattern based on specific sprinkler/nozzle/spacing/pressure combination utilizing DU and SC.



*Watering window*

Table 3.5.1.1 Irrigation Design		
Irrigation Application by Type of Zone	Distribution Uniformity (DU)	Scheduling Coefficient (SC)
Fixed Spray	65%	1.4 or less
General Rotor Zone	70%	1.3 or less
Athletic Field Rotor Zone	80%	1.2 or less
Drip/Micro	80%	1.2 or less
<p><b>Distribution Uniformity (<math>DU_{LQ}</math>):</b> A measure of how evenly water is applied across the lowest quarter of all catch cans set out in an irrigated area.</p> <p><b>Scheduling Coefficient (SC):</b> Defines how big the critical dry area will be and the irrigation run time required to alleviate the dry area</p>		

Watering Schedule. In order to comply with Denver Water watering requirements, it is critical that irrigation systems are designed to provide complete site coverage during the irrigation window. The standard watering schedule during non-drought years, wherever possible, should be 3 days per week with an 8- hour

irrigation window (10:00 pm to 6:00 am). While establishing plants (see Section 3.4 Landscape), and possibly during the vegetation protection period, the watering schedule is 2x the standard watering schedule. Irrigation systems should also take into account monthly irrigation watering budgets. Contact the District Superintendent for watering budget information.

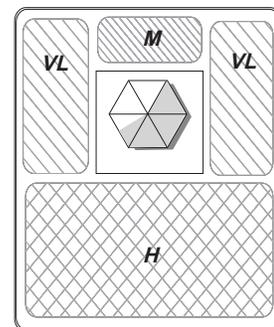
Table 3.5.1.2 Vegetation Watering Schedule				
Type of Vegetation	Season	Dates	Time	Frequency
Athletic field turf	Summer	March 1 - November 1	10p.m. - 6 a.m.	3 days/week
Turf	Summer	April 15 - October 15	10p.m. - 6 a.m.	3 days/week
Turf	Winter	November 1 - March 1	10 a.m. - 6 p.m.	As needed
Trees	Summer	April 15 - October 15	During establishment period (2-3 years)	Bi-monthly
Trees	Winter	November 1 - March 1	10 a.m. - 6 p.m. over 40°	Once a month
Natural Areas	Summer			

Hydrozones. In order to conserve and protect water resources, irrigation zones should take into account hydrozones. Hydrozones help to define the amount of water that should be applied to an area as well as the infiltration rate of the soil, soil type, slope, sun exposure and water needs of the plant materials and water pressure.

Table 3.5.1.3 Hydrozones		
Hydrozone	Inches per Year*	Example Vegetation**
Very Low (VL)	0"-7" per year	Succulent plants, desert grasses and shrubs
Low (L)	7"-15" per year	Prairie plants
Moderate (M)	15"-25" per year	Turf
High (H)	>25" per year	Sports fields, Golf courses

\* Year refers to one full irrigation season, see below.

\*\*Based on a site with little slope and typical soils.



*Example hydrozone map*

Maintenance. Executive Order No. 87 (see Appendix E) establishes the policy of the City and County of Denver as to Water Conservation. Therefore, DPR adheres to regulations set forth by the Denver Water Department regarding the use of water resources.

Warranty. See specifications for warranty information. Whenever possible, provide a two-year warranty for irrigation work.

### 3.5.2 Sources Of Water

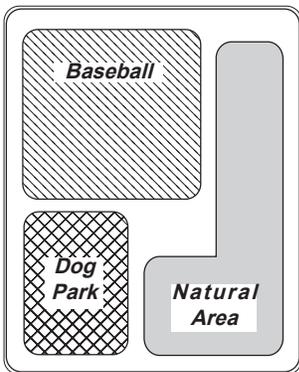
Consult Denver Water at concept level to analyze opportunities for using alternative water sources for designs. See specifications for acceptable products regarding the different sources of water.

Potable Water: Water fit for drinking; safe to consume. Water from any source which has been investigated by the health agency having jurisdiction, and which has been approved for human consumption. Drinking water is regulated through the state health department (Colorado Department of Public Health and Environment) and the U.S. Environmental Protection Agency.

Non-potable Water: Water such as treated domestic wastewater, groundwater and well water which is suitable for various beneficial uses excluding human consumption.

Recycled Water. Recycled water is wastewater treated to a higher standard suitable for applications other than drinking. It satisfies both U.S. Environmental Protection Agency regulations under the federal Clean Water Act and Colorado Department of Public Health and Environment guidelines for specific, non-potable uses. Recycled water is produced by taking treated wastewater effluent that otherwise would be discharged into a river or stream and treating it again to a higher standard so it can be used for non-drinking purposes such as irrigation for parks and golf courses, industrial uses, commercial applications, lakes and wildlife refuges.

Taps. Before any taps are made from mains, applications for the taps must be received and approved by Denver Water or other distributor. The potable water system shall be protected from contamination with recycled water through the physical separation of the two systems, which will be inspected by Denver Water.



*Isolate irrigation systems*

### 3.5.3 Isolated Systems

Whenever practical, specific program elements irrigation systems, such as ballfields, dog parks etc., or areas that require additional watering during the winter, can be located on separate systems. Consideration should be given for isolating trees on separate zones or systems to enable watering of trees during drought or when they are isolated in a low water hydrozone, such as a natural area.

### 3.5.4 Water Meter, Point Of Connection & Backflow Device

Water Meter. A water meter is a device used to measure the flow of water. Design the water meter to meet watering window requirements. Coordinate final location and install in conformance with Denver Water.

Point Of Connection (POC). The point of connection is the location where an irrigation system is connected to a water supply. The POC should be screened from view.

Backflow Device. A device installed between the point of connection and the sprinklers that is designed to prevent the backflow of contaminated water into the water source. A high hazard, reduced pressure type, USC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research) and Denver Water Board approved backflow device is required. A backflow cover is required. In high traffic areas, the backflow device shall be located on a concrete

---

pad and be protected by a bollard. See specifications for acceptable products.

### 3.5.5 Irrigation Heads

All heads of a specific type or function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification in such a position that they can be identified without being removed from the system. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated.

**Head Coverage.** Provide head to head coverage for all irrigated areas. Utilize the scheduling coefficient guidelines for each landscape type. Contractor will be held responsible for coordination between landscape and irrigation system installation. Landscape material locations shown on the Landscape Plan shall take precedence over the irrigation system equipment locations. Relocate the irrigation equipment if in conflict with the landscape material.

**Overspray.** All irrigation heads shall be installed and adjusted to avoid overspray onto buildings, walkways, play equipment, etc.

**Anti-drain Valve/Excess Flow Valve.** Consider using anti-drain valves/excess flow valves installed in the riser of the head assembly wherever possible.

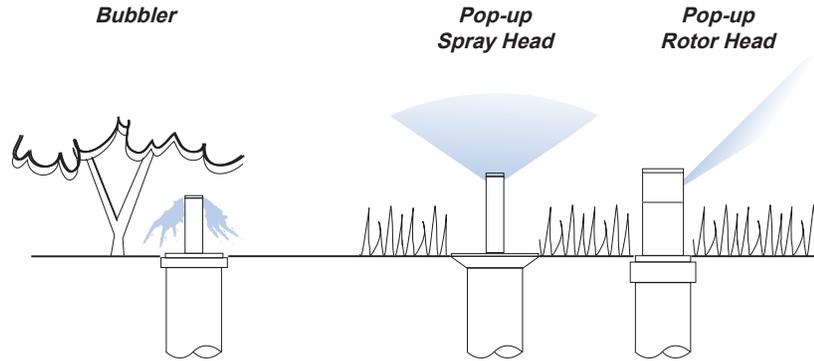
**Head Locations.** Landscaped areas less than 25 feet in width must be designed in accordance with the following Denver Water standards.

For strips of land less than 6 feet in width – Spray irrigation shall be prohibited. Low-flow irrigation systems are required.

For strips of land between 6 feet and 15 feet in width – Only low flow irrigation, or spray irrigation using low-angle spray nozzles designed for the specific width to be irrigated shall be permitted. All spray heads must be pressure reducing and designed to prevent low head drainage.

For strips of land more than 15 feet in width – Only gear-driven rotors with low angle nozzles may be used to irrigate turf areas. Planting beds may be irrigated with low-flow or spray irrigation. All spray heads must be pressure reducing and designed to prevent low head drainage.

Less Coverage  $\longrightarrow$  More Coverage

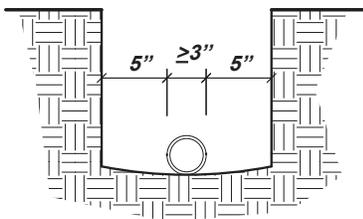


**Heads/bubblers**

Lawn, Shrub Or Groundcover Heads. Adjust heads to correct height after planting installation. Heads shall be flush to finish grade and shall be placed a minimum of 3" away from curb or hard edge for pop-ups and a minimum of 6" away from curb or hard edge for rotors. Plant placement shall not interfere with intended sprinkler head coverage, piping or other equipment. Heads of same type shall operate at the same pressure +/- 7%. In athletic fields, or other appropriate locations, a soft cover head shall be required. See specifications for acceptable products.

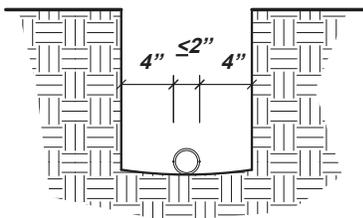
Subsurface / Low Pressure Irrigation. In non-irrigated areas, use subsurface/low volume irrigation to establish trees and shrubs. When using bubblers, locate them in small valve boxes to prevent damage.

**3.5.6 Irrigation Controls**



Irrigation systems shall be controlled by an automatic electrical controller. Utilize master valves and flow sensors where applicable. The controller shall be installed on a concrete pad at a location approved by the Project Manager, preferably in a central location to the covered area or system. The controller should be installed within a strong box. See specifications for minimum requirements and acceptable products.

**3.5.7 Installation (Trenching, Piping, Sleeving, Wiring)**



**Trench spacing**

Trenches. Trench excavation shall follow, as much as possible, the layout shown on the drawings. Dig trenches straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed. Comply with OSHA standards for all trenching and excavation. Trenching under canopy of existing trees should be accomplished by hand or other method that will not damage limbs or branches. Keep trenches at least 12 feet from trunk of existing trees. See tree protection detail for more information.

Trench horizontal clearances shall be 5 inches horizontally on both sides of the trench for piping 3 inches or larger, and for piping 2 inches and smaller, trenches shall have a minimum width of 4 inches of clearance.

Backfilling of trenches shall not begin unless authorized by Project Manager. Backfilling shall not be done in freezing weather unless authorized by Project Manager. Dress backfilled areas to original grade. Excavated material is generally considered satisfactory for backfill purposes. Backfill material shall be free of rubbish, vegetable matter, frozen materials, and stones larger than 1 inch in maximum dimension. Material not suitable for backfill or extra material must be hauled away. Do not leave trenches open for a period of more than 48 hours. Open excavations shall be protected in accordance with OSHA regulations.

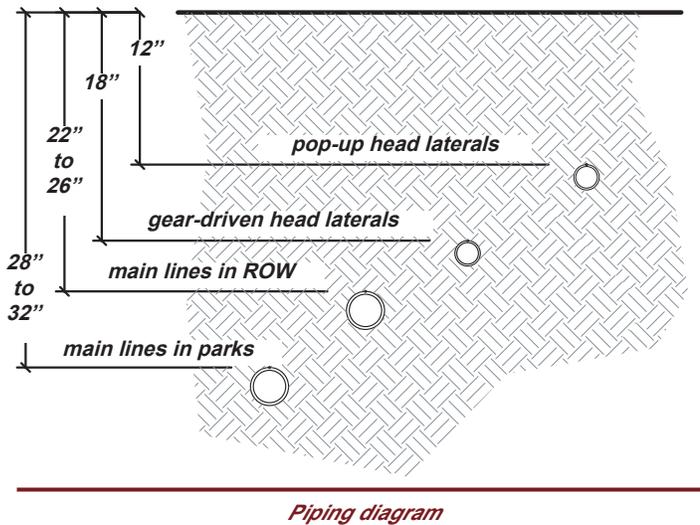
Piping. Provide a minimum of 6 inches of horizontal clearance between each line and a minimum of 12 inches of clearance between lines of other trades.

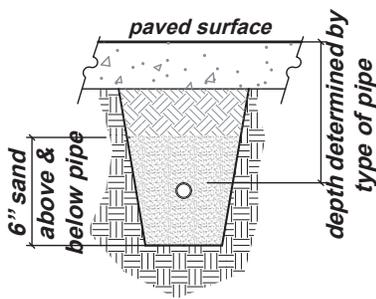
Table 3.5.7.1 Vertical Pipe Clearances		
Pipe	Location/Type	Vertical clearance from top of pipe to finish grade
Pressure supply piping (main lines)	in parks	28" min / 32" max
Pressure supply piping (main lines)	in ROW	22" min / 26" max
Non-pressure piping (laterals)	gear driven heads	18"
Non-pressure piping (laterals)	pop-up heads	12"



Pump station (Washington Park)

PVC Mainlines shall be installed with a minimum 3" per 100' slope to manual drain valve and drainage sump. Place manual drain valves at low points and dead ends of pressure supply piping to insure complete drainage of system. See specifications for acceptable products.





*Sleeving diagram*

Sleeving. Sleeving is required for all irrigation pipe and electrical lines below paving in order to minimize impacts to paved areas during construction/maintenance repairs. Install sleeving under asphalt paving and concrete walks prior to concreting and paving operations to accommodate piping and wiring and cover pipe ends. Extend sleeves a minimum of 12 inches beyond the paved surface above. Minimum depth to top of pipe shall be determined by depth of mainline and lateral lines. Lay sleeve to drain at minimum grade of 3" per 100'. Sleeving cannot be stacked vertically within the same trench. Sleeving located under areas where asphalt or concrete paving will be installed shall be bedded with sand (a 6" layer below pipe and above pipe). Mark sleeves in a manner to ensure easy location in the future by stamping the concrete and/or using tracer wires where appropriate. Sleeving is generally sized 2 sizes larger than the irrigation piping required. See specifications for acceptable products.

Wiring. Control wiring shall be installed on the side of pressure main when installed in the same trench. Control wiring vertical clearance is 24" from top of wire bundle to finish grade where installed separately from mainline trench. Wiring shall be color coded in accordance with specifications. See specifications for acceptable products.

### 3.5.8 Valves & Valve Boxes

See specifications for acceptable products.

Electric Control Valves. Control valves turn water on and off from individual circuits of sprinklers or drip emitters. Install electric control valves as detailed on the drawings. Cross-handle of fully opened valve cluster isolation angle valve shall be 3 inches below bottom of valve box lid.

Quick Coupling Valves. A permanently installed valve which allows direct access to the irrigation main for the use of hoses or mobile sprinklers. A key is required to open the valve. Install quick coupling valves as detailed at control valve cluster locations. At stand-alone applications, install on double swing joint in specified valve box.

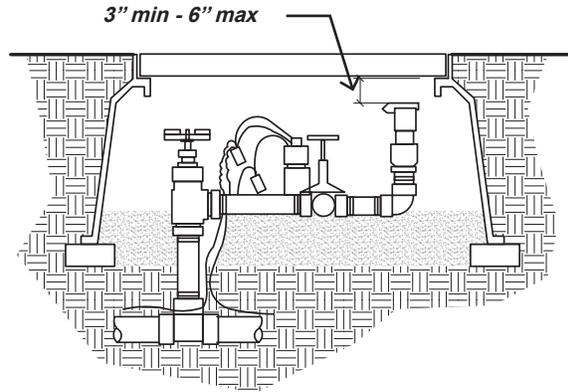
Drain Valves. A valve used to drain water from a line. Install manual drain valves at all low points in pressure supply line, whether indicated on the drawing or necessitated by actual conditions, to ensure proper drainage of the mainline. Install 6" PVC sleeve inside valve box for access. Provide a three cubic foot gravel drainage sump at each drain valve.

Isolation/Gate Valves. An isolation valve is used for isolating all or part of the irrigation system for repairs, maintenance, or winter shut-down. A gate valve is a type of isolation valve that is used as an emergency shut-off "gate" that blocks the flow of water; used infrequently due to the high tendency for wear.

Install as detailed in locations shown on drawings. Provide isolation valves along the mainline at appropriate locations to divide the irrigation system into controllable units, at stub outs for future systems, and prior to crossing expansive pavement.

**Air Release Valves.** Air release valves should be installed where mainlines dead-end, or are not on a continuous loop, and at high points on a continuous loop system.

**Valve Boxes.** A locked box that houses valves and is permanently labeled with zone numbers. Group valves to minimize the number of valve boxes. Install valve boxes flush with finish grade and square to adjacent surface features. When valve boxes are grouped together, allow at least 12 inches between exposed valve box sides. Cutting of valve box to give clearance for piping or valves will not be allowed. Valve boxes shall be colored green for potable systems and purple for non-potable systems. The top of valves in cluster boxes shall be a minimum of 3 inches and a maximum of 6 inches from the underside of the valve box lid, readily accessible and operational. Valve boxes should be located a minimum of 24 inches, with 36 inches as desirable, away from paved surfaces. No riser extensions shall be allowed to valve boxes. No boxes shall be located within Athletic Field play areas.



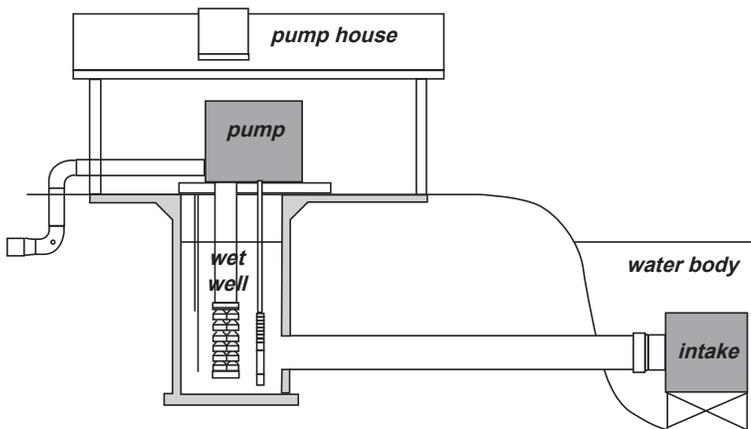
*Valve box diagram*

### 3.5.9 Thrust Blocks

Cast in place thrust blocks reinforce irrigation pipe at its joints where imbalanced hydraulic force exists (e.g. tees, bends, end caps, hydrants, valves, connecting pipe of differing materials, etc.). Construct thrust blocks in accordance with specifications. Contact Project Manager prior to placing thrust blocks, for observation of thrust block excavation and initial placement.

### 3.5.10 Pump Stations

Pump stations increase water pressure in order to move water. Consider visual impacts when siting pumps. In areas of high visibility, the pump station enclosure should be architecturally integrated into the park and surrounding neighborhood. Pump stations shall be accessible by service vehicles. Pump and booster stations shall utilize prefabricated variable frequency drive packaged vertical turbine pump systems. See the Facility Services Division for current pump station specifications and approval.



*Vertical Pump Diagram*

---

### 3.5.11 Water Conservation Devices

Irrigation Cycle Interrupters (Rain Sensors). Irrigation controllers shall be fitted with sensors that can terminate a watering cycle when precipitation or humidity would make irrigation unnecessary.

Weather Stations. Utilize evapotranspiration (ET) data from weather stations whenever applicable.

Water Management. Refer to the Water Management Conservation Plan and GreenCO BMP's for efficient water management techniques.



## 3.6 Structures

New structures must participate in the City of Denver Community Planning and Development (CPD) development review process if they comply with requirements for Planned Developments, Planned Building Groups, or Planned Unit Developments. These new structures must conform to the City of Denver's requirements. All DPR structures should be ADA compliant.

DPR places further restrictions on new structures over 5,000 square feet to attain the Silver level of the US Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) rating system. DPR also encourages sustainable features in structures under 5,000 square feet in order to "improve occupant well-being, environmental performance and economic returns of buildings" (LEED Rating System V2.1 p.i). Structures should incorporate sustainable characteristics in site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Architectural design should be of a high quality and utilize consistent forms so that they contribute to a city-wide Denver park identity. Incorporate quality details that are sensitive to historic character, as appropriate, while addressing contemporary issues of durability and economy. All permitted structures and facilities within a park should be clearly signed with a name and address in order to easily locate facilities and clearly dictate permitted structures.

Park structure standards were established by DPR to create a "family" of structures consistent in each park, and generally the intent is to create consistency among all parks. The following is a list of unified structures:

- Picnic Shelters
- Kiosks
- Toilet Enclosures
- Ballfield Dugout Cover & Pressbox
- Pavilions (special class, refer below)

See Appendix F for plans, elevations, sections and details. Approved furnishings for these structures can be found in Section 3.8 Furnishings.

Approved Color Palette. Structures within parks shall comply with the approved color palette unless otherwise authorized.

- Primary color: Federal Green - U.S. Govmt Paint Color No. 14056
- Accent color: Copperglow - Devoe No. 2D49C
- Lettering: White
- Black: Tricorn Black - Sherwin Williams No. SW212

***DPR Family of Structures (from L to R)***

- *Platte River Shelter*
- *Observatory Park Kiosk*
- *Cheesman Toilet Enclosure*



Pavilions. Pavilions are a special class of structure that require considerable care in siting, design and quality. Pavilions should add character to a park, and may draw upon historic themes in the community, in the park, or create a new character where appropriate. In new parks and even in some existing parks, pavilions could establish a thematic character. In this way they add richness and meaning to the park experience.

Pavilions are generally reserved for Denver’s major urban or regional parks. They should be located and sited to take advantage of meaningful locations within a park. For example, they could occupy the high ground such as the Cheesman Pavilion in Cheesman Park or anchor an important site at lake edge such as the Washington Park Boat House in Washington Park.

The design, location and setting of a pavilion should encourage permitted events such as weddings, graduations and rallies. One benefit and service is that pavilions can attract park revenue while providing an opportunity for hosting important events in a beautiful park.

### 3.6.1 Shelters

Design Criteria. DPR has three standard shelter sizes:

Table 3.6.1.1 Shelter Amenities				
Shelter	Size (sf)	Shape	Approx. Seating Capacity	Approx. Standing Capacity
Type A	617	Elongated Octagon	18	123
Type B	464	Elongated Octagon	12	92
Type C	900	Octagon	24-30	180

See Appendix F for detailed drawings. DPR accepts Polygon or Skylark models or approved equals. Note: Seating Capacity is based on recommended number of picnic tables. Standing capacity assumes 1 person equals 5 square feet.

Location Criteria. The siting of shelters is important because it can affect the ability to permit shelters. Permittable shelters should be located near parking, restrooms and play areas and shall be ADA accessible. Reasonable access to parking for delivery of food, tents, etc., shall be made.

Required Amenities. The following table illustrates the minimum amenities required for each shelter type. See Table 3.3.5.2 for parking guidelines.

Table 3.6.1.2 Shelter Amenities								
Shelter	Required Amenities				Suggested Amenities			
	Picnic Tables	BBQ's	Trash Rcptcl	Access to Quick Coupler	Lighting	Secured Electrical Outlet	Drinking Fountain	Bike Rack
Type A	3	1	2	1	Y	1	1	0
Type B	2	1	1	0	N	1	1	0
Type C	4-5	2	2	1	Y	2	1	1

### 3.6.2 Kiosks

**Design Criteria.** The DPR standard kiosk allows for two paneled sections, approximately 2'-6" wide by 3'-6" tall, attached to a roofed structure. Secure on a concrete pad. See Appendix F for detailed drawings.

**Location Criteria.** Kiosks should be located near entries, intersections of trails, where multiple signs and neighborhood postings are needed, and as determined by the Project Manager.



*Toilet Enclosure (Crescent Park)*

### 3.6.3 Toilet Enclosures

**Design Criteria.** The DPR standard toilet enclosure is a steel column structure with a corrugated steel roof and includes woven wire screen panels on the closed sides. See Appendix F for drawings however individual projects should update the drawings to include room for portable restrooms that meet ADA. See Section 3.6.6 Portable Restroom Facilities for more information.

**Location Criteria.** Toilet enclosures should be located where portable restrooms are a permanent condition and as dictated by the Project Manager.

### 3.6.4 Ballfield Dugout Cover & Pressbox

**Design Criteria.** See Appendix F for detailed drawings.

**Location Criteria.** Locate at DPR facilities where deemed necessary. Use only at Tier A Facilities (see Program Elements section for more information).



*Ballfield dugout cover and pressbox (Garland Park)*

### 3.6.5 Restroom Facilities

**Design Criteria.** The minimum restroom size shall be two toilets and one lavatory in a women's room and one toilet, one urinal and one lavatory in a men's room. However in cases of very intense use, such as ballfields, it will be necessary to add fixtures. When the number of people gathered at a particular site reaches 225, add one toilet in the women's and one urinal in the men's restroom. When the number grows to 300 add one more toilet in the women's and men's restrooms.

**Design restrooms to provide a service life of a minimum of 50 years when properly maintained. At a minimum, provide ADA compliant dimensions. Incorporate vandal and graffiti resistant design features.**

The following guidelines establish the demand criteria for a restroom facility.

- Where 150 or more people gather per day in a four to six hour period at a particular location at least three times per week during the summer months;
- Areas frequently permitted especially for families such as family picnics. As noted above this would apply to large families or multiple families and especially where shelters are available (at least three permits per week);
- Areas where permitted athletic events take place on a consistent basis, such as lighted ballfields;
- Locations where there is a dense congregation of uses, such as the grouping of picnic tables, playground and athletic fields (for example: Sloan's Lake North, Barnum Park South or Washington Park South Meadow);



- Areas where there is dense informal use (not permitted) that would demand water and restrooms facilities, such as a Skate Park;
- Key junctions at trails, paths, parkways and pedestrian bridges.

Location Criteria. Use best practice site analysis/design and integrate the restroom facility into the related park master plan or initiative. Locate the restroom in obvious areas of the park so that restroom can be easily found by park users and near roads for reasonable access by maintenance staff. Locate within sight and reasonable walking distance of the most intensely used areas; however, restroom facilities should be at least 50 feet away from playgrounds because children may put sand in the drinking fountains when playing. The restrooms should be visible from the areas of intense activity within the park, and where possible, visible from park entrances and the street for safety reasons.

Building Components. See the 2005 DPR Restroom Master Plan for building component recommendations.

Required Amenities. Provide a drinking fountain. Where needed, provide additional storage room for Maintenance and/or a minimum paved 8'-0" wide service road with a turnaround for ¾-ton maintenance vehicles.

### 3.6.6 Portable Restroom Facilities

The following applies to city provided portable restroom facilities only, not those associated with special events.

Design Criteria. Portable restrooms shall have a hardscape access for trucks. A minimum of one portable restroom should be accessible and such restrooms shall meet ADA guidelines for access. Follow other criteria as established in the Prototypical Restroom Guidelines.

Location Criteria. Portable restrooms should be located predominantly in community, regional and athletic/multi-use parks and meet the following criteria:

- Locations where permanent plumbed restrooms are planned but not yet built.
- Permitted areas frequently used by large groups of people, especially at shelters.
- Tier A and Tier B permitted fields during seasonal use or as needed.
- Non-permitted areas where there is frequent use of grouped park elements, such as an area that includes picnic tables, a playground and an informal play field.
- Key junctions on high traffic trails.

### 3.6.7 Concession Facilities

Design Criteria. Concession facilities vary from location to location and may range from a small sales kiosk to a large facility with food, beverage and retail sales. The following are examples of program elements that may be located in a DPR concession building: restrooms, kitchen (catering or full), offices, event room, cafeteria, retail area, vending machine area, etc.

Location Criteria. Concession buildings shall be located as needed. DPR Finance office involvement is required.

Required Amenities. Benches, bicycle racks, drinking fountains, trash receptacles, picnic tables, trash dumpsters and lighting are examples of other amenities that may be required at Concession facilities.

### 3.6.8 Maintenance Facilities & Work Stations

Maintenance facilities are necessary for every district. In addition to the District Facility, satellite maintenance facilities, or operation facilities, may be necessary for larger parks within a district.

Design Criteria-District Maintenance Facility (DMF). The average District Maintenance Facility is approximately 6,500 square feet and typically provides space for 40 staff (20 permanent and 20 seasonal). Table 3.6.8.1 is a list of minimum program elements for a DMF. See DPR Facilities for specific finishes and fixture requirements.

Location Criteria (DMF). DMF's shall be located by DPR.

Required Amenities (DMF). Possible additional amenities may include security, fencing, cameras, carports and alarms.

**Table 3.6.8.1 District Maintenance Facility**

Space	Size	Components
Multi-Purpose Room (lunch, meeting, training)	min. 750-900 sq ft	<ul style="list-style-type: none"> <li>• Sink and base cabinet</li> <li>• Personal lockers along a wall (15 minimum)</li> <li>• Space and service for refrigerator, hot plate and microwave</li> </ul>
Office Suite	min. 350 sq ft	<ul style="list-style-type: none"> <li>• Superintendent's Office (10' x 12', minimum): Space for computer, file cabinets, desks, two person conference</li> <li>• Operation Supervisor's Office: Space for desk, 2 computer work areas, map storage, small conference area</li> </ul>
Men's & Women's Restrooms		<ul style="list-style-type: none"> <li>• Located near Multi-Purpose Room</li> </ul>
Unisex Shower		<ul style="list-style-type: none"> <li>• Separate room</li> </ul>
Eye Wash Sink		<ul style="list-style-type: none"> <li>• In vehicle storage area</li> </ul>
Vehicle Storage/Work Area/ General Storage Bays	min. 2050 sq ft	<ul style="list-style-type: none"> <li>• 3-4 bays (16' x 40' each inside dimension) with Overhead doors one at 12' wide by 10' tall, others at 10' wide by 10' tall</li> <li>• Vehicles: Snow Plowing – 4 Vehicles, 2 deep (16' x 40'), Secured and sheltered miscellaneous vehicle storage in bay areas</li> <li>• Miscellaneous storage, secured within bay area (6' x 18' with shelves)</li> <li>• General work station: 1 or 2 with space for benches</li> <li>• Permanent staff equipment lockers, located in or near bay area: 15 minimum, approximate size 32" wide by 24" deep by 84" high</li> <li>• Slope bay floor to a drain that is connected to the sanitary sewer. A sand and grease trap interceptor is required</li> </ul>
Maintenance Technician Area	min. 160 sq ft	<ul style="list-style-type: none"> <li>• Includes irrigation and plumbing functions</li> <li>• Secured storage for special tools (80 square feet)</li> <li>• Separate secured storage for irrigation fittings, controllers, etc. (80 square feet)</li> </ul>
Horticulturist Area	min. 200 sq ft	<ul style="list-style-type: none"> <li>• Secured tool storage and special fertilizers (160 square feet)</li> <li>• Space for desk, file cabinet</li> </ul>
Secured and Sheltered Storage Area		<ul style="list-style-type: none"> <li>• Either attached or detached from main building</li> <li>• Tools: Gasoline powered tools, for example, power-push mowers, weed mowers, chain saws, etc. (8' by 16'), ventilation required; Agricultural chemicals- dry bags and boxes (6' by 16'); ventilation required; Miscellaneous- gasoline, lubricants, antifreeze; ventilation required</li> </ul>
Service Yard	min 16,000 sq ft, approx. 80' by 200'	<ul style="list-style-type: none"> <li>• Asphalt paving suggested</li> <li>• Staff parking – 10 spaces outside of fenced yard</li> <li>• Vehicle/equipment parking and storage</li> <li>• Lunch area, shaded with trees</li> <li>• Elevated loading ramp – optional</li> <li>• Irrigated landscape</li> <li>• Agricultural chemical mixing bay 13' by 18' (concrete slab with curb). One 4" drain is required to a 350-gallon storage/holding tank. The tank is buried with an accessible lid so that it can be evacuated. Note: Both chemical mixing bay and washing bay require permanently roofed shelter.</li> <li>• Vehicle washing bay, 13' by 18'. Concrete slab with curb and a 4" diameter drain to a sand grease trap required. Drain must be connected to sanitary sewer.</li> <li>• Three-sided shed for general storage optional, 28' deep by 96' wide</li> <li>• 6' fence with 25' wide sliding gate and one pedestrian gate</li> </ul>
Electrical Service		<ul style="list-style-type: none"> <li>• Verify demand at specific facility</li> </ul>
Hazardous Materials		<ul style="list-style-type: none"> <li>• No restricted chemicals are used or stored at DMF's.</li> </ul>

Design Criteria-Operations Facility (OF). The average OF is approximately 1,500 square feet and typically provides space for 4 to 6 permanent staff. An OF may require the following program elements: Lockers, men's/women's restrooms,

office, multi-purpose room, kitchenette, air compressor storage, trash dumpster enclosure, two-bay garage, garage floor drain, internet/technology lockable cabinet, fire/security system, mechanical closet, janitor's closet with water source, and a lockable horticulturist storage area. See DPR Facilities for specific finishes and fixture requirements.

Location Criteria (OF). An OF should be easily accessible and outdoor work areas screened from neighbors.

Required Amenities (OF). Provide parking for vehicles as needed.

Design Criteria-Work Station (WS). 8' by 10' lockable shed.

Location Criteria (WS). Work stations shall be located as needed, for example near ballfields for field equipment storage or in a park located a significant distance from the DMF. See Program Elements Section 3.7.3 Athletic Fields and Courts.

### 3.6.9 Recreation Centers

The 2006 DPR Indoor Recreation Centers Needs Assessment Findings and Analysis Compilation should be used to guide Recreation Center design. Within that document, The Analysis by Key Indoor Recreation Center System Components, makes recommendations on components and component sizes.



*Harvard Gulch Recreation Center*

### 3.6.10 Bus Shelters

Design Criteria. Bus shelters shall be provided by RTD. Bus shelter layout and amenities shall be reviewed by DPR when located on park land or parkways maintained by DPR. No advertising shall be located on shelters within DPR owned land.

Location Criteria. Bus shelters shall be located by RTD in cooperation with the Park Project Manager. Shelters shall be located near trail and/or park walkway access.

Required Amenities. A minimum of one bench and one trash receptacle secured to a concrete pad is required.



*Bus Shelter (Observatory Park)*

### 3.6.11 Amphitheaters

Design Criteria. Amphitheaters can be formally or informally designed, depending on the location, and consideration should be made for seating and stage sizing in relation to planned events. The amphitheater shall meet the guidelines established by the Americans with Disabilities Act.

Location Criteria. Amphitheater locations shall be determined by the Project Manager.

Required Amenities. Concessions, telephones, signs, parking, walkways, electrical connection, ramps and restroom facilities are amenities that may be needed for an amphitheater.



*Green Valley Ranch Amphitheater*

### 3.6.12 Historical Structures.

Design Criteria. DPR has a rich historical legacy within its park system. Care should be taken during the design and construction of structures and landscapes around historically significant areas. The Design Guidelines for Landmark Structures and Districts provides guidelines by which to evaluate the extent of preservation and alteration to assure that the significant characteristics of the Landmark structure or district remain apparent. The Secretary of the Interior's Standards for Archaeology and Historic Preservation shall also be utilized.

Required Amenities. Signage may be appropriate for providing information regarding historical structures within a park.

### 3.6.13 Park Ornamental Structures (Trellises/Pergolas/Arbors/Privacy Screening/Gateways/Arcades/Portals)

Park ornamental structures can serve a variety of purposes such as providing shade, especially in areas where trees are inappropriate (e.g. by pools), screening views, adding architectural interest, highlighting entries, creating visual links between separated areas, and providing framework and structure for landscape materials. These pieces can be freestanding or attached to a structure, fence or wall.

Design Criteria. Ornamental structures should be constructed of easily maintainable materials that have been approved by DPR Facilities. Ornamental structures should be compatible with other park architecture, in terms of style, color and material. Overall, structures shall be appropriately sized for the location and shall consist of elements that are sized proportionately to each other.

Location Criteria. Layout of park ornamental structures should be coordinated with utilities, grading and planting plans. Typically, ornamental structures should not be placed on top of utilities in the event of utility maintenance. Drainage should be directed away from barrier footings and posts and should not disturb drainage patterns unless necessary. Ornamental structures may reduce heavy winds and strong sunlight. However, shade patterns should be analyzed to prevent walkways and trails from being shaded during winter months when snow and ice may accumulate.

Required Amenities. Benches, drinking fountains, trash receptacles, picnic tables, fences, and lighting are examples of other amenities that may be needed for park ornamental structures.

### 3.6.14 Boat/Fishing/Dock Facilities

DPR Aquatics maintains rules and regulations regarding boat types and sizes at DPR parks. When designing boat/fishing facilities, consider areas, if necessary, for a boat launching ramp, boat slips and catwalks, docks, fishing stations and other necessary amenities.

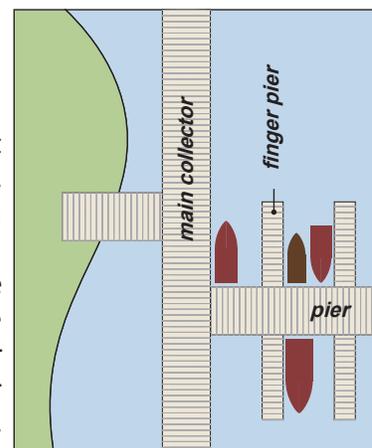
Design Criteria. Dock general circulation areas should be ADA accessible and should allow for the free movement of pedestrians when wheelchairs are perpendicular to the side railing. Floating docks are preferred when water fluctuates more than 18 inches. However, the benefits of closeness to the water level should be weighed against the fact that floating docks are often unstable, especially for those in wheelchairs. Consider using light colored materials for docks to reduce heat absorption on walking surfaces. Dock heights within



*Historic Cheesman Park Rustic Shelter*



*Centennial Gardens Trellis*



*Boat Dock Terminology*



*Small Dock (Washington Park)*



*Pedestrian Bridge (Sloan's Lake)*

18 inches to 24 inches of the water level allow easier access to boats. The minimum width of a dock should be 6' and finger walkways between slips may be a minimum of 3' wide.

Required Amenities. Parking, picnic shelters, concessions and site furnishings may be necessary.

### 3.6.15 Bridges

Design Criteria. The City of Denver requires the following CDOT Specifications be used for bridges that are to be maintained by Public Works: Bridge Section 628. Additional CDOT specifications, such as Bearings Section 512, Steel Structures Section 509, Pedestrian and Bikeway Railing Section 514, Timber Structures Section 508, Structural Concrete Section 601 and 602 may also be necessary.

Location Criteria. Bridges shall be located as deemed necessary by the Project Manager. Bridges located along ADA accessible walkways and trails shall be ADA accessible.

Required Amenities. Existing non-complying bridges should be signed.

### 3.6.16 Pavilions

Design Criteria. Pavilions should exemplify the highest quality of design for a particular park, built of high quality materials with maintenance and durability in mind that have been approved by DPR. Use care in locating trees and plant material so that these elements, when mature, do not visually overpower, hide or crowd the pavilion. The structure should provide shade and shelter from the elements and it should be sized to accommodate a minimum of 120 people. Even higher capacity is preferred. Provide lighting for safety and function as appropriate. Provide ADA accessibility. The current Denver Building Code applies and a building permit is required.

Location Criteria. A pavilion should occupy an important and meaningful location within a park as noted above. Refer to location criteria, 3.6.1 and 3.6.13 for "Shelters" and "Ornamental Structures" respectively as appropriate and follow BMP. Paved surfaces that can serve as vehicular access are important for delivery of event materials such as food or furnishing.

Required Amenities. The following items should be included within or around a pavilion: benches, trash receptacles, drinking fountains, bike racks, access to quick coupler, secured electrical power. Picnic tables within a pavilion are not appropriate. Refer to table 3.6.1.2, Shelter Amenities.



---

## 3.7 Program Elements

Program elements are the individual components that work together to create destinations for recreational use and enjoyment. These program elements work within an individual park but also combine to form a network of programming within the entire park system. This section discusses standards for individual program elements but does not make recommendations for how these program elements should be combined within a park due to the changing nature of recreation and demand by users.

### 3.7.1 Trails

The Parks and Recreation Department directs the construction and maintenance of nearly all the off-street trail system, coordinating with the appropriate City agencies. The off-street trails provide recreational opportunities and supplement the transportation emphasis of the grid bicycle route system. DPR trails are multipurpose trails serving a variety of trail users. DPR Rules and Regulations state that horseback riding shall be permitted only on paths or trails as designated by the Manager. Horseback riding is currently only permitted on the Highline Canal between Mississippi and Leetsdale and Cherry Creek. Standards for trails shall not apply to Mountain Parks.

Trails should conform to:

- CCD Bike Path Standards
- Americans with Disabilities Act (ADA)
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities. In some cases, CCD Bike Path Standards may override the AASHTO guidelines (which are typically requirements on federally funded projects).

Trail Hierarchy.

Regional Trails - essential routes in the citywide system, such as the Cherry Creek Trail, Platte River Trail, Bear Creek Trail, Highline Canal Trail, and Clear Creek Trail

Minor Trails - links to the regional routes, such as Lakewood/Dry Gulch, Sanderson Gulch, Goldsmith Gulch, Weir Gulch, West Harvard Gulch, and East Harvard Gulch

Neighborhood Trails - recreational loops or trails through a neighborhood, sometimes linking neighborhood destinations, such as Wagon Trail, Lake of Lakes Trail, and Westwood Trail

Trail Location Criteria. The criteria for placement of off-street trails includes undeveloped parcels, drainage corridors or open space, Parks Department ownership or maintenance responsibility, and connectivity to existing trails or public facilities such as schools, libraries and community centers.

Trails should try to avoid crossing users at grade on streets, and requiring frequent or diagonal crossings. When trail crossings occur at grade, they should occur at established intersections and where there is adequate sight distance. Where

---

future arterials and collectors cross existing drainageways, the design should provide adequate clearance for grade separation of trail users. When grade separation cannot be achieved, provide adequate medians to serve as a refuge for trail users.

**Trail Design.** There are optimal dimensions for safe operational conditions on shared-use paths. In areas of heavy pedestrian traffic, specific lanes should be designated for each of the uses. Such areas are designed for two-way travel, but must include a lane specifically for walkers, joggers, and other pedestrians. In the absence of available space for divided lanes, a single paved path is acceptable, provided that standard widths are used. The width for a two-directional shared-use path shall be 10 feet (8 feet minimum).

**Cross slope.** Paths shall be constructed with a 2% cross slope, which is the maximum allowed by ADA, with the pavement low point on the downhill side. This slope will help prevent ponding and ice formation on the path.

**Clear zone.** A clear zone of 3 feet (2 feet minimum) graded at a maximum of 6:1 shall be provided on each side of the trail. Within the 3-foot clear zone, a vertical clearance of 10 feet (8'-4" minimum) shall be maintained. The clear zone shall be flush with finish grade of the trail (maximum of 1" from finish grade of trail to finish grade of clear zone). Clear zones in Natural Areas should be crusher fines or seeded with short (<6") tall native grasses. These should not be mowed on a routine basis to discourage weeds and invasive vines.

**Recovery zone.** Paved shoulders shall be provided as zone of recovery for cyclists to regain their balance in areas where a maximum sideslope of 6:1 cannot be accommodated and particularly in areas where trail obstructions are present within the established clear zone of 3 feet (retaining walls, rocky slopes, waterways, etc.). This recovery zone shall be a 3 feet in width (2 feet minimum) and shall be finished with 3/8-inch tooled joints on 1-foot centers to provide a tactile warning to users that they have strayed off the path.

Where the trail is adjacent to canals, ditches or slopes down steeper than 3:1, a wider separation should be considered. A minimum 5-foot separation from the edge of the path pavement to the top of the slope is desirable. Depending on the height of embankment and condition at the bottom, a physical barrier, such as dense shrubbery, railing or chain link fence, may need to be provided.

**Design Speed.** The design speed for all geometrics shall be 20 mph (per AASHTO). If that cannot be accommodated, the revised speed limit that the design is based upon should be posted.

**Horizontal.** Minimum horizontal curvature along the centerline of the path shall be 90 feet. This minimum curvature applies where the cross slope of the path is 2% and the assumed lean angle of the bicyclist is 20 degrees. At trail intersections, access ramps, etc., the minimum inside radius is 20 feet to ensure maintenance vehicle accessibility (for sweeping and snow plowing). Pavement markings and signs shall be provided to alert users to any possible obstructions.

Stopping sight distance is an essential design element, particularly with maintenance vehicles operating on the trail. The safety of all users depends on the ability to respond to and avoid potential path obstructions. Per Figure 19 of AASHTO, the minimum stopping sight distance for a 20 mph design speed and 5% descending grade is 140 feet. The AASHTO guide can be used to determine the required lengths for other geometric conditions. It should be emphasized that the distances shown in the diagram are the distances required for one-way traffic only and are minimums. Every effort should be made to provide stopping sight distances greater than the distances recommended in the diagram. Table 4 of the AASHTO guide shall be used to determine the minimum lateral clearance required to maintain the appropriate stopping sight distance for trail obstructions. Intersections of off-street paths and all roadways shall be designed to comply with the recommendations set forth in the AASHTO guide and City & County of Denver standards.

**Vertical.** Steep grades can encourage quick descents and difficult climbs for an average user. Off-street paths in Denver must conform to the accessibility standards set forth by the ADA. Therefore, the absolute maximum longitudinal grade for off-street paths shall not exceed 5% for more than 800 feet in length. Maximum grades of 3% are preferable. Additionally, the effects of grade on erosion and drainage must be addressed. Attention should be given specifically to areas of rapid grade changes, where ponding may be a problem. The entrance/exit ramps for shared-use paths shall also comply with ADA standards. Ramps that exceed 5% in grade, up to a maximum 8.33%, shall provide 5' long rest plateaus every 30' horizontal travelled to allow users the opportunity to rest. Ramps shall be designed with a rest plateau at both the top and bottom of the ramp.

**Pavement & Surfacing.** The specifications for the pavement structure for multi-use paths is defined in the Typical sections, found in Appendix G. In general, the pavement shall be 6 inches in thickness and placed over a properly compacted subgrade. Pavement shall be concrete for all regional, shared-use paths. Other pavement types shall be approved by the DPR. The Highline Canal Trail is an exception to these pavement type standards, see Appendix G for more detail.

Surface finishes shall address two primary concerns: the maintenance and durability of the pavement, and the smoothness of the surface as it relates to comfort and safety of users. Cracks, vertical offsets and potholes create safety hazards for the users, and such surface imperfections also increase the possibility of damage due to freeze/thaw cycles. Cracks and vertical offsets can also catch the blade of a snow plow, damaging both the blade and the path surface. Control joints shall be perpendicular saw cuts of 1/8-inch width, one quarter depth of slab on 10-foot centers along the length of the path (control joint spacing is based on the width of the trail so an 8' trail would use an 8' spacing). Zip strips may be used instead of saw cuts. The surface of the pavement shall be a broom finish.



*Trail recovery zone (S. Platte River Trail)*

Recovery zones shall be tinted Davis Dye color 1117 (Tile Red) at a rate of three pounds per bag of Type I-II Portland Cement. Recovery zones shall be scored to 3/8" depth at 12" on centers. Fibrous reinforcement shall be included in the concrete mix.

Railings. Railings shall be used only in areas where there is great concern for safety. Railings shall be provided at any location where the adjacent drop-off is greater than 30 inches. Exceptions to this include drop-off's near streambeds and low water crossings. Areas with a drop-off of greater than 18 inches or sideslopes steeper than 1:1 should be considered for railings. It should also be noted that railings can be potential obstructions for cyclists. Railings shall be designed so that the vertical posts are set back from the actual railing. Also, railings should be placed near the edge of the clear zone when possible. If the railing is to be placed at the edge of the traveled way, a taper of 9 feet shall be provided to transition the railing from the edge of the clear zone to the edge of traveled way. Railings shall be a minimum of 42 inches in height. See Appendix G for railing detail.



*Railing (S. Platte River Trail)*

Drainage. Sideslope treatment shall be 6:1 maximum for 3 feet offset from the edge of the trail. In general, the high side of the typical cross section shall incorporate an interceptor ditch adjacent to the outside edge of the clear zone to divert the surface runoff before it reaches the path pavement. The interceptor ditch shall be a minimum of 1 foot deep. Landscaping or shoulder treatments shall be finished at 1 inch below the edge of pavement to help prevent ponding on the path. Drainage grates and covers should be placed outside of a shared-use path (and, when possible, outside of the clear zone). Also, the ends of cross-path drainage structures shall extend beyond the edge of the clear zone so as not to present trail obstructions. Use Carsonite markers, or approved equal, when obstructions occur within a clear zone.

Structures. The widths of structures (bridges, etc.) along the trails should maintain the widths of the trail segments they are connecting. Overpass structures must be a minimum of 10 feet in width. Although the design loads shall be project specific, the minimum design shall accommodate a 10,000-pound vehicle (H5 loading factor) to withstand loading from sweeping and snow plowing maintenance vehicles. In most conditions, bridge decks should be broom-finished concrete. Underpass structures shall provide 10 feet of vertical clearance (8'-4" minimum). If the determined height cannot be met, post signage that states the actual vertical clearance.

To route base flows of drainage and reduce the formation of algae and ice on the trail, 2-inch deep by 6-inch wide drainage gutter shall be provided at the low edge of the path through tunnel structures. Drainage gutters should drain at a minimum of 1% and should drain off of the trail to prevent ponding.

Intersections. Where feasible, grade-separated intersections shall be provided where trails cross arterial and collector streets. When an at-grade intersection must be designed, the following issues shall be considered:

- Traffic control devices, including regulatory, warning and guide signs shall be installed per the MUTCD (Manual on Uniform Traffic Control Devices) and per the recommendations of AASHTO.
- Stopping sight distance shall be provided per the previous discussion in Horizontal design section.
- Ramps, curb cuts, and refuge islands shall be provided per City accessibility standards and AASHTO recommendations.

- Paths adjacent to roadways shall be set back a minimum of 5 feet from the back of curb. If the 5-foot set back cannot be achieved, a barrier or railing shall be installed to protect users from vehicular traffic on roadways with speed limits exceeding 35 mph.

Lighting. Lighting for underpasses shall consist of 150-watt, high-pressure sodium vapor light fixtures with vandal-resistant lexan enclosures, plus a vandal resistant protective enclosure surrounding the fixture provided by Xcel. Lighting level shall be 2 footcandle minimum. To reduce glare while maximizing illumination on the trail and reducing vandalism possibilities, lighting fixtures shall be overhead-mounted wherever possible. Wallmounted lighting is also acceptable if clearance requirements cannot be met with overhead-mounted fixtures. Trail lighting should be determined by balancing issues of light intrusion, wildlife, and safety along a trail. When lighting is determined to be necessary, lighting levels shall be between 1 to 2 footcandles. See Furnishings-Lighting section for further lighting information.

Signing & Striping. All signing and pavement markings shall follow the specifications set forth by the MUTCD. A yellow centerline stripe shall be provided at all approaches to underpasses and continue through the underpass to separate opposing lanes of traffic. Yellow centerlines, used to define no-passing zones, should otherwise be used sparingly so that when used, trail users recognize that there truly is a trail alignment condition which requires that all users keep to their right. Pavement markings shall be non-slip in wet weather conditions.

Environmental/Conservation Issues. Off-street trails are often built along streamways and other environmentally sensitive corridors. A 50-foot buffer zone (10-foot minimum) should be maintained between an off-street trail and an adjacent sensitive conservation area. Also, trail designers should follow the guidelines described in the publication "Planning Trails with Wildlife in Mind - A Handbook for Trail Planners" (Trails and Wildlife Task Force, Colorado State Parks, and Hellmund Associates, September 1998). Where possible, native vegetation should be used to revegetate the site following construction of new trails.

Trail Furnishings. Furnishings along a trail shall not impede on trail circulation. Benches provide areas for resting along trails and are helpful on longer trails.

Non-MUTCD Signage. Cluster signage when appropriate.

Trailhead Signs. Trailhead signs should be located at the starting points of trails and at key intersections of major trail corridors. These should provide some or all of the following:

- Name of the trail
- Total distance
- Distance to points of interest
- Interpretive signage
- Rules and Regulations

Designated accessible trails should display the international symbol of accessibility. If the trail is not accessible, it should be signed "Not Accessible" at the trailhead.

---

Trail Markers. Trail markers should identify each trail along its entire route. Trail markers can also be located at set distances along a trail to give users an idea of how far they have traveled. The post signs should include one or more of the following:

- Trail logo identifying the particular trail
- Trail symbol indicating permitted trail use(s)
- Direction indicator
- Direction to major park destinations and trail intersections

Overlooks. Overlooks allow users to enjoy natural features and wildlife, or take in a unique view. Overlooks may include trailhead signage, trail markers, drinking fountains, benches, shade structures, trash receptacles, bicycle parking, etc.

Fitness/Wellness Stations. Equipment is developed to provide participants of all ages with a comprehensive physical conditioning program suited to different fitness levels. Generally, the first few exercise stations are designed to loosen muscles and warm up the cardiovascular system, intermediate stations for development of major muscle groups and flexibility, and final stations to help stretch muscles and cool down the cardiovascular system.

The stations are designed to be installed along a walking path in either equally spaced intervals or in clusters. The plan should be designed to accommodate a minimum 30 minutes of exercise. Layout of the equipment shall not impede on the walkway or trail.

Trailhead Design. Trailheads are the major access points to a trail. Trailhead design varies from simple facilities to encompassing spaces with multiple design elements. Meeting the needs of users should take into account the diversity of user groups along a trail. Trailheads can be divided into two categories of major and minor trailheads. Major trailheads include automobile parking and can be located at the beginning/end of a trail as well as points along the trail. Minor trailheads are located at intersections of two trails, resting points and at beginnings and ends of neighborhood trails, but may not include parking.

Major Trailheads may include the following:

- Convenient access to shuttle and/or transit stops
- Automobile parking, including parking spaces reserved for persons with disabilities (See Hardscapes-Parking Section)

- Secure bicycle parking (See Hardscapes-Parking Section)
- Kiosks, with orientation information, interpretive information and/or bulletin board space (See Structures-Kiosks Section)
- Trailhead signage
- Interpretive signage
- Drinking water
- Trash receptacles
- Benches, or other places to sit
- Restrooms or directions to restrooms
- Staging or gathering spaces (may include shelters and picnic tables)
- Lighting
- Telephone/emergency phones
- Equestrian amenities (horse trailer parking, water trough, hitching/mounting post) where appropriate.

Minor trailheads should provide a limited set of standard components, such as trail information, seating and bicycle parking. Drinking fountains and trash receptacles are also recommended if possible.

### 3.7.2 Playgrounds

Playgrounds shall be designed to offer the greatest play potential possible within the budgetary constraints and physical restrictions of the site. The play experience should challenge the users by addressing their physical, social and mental development while providing entertainment. The play environment shall be safe, durable, vandal resistant and require minimal maintenance. Playgrounds and equipment shall meet the current requirements of:

- Americans with Disabilities Act (ADA);
- Consumer Product Safety Commission's (CPSC) Handbook for Public Playground Safety;
- American Society for Testing and Materials' (ASTM)(F-1487) Standard Consumer Safety Performance Specification for Playground Equipment for Public Use (F-1292), Standard Specification for 15 Impact Attenuation of Surface Systems Under and Around Playground Equipment and Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment (F-1951);
- International Play Equipment Manufacturers Association (IPEMA).

Playground Design. Playgrounds shall be located within close proximity to picnic and turf play areas and should be designed with good sightlines in mind. Playgrounds should be located off secondary or tertiary walkways to prevent playground surfacing material transfer onto primary walkways and separate play areas from vehicular circulation. Play areas for preschool children (ages 2-5 years) shall be separated from play areas for school-age children (ages 5-12 years), if possible. Barbecues and plant materials with thorns or stickers, or that attract bees, or other potential hazards shall not be located adjacent to play areas. Provide seating close enough to play areas for adults to supervise children. Incorporate shade into the playground and seating where possible. Playgrounds shall be contained by curbs or adjacent walks. Due to fluctuations in surfacing materials (eg.. Engineered wood fiber), a ramp conforming to ADA standards

for disabled access shall be provided to play pits and should be designed to not impede on safety zones. Colors of proposed equipment and surfacing materials shall be reviewed by the Project Manager for heat absorption qualities. Avoid colors where surfaces get too hot to use in the summer.

**Playground Drainage.** The play area subgrade shall have positive drainage for all play area surfaces. Concrete sub-base for poured-in-place rubber surfacing shall slope at 1% minimum towards drain inlet or sump. Provide subsurface drainage where necessary. Leach lines or sumps may be considered if a storm drain is not available and is approved by the City Project Manager. If sumps are needed, design them outside of the play area, if possible, to minimize the amount of drainage rock that infiltrates the play area in the event children dig down and pull up the filter fabric, or repairs to the play equipment require digging.

**Playground Surfacing Materials.** Acceptable surfacing material includes engineered wood fiber or rubberized paving. Sand play areas should be used only as play features. Sand should not be used as the predominant playground surfacing. If both sand and engineered wood products are used in the same play area, then they shall be separated from each other by a minimum of 5' of paving or rubberized surfacing.

**Sand.** Sand shall be 4"-6" below the adjacent paving. See specifications for acceptable products.

**Engineered Wood Fiber (EWF).** Engineered wood fiber may be flush, or up to 4" below adjacent paving, after settlement. EWF shall be an energy absorbing protective surfacing manufactured for playground installations. It shall be non-toxic, free of bark and organic materials, independently tested by ASTM Standard F1292, with sufficient fines to comply with ADA requirements, while maintaining

**Head Impact Criteria (HIC).** Depth of playpit, shall be 12" plus 2"-4" of freeboard. EWF shall be 12" minimum compacted, and shall be of a thickness sufficient to attenuate falls per ASTM F1292.

**Interlocking Rubber Pavers.** Rubber pavers shall meet the requirements of CPSC and ASTM for play areas. Only pavers which have joints that will not trap sand or dirt in the process of expansion and contraction are allowed. Pavers may be placed on a concrete sub-base, and shall be of a thickness sufficient to attenuate falls per ASTM F1292.

**Poured-in-Place Rubberized Paving.** Rubberized paving shall meet the requirements of CPSC and ASTM for play areas. All rubberized paving shall be installed on a concrete sub-base. Refer to manufacturer's specification and installation procedures. Provide a 30-45 degree cant into adjacent sand play area which shall be keyed into concrete sub-base.

**Play Equipment Criteria.** All play equipment shall be installed in accordance with the manufacturer's specifications. All playground equipment, whether premanufactured or custom play elements, shall conform to the aforementioned playground standards. Follow the most current CPSC and ASTM guidelines for all safety zones.



*A play structure playground with bright colors (Crescent Park)*



*A play structure playground with a single color scheme (Sloan's Lake)*



*A play area that includes sculptures (S. Platte River)*



*A climbing area (Greenway Park)*



**Baseball Field at Lowry Sports Complex**

Playground Audit. A design and post-construction audit shall be conducted by a NRPA/NPSI Certified Playground Safety Inspector.

### 3.7.3 Athletic Fields & Courts

**Athletic Field Establishment Criteria.** The Athletic Field Master Plan (2005) indicates that sports played on a ballfield/diamond are experiencing a decline in player participation. However, sports played on multi-purpose/soccer/football turf fields are experiencing an increase in player participation. Based on this data, for future sport field/facility development, DPR should make multi-use fields a priority. For other siting/locating criteria, see the Athletic Field Master Plan (2005).

**Athletic Field & Court Layout.** Fields should be laid out based on the largest field size (soccer) in order to accommodate a variety of sports fields. All fields should be designed to have at least one alternate layout for seasonal field rotation.

A hierarchy of fields, based on level of service, is used within DPR. DPR encourages the development of predominantly Tier B fields within the city. The following are assumptions and criteria for Tier A and Tier B fields.

Table 3.7.3.1 Tier A Athletic Fields	
Tier A Baseball/Softball Field Criteria	Tier A Multi-Use Field Criteria
Regulation-size field for appropriate age group	Regulation-size field for appropriate age group (Multiple Field Sizes)
Multiple fields in one location	Multiple fields in one location
Field properly prepared for play (lines, dragged, etc)	Fields properly prepared for play (lined)
Skinned infield (Greater than 60')	Goals
Restrooms (functional - hard plumbed or sufficient number of portable restrooms )	Restrooms (functional - hard plumbed or sufficient number of portable restrooms )
Designated on-site parking	Designated on-site parking
Dugouts w/ play benches	North/South field orientation mandatory
Outfield fence	Crown in center for drainage
Scoreboard	
Grandstand/Bleachers	
Scoreboard/Press Box/PA Systems	
Tier A Maintenance	
Tier A Baseball/Softball Fields (Optional Amenities)	Tier A Multi-Use Field (Optional Amenities)
Warm up area, concession stand, field lights (also an extra fee), drinking fountains, covered dugouts (Argo, Garland, Lowry only)	Warm up area, bleachers, shade shelter, concession stand, drinking fountains, field lights (Also an extra fee)
<u>Turf Quality</u>	<u>Turf Quality</u>
Well-maintained Quality Turf / Synthetic Turf ( 2 & 3 Level)	Sports Turf / Synthetic Turf – (2 & 3 Level)

Table 3.7.3.2 Tier B Athletic Fields	
Tier B Baseball/Softball Field Criteria	Tier B Multi-use Turf Field Criteria
Regulation-size field for appropriate age group (or very near regulation size)	Regulation-size field for appropriate age group (or very near regulation size) (Multiple Field Sizes)
Multiple fields	
Field properly prepared for play (lines, dragged, etc.)	Multiple fields
Skinned infield (greater than 60')	Goals
Enclosed dugout w/ player bench	Field properly prepared for play (lined)
Outfield fence	Restrooms (portable restrooms at minimum)
Restrooms (portable restrooms at minimum)	Parking (on-site non-designated)
Bleachers	Crown in center for drainage if possible
Parking (on-site non-designated)	
Tier B maintenance	
Turf Condition	Turf Condition
Sports Turf (see Landscape section)	Sports Turf (see Landscape section)

Athletic Field & Court Design. Table 3.7.3.3 gives information regarding athletic field design. Signs shall be posted at all tier A and tier B level fields that state that use of this field is by permit only. Positive drainage needs to be achieved. Fields will typically be crowned in the center with drainage to the sides. There shall be positive drainage from home plate.

Table 3.7.3.3 Athletic Field & Court Design				
Sport	Space Reqmts	Size	Orientation	Max. Permit Hours/Year
<b>Ballfield Sports</b>				
Baseball	3-4 Ac	Baseline-90' Pitching dist-60.5' Foul line - 320' min.	Home plate/Pitchers Mound axis runs north/south	700
Softball	1.5 - 2 Ac	Baseline-60' Pitching distance- 46' men, 40' women Foul line - 275'	Home plate/Pitchers Mound axis runs north/south	700
<b>Multi-use Field Sports</b>				
Soccer	2 Ac	225' x 360' (20' min sideline clearance)	Long Axis N/S	500
Flag Football/Rugby/ Field Hockey	1.5 Ac	160' x 360' (10' min sideline clearance)	Long Axis NW/SE Long Axis N/S	500
Lacrosse	1.5 - 2 Ac	180' x 330' (20' min sideline clearance)	Long Axis NW/SE Long Axis N/S	500
Ultimate Frisbee	1 Ac	120' x 210' (10' min sideline clearance)	Long Axis NW/SE Long Axis N/S	500
Volleyball	0.1 Ac	30' x 60' (10' min sideline clearance)	Long Axis N/S	500
<b>Court Sports</b>				
Basketball (full court)	0.15 Ac	50' x 84' (5' min sideline clearance)	Long Axis N/S	NA
Tennis (2 court min.)	0.2 Ac	36' x 78' (10' min. sideline clearance and 21' end clearance)	Use California corners in design	NA

Parking Requirements. See Table 3.3.5.2 for athletic field parking recommendations.

Baseball/Softball Field Elements. Table 3.7.3.4 lists the model information for DPR accepted products. See Structures section for restroom and concession requirements.

Table 3.7.3.4 Baseball/Softball Elements			
Element	Description	Baseball	Softball
Backstops	Design to be tall and wide enough to limit foul balls hitting fans.	30' tall with hoods. 4 panels at 30' tall, dropping to 20' wings.	20' tall, 4 panels at 20' tall, dropping to 10' wings .
Fencing	Black chain link fabric and poles 6' high with outfield top rail caps (yellow). Foul poles optic yellow.	Black chain link fabric and poles. Dugouts should be covered and 30 ft long. ( seat 15 players). Optic yellow foul poles.	Black chain link fabric and poles. Dugouts should be covered and 30 ft long. ( seat 15 players). Optic yellow foul poles.
Scoreboards	Use on Tier A fields .	Fairplay radio controlled or approved equal.	Fairplay radio controlled or approved equal.
Bases/Base Anchors	Beacon Ballfields base anchors & Bolco home plates and pitching rubbers or approved equal.	Heavy duty 1-1/2" CH anchor teflon coated (chisel point). Home plates and pitching rubbers are Bolco "Bury all" or approved equal.	Heavy duty 1-1/2" CH anchor teflon coated (chisel point). Home plates and pitching rubbers are Bolco "Bury all" or approved equal.
Seating/ Bleachers	Seating varies.	A complex/tournament type facility should seat 100, and a game field should seat 60.	A complex/tournament type facility should seat 100, and a game field should seat 30.
Slope & Drainage	Field needs to be higher than surface outside fence. If not, concrete drain pans should be installed around entire infield fence line on the outside. Fields should not be placed at the bottom of large slopes.	Slope should be 1% from home to infield edge, then 2% from infield edge to outfield fence.	Slope should be 1% from home to infield edge, then 2% from infield edge to outfield fence.
Infield/ Outfield Materials	Infield mix should be "Sta-Lock" product from Hall-Irwin or approved equal. Tier A fields should use "Stabilizer".	Use 1-1/2" of "Stabilizer" on a good firm base. If "Sta-Lock" product is used, it will require 4" on good firm base.	Use of Stabilizer product will enhance surface playability, reduce maintenance, and practically eliminate rain outs.
Lighting	Lighting should be installed on all Tier A and "Complex" type fields. All future systems should be Musco brand or approved equal, and connected to the satellite/cell phone system.	Baseball fields due to Little League specs have a more stringent foot candle requirement than adult softball. See athletic field coordinator for specifications.	

Multi-use Field Elements. Table 3.7.3.5 lists the model information for DPR accepted products. See Structures section for restroom and concession requirements.

Table 3.7.3.5 Multi-use Field Elements	
Element	Description
Goals	All soccer goals shall be portable. Use “Scoremaster” or approved equal. Goal sizes will vary in respect to field dimension variance.
Surface	Surface should be level from endline to endline with a 15” crowned centerline.
Lining & Striping	Striping and lining will be done 2 ways: Lines are either cut in with a 8” mower blade, or painted in with white athletic field marking paint and a spray painter. When budget allows, Tier A fields are painted in.
Corner marks	Install corner marks for all possible field layouts.

Court Elements. Table 3.7.3.6 lists the model information for DPR accepted products. See Structures section for restroom and concession requirements.

Table 3.7.3.6 Court Elements	
Element	Description
<b>Tennis</b>	
Base	Post-tension concrete.
Surfacing	Athletic court surfacing with a cushion system. Acrylic color blue or green.
Net	Heavy duty vinyl-coated headband. 3.5mm braided polyethylene net body. 5/8” wooden dowels. 42’ length.
Posts	3.15” square box-section steel. Polyester powdercoated. Brass winder.
Lighting	8 lights per court.
Fencing	10’-tall vinyl coated, 8-gauge, black chain link fence. Includes top, middle and bottom horizontal bar. Include a full height maintenance access gate.
<b>Basketball</b>	
Base	Asphalt or concrete.
Hoops	Miracle Recreation Supply Model 360-110 special with double rim goal and nylon net, or approved equal.



*A tennis court with California corners (Washington Park)*

Lighting. Not all fields will need lighting. However, for fields that do need lighting, the general rule is as the level of competition increases, so do the lighting requirements. For Tier A fields and diamonds, the goal should be an even

distribution of 30 to 50 footcandles (fc). For all other fields and diamonds where it is determined that lighting is necessary, the goal should be an even distribution of 20 to 30 fc. Lighting designs should minimize light trespass, glare, and sky glow and consider maintenance when considering height of pole, type of lamps and style of fixtures. See court elements for court lighting requirements.

#### Alternative surfaces.

**Synthetic Turf.** Synthetic turf's main advantages are the greatly reduced water requirements and the reduced need for weekly maintenance and striping. It also provides an even and consistent playing surface that is not affected by the weather and can be used year-round.

#### Requirements for synthetic turf include:

- Adequate underdrain system with off-field drainage (connection to stormwater drain recommended).
- Line for soccer or line for only one other sport.
- Consider if synthetic turf is appropriate for the park setting. As a general rule it should be limited to athletic field complexes and playgrounds.
- Security fencing may be needed.
- Use proper edging (ex. concrete mow strip).
- Install a quick coupler system to allow for maintenance washing.

**Skinned Fields.** Like synthetic turf, skinned fields require low water use, however it is not as versatile as synthetic turf, as use during rain and snow can create an uneven and unsafe playing surface. The playing surface should be prepared similar to that of an infield of a baseball or softball field and crowned to drain. This may be a good temporary field solution in a phased project.



*Irrigation for multi-use fields (Lowry Sports Complex)*

**Irrigation.** Consideration should be given to developing a replacement and repair schedule for the irrigation systems for all the athletic fields. Without adequate water, fields will go dormant and with continued use turf damage will occur to the fields. Over-watering can also be detrimental to athletic fields. If irrigation systems are leaking or if the schedule controller is set up for the watering of the entire park, the athletic fields may be getting over-watered or water may be applied too close to a scheduled usage of the field.

#### Additional requirements for athletic field irrigation (see Irrigation section for basic irrigation standards):

- Use heated and insulated backflow preventer enclosures to enable watering during the athletic field season and not the irrigation season.
- Separate athletic field zones from other park zones.
- Locate irrigation valve boxes outside of playing fields, including alternate layouts.
- Use controllers that allow for multiple program settings.
- Irrigation systems shall take into account the Denver Water watering window and DPR use restrictions.
- A booster pump is recommended in order to allow multiple irrigation schedules to be run at the same time due to competing field irrigation and field scheduling issues.

### 3.7.4 Dog Parks

Based on research done for the Denver Department of Parks and Recreation's Dog Off-leash Pilot Program, a set of Site and Design Criteria were developed for any proposed off-leash area within the DPR system. The criteria define the basis for a safe, functional off-leash area and its relationship to the surrounding uses and environment. The criteria accommodate a range of possibilities for off-leash areas from single use (fully fenced) to shared use sites (partially fenced, time of day restrictions). Key elements for new locations are walking distance from neighborhoods as well as equitable distribution city-wide. Having identified community involvement as a key factor in the success of an off-leash area, any new areas will have to be supported by the local community. To create and ensure this support a process is set up by which a community can apply for a future dog off-leash area (Appendix H).



*Fuller Dog Park*

#### Site Criteria.

- No Designated Natural Areas or wildlife habitat
- No natural bodies of water
- No toxic residue from previous uses
- Positive drainage
- Clear separation from other park uses/amenities such as picnic areas, athletic fields, or regional trails, either via a fence, vegetation, distance or time of use
- Distance of 100 feet from a playground or other children's facility
- No arterial streets within 200 ft. unless the area is fully fenced
- Access to parking
- Good connection to adjacent/surrounding neighborhoods via pedestrian/ bicycle trails
- No other site within same service area (2-mile radius)

#### Design Criteria

- Minimum size of one acre
- Nonlinear layout to maximize usable space
- If fence needed, use a 4-foot tall decorative perimeter fence with minimum 2 double gated entrances plus two 10-foot wide maintenance gates
- ADA accessible paved entrance path
- Crusher fines surfacing around entrance at least 30'x30'
- Minimum of 1 acre of alternative surface (sand-based soil mix, synth. turf.) – balance of area can be native vegetation; no turf
- Minimum of 4 doggie clean up stations (bag dispenser & trash barrels)
- Community bulletin board
- Shade trees or shade structure
- Attractive visual buffer from surrounding residents and/or park areas (vegetation, fence treatment)
- Rules & Regulation signage

#### Optional amenities

- Shade structure
- Water
- Benches/tables

### 3.7.5 Skateparks



*A large regional skatepark (Denver Skatepark)*



*A small skills skatepark (Greenway Park)*

A “Skatepark” is any facility, structure, or area, whether integrated into the design of a city park or built as a stand alone facility, which is meant to be used by skateboarders, inline skaters, roller skaters or bicycles without pegs. A skatepark is comprised of both an activities area and a spectator area. Skatepark size and components, such as bowls, street areas, and movable equipment, may vary based on demand. A skatepark should be accessible to the public and should connect to park circulation by means of a hard surface walkway.

#### Skatepark Design.

**Activities area.** That portion of a skate facility reserved or designed for riding skateboards, in-line skates, roller skates, or bicycles without pegs.

**Spectator area.** That portion of a skate facility reserved for use by persons viewing the skate activities area. At a minimum, the spectator area shall include all areas that are 30 feet or less from the outer edge of the skate activities area.

A warning strip, or rumble strip, is recommended at the walkway connection to a skatepark to warn users to slow down as they exit the skatepark. Surfaces within the skatepark should be designed to be smooth and continuous. The skating surface should not be compromised by adjacent materials. Crusher fines and mulch near activity areas is strongly discouraged. Color concrete may be necessary to improve aesthetics, reduce sun glare, and increase safety by visually showing transitions from different activity area components (e.g., transitions from bowls to flatwork). Consider buffering and transitioning adjacent to the skatepark area and within the park with resilient landscaping and site design.

The skatepark shall be designed to be maintainable and discourage standing water. Irrigation shall not overspray into the skatepark.

**Skatepark Amenities.** Rules and regulations shall be posted at all skateparks. The following is a list of amenities that should be considered when designing a skatepark: benches, drinking fountains, restrooms, lighting, trash receptacles, shade structure, bicycle racks, secured power outlets, quick coupler access, and a concession zone for portable concessions. Due to the intense usage of skatepark facilities, these amenities should be graffiti-proof, vandal-proof and skate-proof to the greatest extent possible, even when located outside the activities area. Locate secured power outlets to prevent vandalism, such as elevating beyond a person’s reach.

### 3.7.6 Disc Golf

In general, a disc golf course should only be located where it will not be in conflict with other existing uses. Disc golf courses should not be located close to trails, picnic tables, etc., where errant discs could injure other users. Also, the course should minimize the risk of shots going into the street, parking lots, etc.

Wherever possible, the course should consist of 18 holes, although 9 holes may be provided where space is a constraint. Generally, 6 to 10 acres will be required for a recreational 18-hole course on level ground. Up to 30 acres will be required on hilly terrain or for championship courses.

**Disc Golf Design.** Where possible, the course should have lots of variety, with a mix of short and long holes, open and tight, left and right around tree masses, etc. Where it is necessary for a disc golf fairway to cross a trail, the course should be designed so the disc golf player has excellent site distance in both directions on the trail and can see oncoming trail users. Disc golf etiquette gives trail users the right of way.

Individual fairways within the course should never cross each other. The course should be designed so that the last target is close to the first tee, preferably near a parking lot and restroom facilities. If possible, the course should be one way on the front nine (clockwise) and the opposite direction on the back nine.

Tees should be concrete, minimum 6 feet wide and 12 feet long, oriented in the direction of the hole. The concrete should have a rough broom finish lengthwise on the tee. If possible, provide multiple tees (e.g. advanced, recreational, beginner) for a wider range of abilities. Hole information and number should be given at each tee. In general, provide 3 sleeves for every hole so that the targets can be regularly moved around. This will provide more variety for the players and will minimize the wear and tear on the turf near the targets.

**Disc Golf Amenities.** Rules and regulations, as well as signage for holes, shall be posted at disc golf courses. The following is a list of amenities that should be considered when designing a disc golf course: benches, restrooms, drinking fountains, trash receptacles, parking facilities including bicycle racks.

## 3.8 Furnishings

**General Requirements.** Parks shall include site furnishings as necessary. Site furnishings accepted by DPR are designed to complement each other in color, materials and form and have been tested for durability and maintenance. Specialty site furnishings may be appropriate in some cases; however, furnishings should be reviewed with the same criteria as approved furnishings. Site furniture shall be permanently secured per manufacturer's recommendations. Site furnishings shall be oriented to discourage skateboard activity to the greatest extent possible. All furnishings shall be Federal Green color unless otherwise stated.

**Locations.** Site furniture in lawn areas shall be spaced a minimum of 15' from other site furniture, fencing/walls, and trees/shrubs to accommodate City lawn mowers. Site furniture shall be located to avoid conflicts with irrigation systems, other park improvements, wildlife activity, and will be located in areas that will be the least damaging to native plant communities.

### 3.8.1 Picnic Tables



*Picnic table on concrete pad*

**Location.** Picnic tables should be located where there is some shade, and somewhat close to parking and access points. Picnic tables shall be placed on concrete pads with a 2% cross slope for drainage. Pads shall extend 4' beyond the table/bench dimensions to accommodate circulation and maintenance. Some of the picnic tables should be contiguous to walkways or have walkways leading to them for disabled access. Table 3.8.1.1 lists suggested guidelines for the number of accessible seats at picnic areas. See Structures Standards 3.6.1 for picnic table requirements at shelters.

Table 3.8.1.1 Guidelines for Accessible Seats at Picnic Tables	
Capacity of Seating	Number of Wheelchair Seats
4 to 25	1
26 to 50	2
51 to 300	4

**Model.** DPR accepts the Little Tikes #266-6-07 single pedestal, direct bury, powder coated picnic tables or approved equal.

### 3.8.2 Park Benches



*Denver Ribbon Bench*

**Location.** The Denver Ribbon Bench is used in all park areas to help visually define DPR-owned property for the public. Park benches shall be placed on a concrete pad when located in lawn areas and should not impede circulation. Park benches along primary walkways should provide an area for accessible seating. Benches may be backless if necessary. Benches should be designed with a middle armrest. In Natural Areas benches should be located in strategic sites for wildlife viewing, but away from wildlife activity and nesting.

Memorial benches can be purchased through DPR. The cost for a memorial bench includes the bench, pad and commemorative plaque and the process takes approximately 12 weeks. Coordination of bench location is made with the donor, Project Manager/Superintendent and the Park Bench Donation Coordinator.

Model. DPR accepts Victor Stanley, TimberForms, BRP and Wausau Tile, Inc. #MF 2200 ribbon style, 6', surface mount, powder coated benches or approved equal.

Exception for Natural Areas: DPR accepts any of the specified Denver Ribbon Benches or approved equal in the color of brown for all of the natural areas in the system. For fenced, larger natural areas (e.g. Heron Pond), DPR also accepts the 6' DuMor Bench 165-60PL recycled plastic with cast iron supports in Heritage brown or black or approved equal. Benches may be backless if necessary.



*Backless Denver Ribbon Bench*

### 3.8.3 Drinking Fountains

Location. Every park, pocket parks optional, should include at least one drinking fountain when utility access allows. Drinking fountains are operated from April 15 to October 15, depending on weather conditions. Locate drinking fountains a minimum of 50 feet from playgrounds to prevent transfer of sand/woodchips into the drinking fountain. Use High/Low drinking fountain for disabled access when appropriate. See Structures Standards 3.6.1 for drinking fountain requirements at shelters.

Model. DPR accepts Haws 3500 series or approved equal.

### 3.8.4 Barbecues

Location. Black metal barbecues shall be located outside the circulation routes. If located in lawn areas, provide a concrete pad as a mow strip. There shall be no barbecues in Natural Areas due to potential fires, but barbecues are allowed in managed parks/areas adjacent to Natural Areas. See Structures Standards 3.6.1 for barbecue requirements at shelters.



*Inverted U bicycle racks*

Model. DPR accepts Little Tikes #200X single pedestal, rotating grill, powder coated barbecue or approved equal.

### 3.8.5 Bicycle Racks

Location. See parking for bicycle rack requirements. Bicycle racks shall be secured. See Structures Standards 3.6.1 for bicycle rack requirements at shelters.

Model. DPR accepts Wausau Tile, Inc. #MF 9006 inverted U surface mount, powder coated bicycle rack or approved equal.

### 3.8.6 Trash Receptacles

Location. Trash receptacles shall be located in easily accessible areas for ease of pickup. See Structures Standards for trash receptacle requirements at shelters. Trash receptacles located near benches should be spaced a minimum of 10 feet away from a bench. Coordinate with the Project Manager to determine the number of receptacles needed within the park and at specific program elements. See Structures Standards 3.6.1 for trash receptacle requirements at shelters.



*Ribbon Trash Receptacle*

Model. The Denver Ribbon trash receptacle is designed to complement the Denver Ribbon bench. Trash receptacles shall have a side opening to allow for easy removal of the trash liner. Trash receptacles should have a protective hood cover if possible. All receptacles in Natural Areas shall have hood covers. DPR accepts Wausau Tile, Inc. #MF 3202 side door open ribbon style, surface mount, powder coated trash receptacle or approved equal.



*A dumpster is screened from the park view (above) but accessible from the park road (below)*



### 3.8.7 Trash Dumpsters

Location. Screen from view to the greatest extent possible.

Model. Side-loading dumpsters are the standard within DPR; however, rear-loading dumpsters can be accommodated when necessary. The dumpster size should be a minimum of 2 yards.

### 3.8.8 Fences

Parks should be designed functionally and visually as open as possible with as little fencing as possible. Fencing should only be provided for multipurpose fields or where there is a safety issue that cannot be addressed by some other means.

Chain-Link Fencing. Use 9-gauge 2" galvanized (after weaving) chain link wire. Use 11-gauge 1-3/4" galvanized (after weaving) chain link wire for tennis courts. All tube, posts, top rail, and bracing is SS40 or schedule 40. Vary in height and detailing as per the specific site use(s) and requirements. If the fence exceeds 8' in height a mid-rail will be required. Specify a top and bottom rail for all chain link fences.

All materials shall be free of burrs and sharp edges, and salvage shall be knuckled. Fence posts, chain link, rails and all hardware to be coated when possible. Chain link fabric shall be located on the side adjacent to play or use areas and attached with plastic ties.

Decorative Fencing/Outdoor Pool Fencing. Fabricate using 1 inch square steel tube welded to 1 inch square tube cross pieces which are then welded to the 2 inch steel square tube uprights.

Post and Cable Fencing. Post and cable fencing shall not be used within park land.

Natural Area Post & Rail Fencing. Perimeter fencing intended to mark the edge of a natural area, discourage pedestrians and bicyclists, and keep out

---

motorized vehicles and automobiles shall be a simple post and (2 or 3) rail system. Rails should be secured in their holes.

Natural Area Woven Wire Fencing. Perimeter fencing intended to keep pedestrians and wildlife off of adjacent roads shall be a post and woven field wire system. Cable shall run along the top and a tension wire along the bottom to keep the fencing square and secure. Fencing will be square (or rectangular) with the smallest openings a minimum of 3" and a minimum 9 ½ gauge, galvanized (after weaving) or black wire. The cable and tension wire shall be independently secured at points so that no cable section is longer than 80' (to prevent breakage along the length of the entire fencing).

Natural Area Prairie Dog Fencing. Prairie dog fencing shall be a solid vinyl or metal fencing, buried to a depth approved by the City Naturalist and exposed until vegetative barriers are established.

### 3.8.9 Fence Gates

Gate openings for pedestrians shall be a minimum of 4' wide. Gate openings for maintenance vehicles shall be a minimum of 14' wide. Fence gate locations should consider utility access and locking for emergencies. See DPR Facilities for vehicle gate design and manufacturing.

### 3.8.10 Walls

Shall be designed and located to discourage skateboarding and graffiti vandalism. Walls shall not be located within the ROW.

Wall Railing. Safety railings shall be provided when walls are over 30" in height and adjacent to walkways, as necessary.

### 3.8.11 Signage

Table 3.8.11.1 relates information regarding the various types of park signage. See Appendix I for detailed drawings and acceptable signage materials. The variety of sign types comprise a kit of parts which are to be used to meet the typical signage needs of Parks and Recreation facilities. Natural Areas sign types are designed to correlate to the DPR facilities signage, but also stand out as individual to Natural Areas. Certainly all instances and conditions are not accommodated by these standard sign types. In the event that an atypical situation arises, the signage must be submitted for approval. This is an effort to maintain the consistency and clarity in graphic communication. In addition, request for special trails signage, both permanent and temporary, must be submitted to the Trails Coordinator for approval. Consideration should be given for alternate formats and languages for educational and regulatory signage.

DPR has formally adopted policies and procedures governing how the department decides whether to accept and how to recognize potential gifts, corporate sponsorships, and naming requests associated with capital projects. Advertising is illegal in Denver parks, parkways, trails, and recreation facilities. Depending upon the scale and type of request, approvals, in addition to that of the Managers, may be required from the Parks and Recreation Advisory Board, the Office of

Cultural Affairs (for fine art), or from City Council. Please see Appendix J.

**Special Needs Signs.** While those signs which fall under the Americans with Disabilities Act have been designed with the rule in mind, special considerations should be given to sign content, location and selection in order to provide the greatest access possible to persons with disabilities.

**Temporary Signs.** “Manual on Uniform Traffic Control Devices” (MUTCD) guidelines shall be used for detour signage when detours are to be implemented. Temporary project identification signs, used to identify project name and group responsible for the work (e.g. flower planting, clean-up, etc.), should be mounted freestanding adjacent to short-term projects. Set these signs back from the trail or roadway far enough to avoid interferences with pedestrians and/or vehicles.



*A large park ID sign*

**Existing Signs.** A number of existing monument signs, particularly in the Mountain Parks, have been recognized as significant, in terms of character and historic value. It is the intent of this standard to supplement such signs, not to replace them. These signs possess a character and historic significance that should be maintained. DPR planners should determine those signs which warrant this type of consideration and may choose to supplement such signs with an additional sign from this package or replace an old logo with a new one to update the sign. The sign types from this package may be used in conjunction with existing monuments to meet additional needs.



*Educational Interpretive Signage (S. Platte River)*

**Sign Proximity to Features.** In locating signs relative to other features (such as buildings, roads, amenities, facilities), be certain the proximity of the sign to the feature is such that their relationship is obvious and appropriate. Signage should not interfere with the integrity of historic structures and should be located adjacent to the structure. Refer to MUTCD guidelines and 3.4.5 Street Tree Layout Standards when locating signage within the ROW and determining signage height.

**Footings.** All sign posts shall be installed centered in concrete footings. All exposed edges of concrete footings shall be eased to finish edges and minimize breakage. The top of the footing shall be flush with finish grade. Signs shall be ordered from the DPR approved signage fabricator. If not, the alternative fabricator shall submit shop drawings of each typical footing detail, designed and stamped by a licensed, professional engineer for all Park ID, Educational and pole-mounted Regulatory signage.

**Table 3.8.11.1 Signage**

Type	Qty	Sign	Description	Location
Park ID		Large Park ID	Used to identify larger parks and recreation facilities, where there are longer sightlines and faster moving traffic. Natural Area Park ID signs shall be used to identify large, "free-standing" designated natural areas (e.g. Camp Rollandet, Heron Pond).	Mount freestanding near roadways and/or sidewalks. Observe required setbacks from public streets and property lines. Regional and Community parks should have signs at appropriate major entrances or highly visible locations. Neighborhood parks, or smaller, should have one park ID sign per park. Greenways/Trails should locate one park ID sign per trailhead.
		Small Park ID	Used to identify smaller parks and recreation facilities, with shorter sightlines and slower moving traffic.	
Building ID		Large Building ID	Used to identify larger parks and recreation buildings, where longer sightlines, faster moving traffic and the scale of the architecture dictate a large sign. Observe local sign code restrictions.	Mount on building near entry door.
		Small Building ID	Used to identify smaller parks and recreation buildings, where shorter sightlines, slower moving traffic and the scale of the architecture dictate a small sign. Observe local sign code restrictions.	Mount on building near entry door.
		Structure ID	Use to identify name and/or address of structure for permitting and emergency purposes.	Mount on structures (shelters, restrooms, etc.) in a location that is readable from roads/parking areas.
		Interior Building Signage	Use large size to accommodate longer legends and/or longer sightlines. Use small size to accommodate shorter legends and/or shorter sightlines. Do not mount directly to door, as this is a violation of the Federal Americans with Disabilities act (ADA). According to ADA, signs identifying permanent rooms (interior or exterior) must conform with certain criteria, refer to the ADA document for details.	Mount adjacent to doors or entry openings to permanent rooms or spaces (restrooms, locker room, etc.). This signage is appropriate for buildings of a similar nature (Recreation, Pool, and Maintenance Facilities).
Educational		Interpretive Notice	These are pedestrian scale signs and should be positioned so as to be accessible by the non-vehicular public in proximity to the item they refer to without interfering with the item. See that these signs are accessible by persons with disabilities. Utilize graffiti-resistant, vandal resistant, and fade resistant materials for signage.	Mount freestanding on park land adjacent to points of interest (historic, natural, general, etc.).  Naturalized areas within traditional parks (e.g. sections in parks like Bible Park or Chennai).
Regulatory		Double Pole Notice	DPR Rules & Regulations (R&R), Natural Areas R&R, or other program elements R&R (skatepark, permitted fields, fountains, tennis courts, pools, etc.)	Mount freestanding adjacent to parks and park elements. Use where wall mounted signs are impossible or inappropriate.
		Notice wall mounted	DPR Rules & Regulations (R&R), Natural Areas R&R, or other program elements R&R (skatepark, permitted fields, fountains, tennis courts, pools, etc.)	Mount to wall adjacent to parks and park elements. Use where pole mounted signs are impossible or inappropriate.
Traffic Control/ Directional		Traffic Control/ Warning pole mounted	Used for traffic control and warning information (e.g. Yield, Stop, etc.). All such signs shall conform to the standards described in the "Manual on Uniform Traffic Control Devices" (MUTCD). When a sign states a restriction to automobiles, the sign should specify motor vehicles, as a bicycle is a vehicle by Colorado state law.	Mount freestanding along private park roadways and/or trails.
		Traffic Control/ Warning wall mounted	Used for traffic control and warning information (e.g. Yield, Stop, etc.). All such signs shall conform to the standards described in the "Manual on Uniform Traffic Control Devices" (MUTCD). When a sign states a restriction to automobiles, the sign should specify motor vehicles, as a bicycle is a vehicle by Colorado state law.	Mount to wall along private park roadways and/or trails to carry large traffic control information (see Traffic Control). Use where pole mounted signs are impossible or inappropriate.
		Trail ID Pole Mounted	Set sign back from trail as stipulated in CCD Bicycle Master Plan. See Program Elements-Trails section for further signage information.	Mount freestanding along bicycle trails to identify trails or to provide direction at intersections.

### 3.8.12 Lighting

DPR coordinates street and pedestrian lighting on park land with Xcel Energy. Lighting designs of roadways and other designated areas shall be completed by a lighting design professional following IES guidelines where applicable. Parks shall have final review and approval of all such design. All lighting in public ROW (including street and pedestrian lighting) shall be coordinated and must be approved by Denver Public Works. Illumination levels shall be provided for all plans extending 100 feet beyond planning boundaries in all directions. All lighting fixtures, poles and bases are to be Federal Green unless otherwise stated. Contact Xcel Energy for current model numbers. Light pole mow strips shall be provided for all light poles located in lawn areas. Mow strips shall be provided and installed by Parks or their designated contractor. Utility facilities (transformers, switch cabinets, etc.) should be easily accessible by maintenance vehicles and grouped to the greatest extent possible. See Program Elements for requirements for lighting Athletic Fields. See Landscape section for street tree and lighting spacing requirements. The following table lists recommended lighting distances from objects.

Table 3.8.12.1 Light Spacing Distances	
Object	Distance from
Street Tree	20'
Traffic Signal Pole (for pedestrian lights only)	30'
Stop Sign (for pedestrian lights only)	30'
Driveway	10'
Face of curb (to center of pole)	3'
Fire Hydrant	10'
Sidewalks (to center of pole)	3'



*Hockey puck style road, parking lot and security lighting*

Private Park Road Lighting. Maintenance trucks shall have access to all private street lighting for relamping and maintenance purposes.

Model. Xcel Energy “Hockey puck” maximum pole height 35 feet, Pole spacing along a private park road (maximum width 36 feet) is approximately 225-250 feet. One pole is required at each road intersection.

Parking Lot & Security Lighting. Maintenance trucks shall have access to all parking lot and security lighting for relamping and maintenance purposes. Parking and interior drives shall be lighted and use consistent source colors and even, uniform light distribution. The use of a greater number of low fixtures in a well organized pattern is preferred over the use of a minimum number of tall fixtures. At no point should lighting levels in parking and service areas exceed 8 foot candles when measured at the ground.

Model. Xcel Energy “Hockey puck” maximum pole height 30 feet.

Pedestrian Lighting. The majority of pedestrian lighting within a park should be dark-sky compliant. Utilize internal baffling or other methods if possible to create dark-sky compliant fixtures. Maintenance trucks shall have access to all

pedestrian lighting for relamping and maintenance purposes. Placement of fixtures should provide a coordinated and organized plan that facilitates uniform light levels and works with the placement of sidewalks, landscaping, signage, building entries and other features to contribute to the overall appearance of the park. See Hardscape for walkway lighting standards.

Model. Spacing is typically 70-100 feet. Pole heights and bases may vary from fixture to fixture in order to provide variety. Limit lumen levels to 3500 lumens per fixture if possible. The following table (3.8.12.2) lists DPR and Xcel approved pedestrian lighting.

Table 3.8.12.2 Pedestrian Lighting		
Light	Style	Picture
Globe	Historic-simple	
Acorn	Historic-ornate	
Harp	Historic-MidCentury	
Zed	Modern-ornate	
Metropolitan	Modern-simple	

Trail & Natural Area Lighting. Maintenance trucks shall have access to all trail lighting for relamping and maintenance purposes. Natural Area lighting should take into consideration the area classification for wildlife (i.e., active use, conservation/restoration, etc.).

Model. Use security lighting standards for lighting trails. Use Xcel Energy accepted wall lights when necessary.

Architectural Lighting (Building, Bollards, Wall & Uplights). DPR is responsible for purchasing, installing and maintaining all architectural lighting without the assistance of Xcel Energy. Architectural lighting should be used sparingly and should be used to help identify entries, park identification signage or provide for

---

additional safety lighting (such as along stairs, under bridges, etc.). Architectural lighting should be of a low level and not spill light and glare onto adjacent properties.

Model. Lighting to be approved by Project Manager.

Role of Xcel Energy for Streetlight and Pedestrian Light Maintenance. The City of Denver does not install, own or perform maintenance on any of the streetlights or pedestrian lights that are placed in the public ROW or in parks, unless the lighting fixture was not approved by Xcel Energy. Approved lights are owned and operated by Xcel Energy in conformance with the most current Xcel Energy tariffs. Per the tariff, Park pays a monthly charge for energy usage and routine maintenance. For all other maintenance or damaged facilities, additional fees are assessed. For non-approved lighting fixtures, Xcel Energy can still supply the power feed for these units and arrange for them to be billed to DPR through metered service. The use of non-approved lighting is strongly discouraged and requires review/approval of the DPR Director of Planning.

Xcel Energy-owned lighting systems. To report a lighting system outage or malfunctioning light, log on to the Xcel Energy outage-reporting page at [www.xcelenergy.com/odl/](http://www.xcelenergy.com/odl/) or call 1-800-895-4999. Including the grid identification number (labeled on the pole) facilitates Xcel Energy investigating the outage. See the Web page for additional details.

#### Coordination of Lighting Design and Installation within a Park

1. Site plan is submitted to DPR showing both existing and proposed lighting locations based on criteria provided.
2. Site Plan is reviewed by DPR. Site Plan must also be reviewed by Public Works if lighting is proposed in the ROW.
3. Comments returned to project team.
4. Final plan approved by Project Manager.
5. Copy of Final Plan is forwarded to Xcel Energy by DPR so an electric distribution design and cost estimate can be prepared. Can take up to 120 days.
6. Xcel sends cost estimate and plan to DPR for review.
7. Comments returned to project team and revisions made by Xcel Energy.
8. Xcel Energy sends final cost estimate and plan to DPR for payment or encumbrance.
9. Once Xcel Energy receives payment, light poles are ordered and construction is scheduled. Can take up to 120 days.
10. Lights installed by Xcel Energy and final inspection conducted by DPR.



## 3.9 Water Features & Lakes

Historically, water features and lakes have been a part of the DPR system for over 100 years. They are recreational amenities and aesthetically pleasing elements. Currently, new methods for combining water as an amenity with water quality treatment and stormwater conveyance are being routinely practiced.

Because of its value to quality of life, water is still a highly sought after component within parks. However, water features and lakes can add to up-front costs, create extensive on-going maintenance costs and impact water use. The design and placement of water features and lakes should take all these issues into consideration.



*Cheesman Fountain*

### 3.9.1 Water Features



*H2 Odyssey- Interactive Water Feature (City Park)*

Water features may come in various forms, shapes, and sizes to suit the aesthetic needs of the park and the park setting. Examples of water features include reflecting ponds, decorative fountains, and interactive/play features (see Appendix L for a list of water features). Of paramount concern is public health and safety while providing a sustainable and efficiently maintained product. See DPR Facilities for further fountain requirements for equipment and vault facilities (see Appendix K).

**Water Quality.** Water features intended for human water contact shall be designed to maintain water quality in accordance with the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division's 5 CCR 1003-5; Swimming Pools and Mineral Baths (April 1998).

**Sustainability.** Water features shall be designed with sustainability and energy conservation in mind. Water recirculation and programmable controllers are examples of sustainability in design. Water collection and circulation systems shall be water tight and capable of maintaining water integrity for the life of the feature. Environmentally-friendly products should be used for maintenance of water features.

**Safety.** For water contact features, walking surfaces shall be non-skid surfacing. Use a horizontal or vertical deterrent for features not intended for water contact. Use appropriate rules and regulation signage and water quality signage for water features.

Mechanical Equipment Enclosures. Enclosures housing supporting equipment shall be weather tight but vented and provide adequate space for easy access to mechanical and electrical components requiring maintenance. Provide easy access to and inside the enclosure. Locate and screen the enclosure by considering aesthetic implications to the surrounding water feature and park. Use above ground enclosures whenever possible to minimize flood damage.

Maintainability. Operating component parts shall be commonly available on the open market and have a good track record of reliability. The system design shall provide for efficient winterization of the system to protect it from freezing. All water features shall have a dedicated water tap and shall be connected to the sanitary sewer for drainage.

### 3.9.2 Lakes & Ponds

Lake management, protection and design is thoroughly discussed in the "Lake Management and Protection Plan - 2004." The following summarizes some of the recommendations of the plan:

- Involve all pertinent agencies in the (re)design of lakes including Public Works Wastewater & Water Quality, the Water Quality Committee, the Department of Environmental Health, Denver Water, Division of Fish and Wildlife and Vector Control under Animal Control in order to address the entire system.
- Use natural vegetation, as designated by the Natural Areas Unit, along the shoreline (area where lake and land meet), littoral zone (shallow zone of the lake which can be occupied by rooted plants) and shoreland (minimum 30' from high water level, use considerably more than 30' when possible). Natural vegetation helps to filter sediment and nutrients thereby positively impacting water quality, creating wildlife habitat in order to increase diversity of species, restoring the lakes biological integrity and reducing human/goose conflicts. Use natural vegetation in forebays whenever possible.
- Determine nutrient budgets for areas that drain into lakes by utilizing soil testing within 1000' of a lake to determine fertilizer needs. Test non-potable irrigation water to determine the concentration of nutrients, and if needed, adjust fertilizer based upon the results of the previous two recommendations.
- Use the IPM (Integrated Pest Management) Plan to reduce the use of pesticides.
- When turf must be used within the shoreland zone, establish a no-mow zone adjacent to lakes to reduce nutrient loading resulting from decaying grass clippings
- Establish a monitoring system for vegetation (removal and replacement) and sediment control .
- Manage water flow for a lake by trying to create a sustained flow and by designing/modifying the input and overflow/output to maximize the circulation of the lake water and avoid short circuiting (zones of stagnant water within an otherwise functional system created by the design of the inlets and outlets). Provide for mechanical mixing (ex. aeration) when natural circulation cannot be achieved.



*Ferrill Lake (City Park)*



*Sloan's Lake*



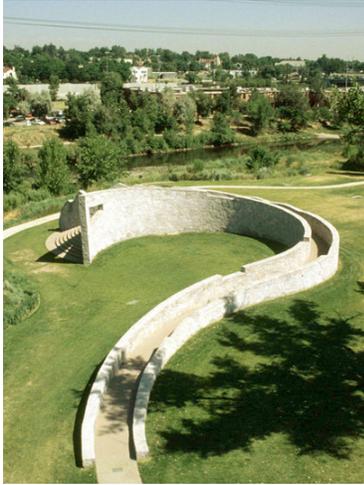
*Smith Lake  
(Washington Park)*

- 
- Work with Environmental Health to create a management plan regarding environmental health issues. Discourage invasive species through lake maintenance.
  - Provide a water augmentation plan where necessary.
  - Lakes and ponds shall be lined to prevent commingling with groundwater.
  - Drainage and drainage design from outside development into DPR-owned lakes and ponds shall be approved by DPR.



### 3.10 Art in Parks

---



*Common Ground  
(Commons Park)*

Under the leadership of the citizens of the City and County of Denver, an adopted City Ordinance (Chapter 20, Article IV, Div. 4. Public Art Program, §§ 20-85--20-90) requires that capital improvement projects and bond monies with construction and design budgets over \$1,000,000 must allocate 1% of the estimated construction budget for the acquisition of public art.

Denver Commission on Cultural Affairs has developed the Public Art Process which outlines procedures including outreach guidelines for the selection of public art commissioned by the City and County of Denver. Consider the following in locating art in parks: maintenance access, utility lines, irrigation lines, safety issues and ADA accessibility.

DPR is not responsible for the maintenance of public art. Art donated to DPR is maintained by DPR and therefore shall be reviewed by DPR. See Appendix M for an approximate list of art in Denver Parks.



*Art at Burns Park*



### 3.11 Parkways and Boulevards



*East 17th Avenue Parkway*

Table 3.11.1 lists the minimum parties that must be involved in any design and construction of Parkways and Boulevards. DPR Standards, including landscape and irrigation, shall apply to all medians that are DPR’s maintenance responsibility.

Table 3.11. 1 Review Responsibility Table			
Design/Construction Item	DPR	PW	CPD
ROW adjacent to a Park	x	x	
Existing Parkway/Boulevard ROW	x	x	x
New Parkway/Boulevard ROW Geometry	x	x	x
Median Geometry	x	x	x

The following definitions are provided to help clarify the meanings of ROW, parkways and boulevards.

- Right-of-Way: Public land that includes the street, the tree lawn and the sidewalk. Parkways and boulevards are within the public ROW.
- Parkway and Boulevard: One of 35 streets that are designated as a parkway or boulevard by City ordinance that includes: Public right-of-way, Parkway building setback (on private property). Parkway Building Setback and Parkway Sign Setback apply only to designated parkways and boulevards.
  - Parkway Building Setback: The distance from the right-of-way that structures can be located along a parkway or boulevard. Setback distances are established by the DPR Rules and Regulations Governing Building Line Restrictions around Parkways to create a visually open green space that extends the park-like character to the building edge.
  - Parkway Sign Setback: The distance from the right-of-way that signs, such as commercial signs, shall be located along a parkway or boulevard. Setbacks are established by the DPR Rules and Regulations Governing Sign Restrictions around Parkways to ensure that the visual open character of the parkway or boulevard is protected. Parkway sign setback does not apply to traffic signage.
- Tree Lawn: The area between the sidewalk and the curb that is a character-defining feature of many parkways or boulevards. Tree lawns are typically wide to create a distinctive park-like setting and are often planted with street trees to create a continuous canopy. Although they are within the City’s right-of-way, tree lawns are maintained by the adjacent property owner.
- Median: A broad, landscaped island that is located between two directions of travel, usually landscaped with trees and shrubs. Not every parkway or boulevard has a median. Medians must be designed with both aesthetic and functional characteristics in mind, such as respecting traffic sight-lines.

Parkways and Boulevards. The Parkway Building Line Restrictions Regulations provide guidance for each of the existing 35 designated parkways and

---

boulevards.

Both the Parkway Building Line Restrictions Regulations and the CPD Rules and Regulations for General Development Plans section 5.2.3 can provide direction for new parkways and boulevards. Although existing parkways and boulevards share certain unifying features, it should be noted that each is distinct. Therefore, design for new parkways and boulevards should consider both unifying features to tie them into the overall Denver system and new unique features that set them apart and help to establish new unique features that set them apart and help to establish a unique character for an area. Future parkways and boulevards should also consider sustainable features, such as the integration of stormwater into the design.

General Parkway and Boulevard Landscape Characteristics:

- Street Cross Section (Develop in coordination with DPR, PW, & CPD)
- Spacious Tree lawn
- Continuous Open Space (Back of Curb to Building Edge)
- Plantings of Trees and Shrubs
- Buildings that Face the Street
- Topographic Changes
- Views and Vistas

The following topics are discussed in the Parkway Building Line Restrictions Regulations:

- Building Setbacks
- Sign Setbacks
- Allowed Encroachments
- Prohibited Encroachments
- Review Process
- Submittal Requirements
- Process for Setback Exception
- Appeals

Maintenance. Parkway and boulevard medians will only be maintained by DPR with written approval and a maintenance agreement from the Manager of DPR prior to median construction.



*MLK Median with raised planters*

### 3.12 Medians and Traffic Islands

DPR Standards, including landscape and irrigation, shall apply to all medians and traffic islands that are DPR's maintenance responsibility. Medians and traffic islands will only be maintained by DPR with written approval and a maintenance agreement from the Manager of DPR prior to construction.

Design. Medians shall be designed with the safety of maintenance staff in mind and shall provide curb cuts for maintenance access.

Splash pans shall be included on medians to aid in maintenance. Concrete splash pans shall be 12 to 18 inches wide from the back of curb. See the DPR Median Design Guidelines for further information and detailed drawings.



*Splash pans on medians*



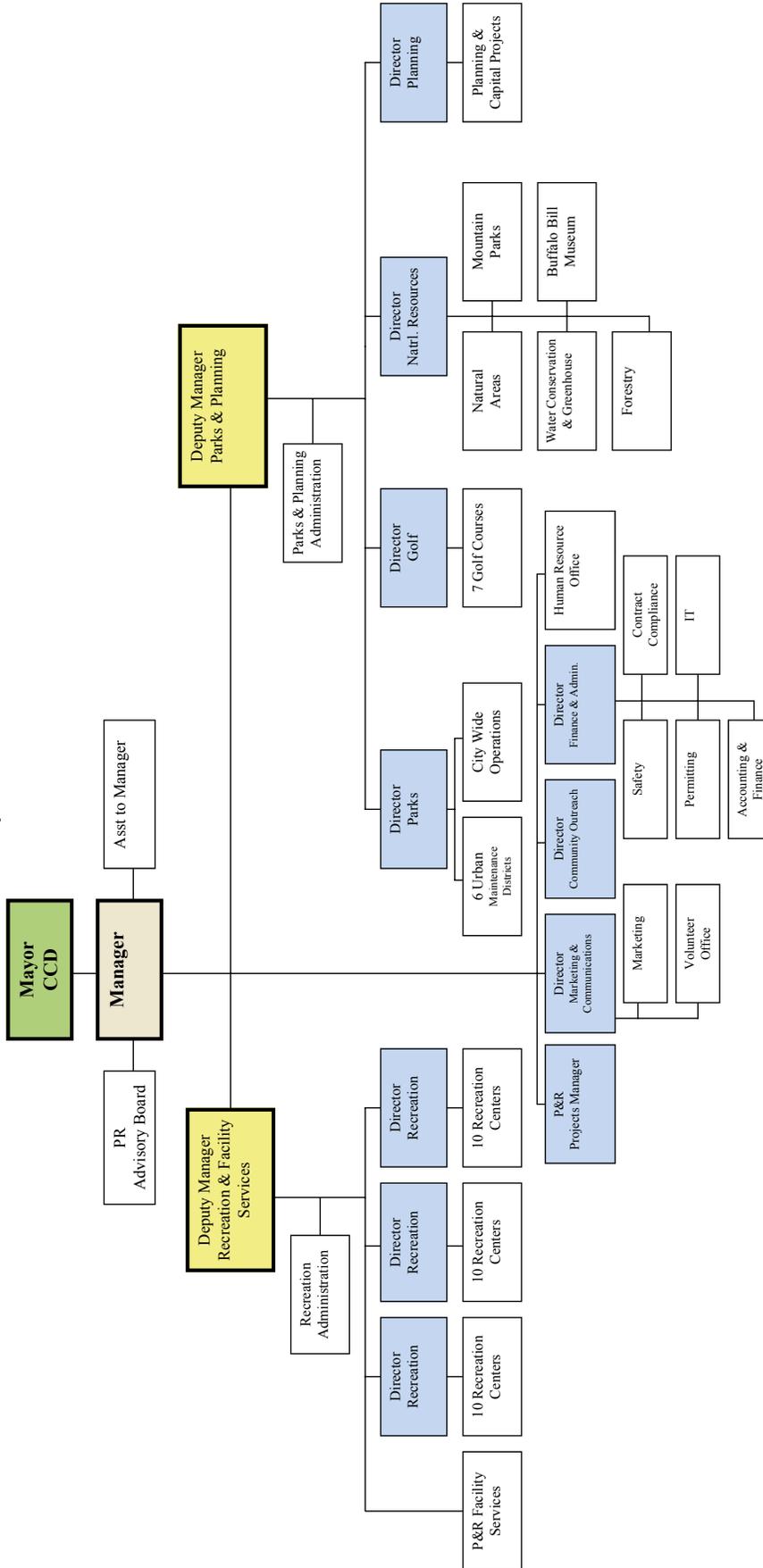
---

## Appendix

- Appendix A DPR Organization Chart
  - Appendix B Colorado Vegetation Full Document
  - Appendix C Variance Form
  - Appendix D DPR Approved Street Trees
  - Appendix E Executive Order No. 87
  - Appendix F DPR Structures
  - Appendix F DPR Structures
  - Appendix F DPR Structures
  - Appendix G Trail Information
  - Appendix H Off-leash Dog Area Application
  - Appendix I Signage Details
  - Appendix J Gifts/Sponsorships/Naming Request Policy
  - Appendix K Fountain Requirements for Equipment and Vault Facilities
  - Appendix L DPR Water Features
  - Appendix M DPR Art in Parks
  - Appendix N Executive Orders for Standards
- 
- Attachment 1 Greenprint Denver Office and Sustainability Policy
  - Attachment 2 Project Sustainability Form Attachment

# Parks and Recreation Organization Chart

January 3, 2006





The Colorado Vegetation Classification Project (Colorado Division of Wildlife (CDOW), Bureau of Land Management (BLM), and U.S. Forest Service (USFS))		
TYPOLOGY	HABITAT	HABITAT DESCRIPTION
1 URBAN/ BUILT UP: High density commercial or high density residential areas.	11 RESIDENTIAL: High density residential areas, consisting of homes, lawns, and planted trees, or parks and golf courses. 12 COMMERCIAL: High density urban areas with little vegetation, parking lots, buildings, etc.	
2 AGRICULTURE: Row crops, irrigated pasture and hay fields, dry farm crops.	21 DRYLAND AGRICULTURE: Dryland crops and fields. 22 IRRIGATED AGRICULTURE: Irrigated crops and fields. 23 ORCHARD: Agricultural areas consisting of orchards.	
3 RANGE-LAND: Consists of grass/forb range, shrub/brush range, or mixed range.	31 RANGE-FORB RANGELAND: Perennial and annual Grasslands. Low elevation (< 6,000') species include Blue Gramma, Needle & Thread, Sand Drop Seed, and brome species. Mid elevation (> 6000' and < 9500') species include Wheatgrass, Smooth Brome, Blue Gramma, Cheat-grass, dandelion, Spearleaf Buckwheat, and clover. In the southeast plains region of Colorado, grasslands are often associated with yucca and various cacti species, such as cholla, and prickly pear. 32 SHRUB/BRUSH RANGELAND: Consists primarily of sagebrush (ARTR2), salt-brush (ATCA2), greasewood (SAVE4), and snakeweed (GUSA). 33 SHRUB/GRASS/FORB MIX: Mixed grass/forb and shrub/grass rangeland. Example species include:	3101 SNAKEWEED/SHRUB MIX: Desert and low elevation shrubland dominated by Snakeweed but heavily associated with Greasewood, sagebrush, and saltbush. 3102 GRASS DOMINATED: Rangeland dominated by annual and perennial grasses. Example species include: Needle & Thread, Western Wheatgrass, Crested Wheatgrass, Kentucky bluegrass, Bluebunch wheatgrass (POPR), or Galletta grass. 3103 FORB DOMINATED: Rangeland dominated by forbs. Example species include: arrowleaf balsamroot (BASA3), ligusticum (LIGUS), meadowrue (THAL12), false hellebore (VETE4), and muleseats wethia (WYAM). 3104 GRASS/FORB MIX: Rangeland codominated by grasses and forbs. Example species include: Arrowleaf balsamroot (BASA3), Gumweed (GRIND), Mule's ear-wyethia (WYAM), Prairie junegrass (KOM4), Western wheatgrass (PASM), lupine, or Kentucky bluegrass. 3105 TALL-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Big Bluestem (ANGE), Indian grass (SONU), Little bluestem (SCSC) and Switchgrass (PAV1). 3106 MID-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Sideoats grama (BOCU), Galletta (HUA), Foxtail barley (HOJU), Western wheatgrass (PASM), Bluebunch wheatgrass (PSSP), Little bluestem (SCSC), New Mexico feathergrass (STNE), Green needlegrass (STV) and Needle-and-Thread (STCO). 3107 SHORT-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Blue grama (BOGR) and Buffalo grass (BUDA). 3108 SAND DUNE COMPLEX: Grassland present in the eastern plains region. Species include Prairie sandreed (CALO), Sand bluestem (ANHA), Sand dropseed (SPCR), Sandhill muhly (MUPU), and Common reed (PHAU), Blowoutgrass (REFL) and Lemon scurfspea (PSLA). 3109 FOOTHILL/MOUNTAIN GRASSLANDS: Grassland present primarily on the western slope. Species include Parry oatgrass (DAPA), Arizona fescue (FEAR), Idaho fescue (FEID), Thurber fescue (FETH), Slimstem muhly (MUF1), Mountain muhly (MUMO), Bluebunch wheatgrass (PSSP), Needle-and-Thread (STCO), Junegrass (KOM4), wildrye (ELYMU) and Slender wheatgrass (ELTR). 3110 DISTURBED RANGELAND: Disturbed or overgrazed rangeland in the NW region. Species include Broom snakeweed (GUSA2), Cactus (Opuntia spp.), Yucca (Yucca spp.), Cheat-grass (BRTE), Medusahead rye (TAAS), Halletton (HAGL), Russian thistle (SAXA), and tumble mustard (SIAL2). 3111 SPARSE GRASS/BLOWOUTS: Sparsely vegetated grasslands, 10 - 40% vegetation, indicative of blowouts. 3201 SAGEBRUSH COMMUNITY: Shrubland principally dominated by ARTR2, ARNO4, and/or ARF12. Often associated with Rabbitbrush (CHNA2), Bitterbrush (PUTR2), Broom Snakeweed (GUSA2), various grasses, and mixed cacti. Greasewood (SAVE4), Serviceberry (AMAL2 or AMUT), Snowberry, or Winterfat (KRLA2) may also be present as secondary species. 3202 SALTBLUSH COMMUNITY: Shrubland found on upland, alkaline soils, principally dominated by Shadscale (ATCO), Four-Wing Saltbush (ATCA2), and Mat Saltbush (ATCO4). Community sometimes codominated by Basin or Wyoming Big Sagebrush (ARTR1 or ARTRW8). Often associated with Snakeweed, Bud Sagebrush (ARSP5), Spiny Hopsage (GRSP), Spiny or Spineless Hopsage (TESP2 or TECA2), and Gardeners/Nuttall's Saltbush (ATGA). Greasewood may occur here, but in some basins it may just be a minor component. 3203 GREASEWOOD: Desert and low elevation shrubland dominated by SAVE4. Associated with ATCA2, ATCO, GUSA2, ARTR2, various rabbitbrush species and various grasses. 3204 SAGEBRUSH/GAMBEL OAK MIX: Shrubland co-dominated by Big Sagebrush and Gambel Oak. Patchy distribution of both species, with mixed grass/forb understorey. 3205 SNAKEWEED: Desert and low elevation shrubland dominated by GUSA2. Associated with ATCA2, SAVE4 and various grasses in low densities. 3206 SNOWBERRY: Deciduous shrubland dominated by Mountain Snowberry (SYOR2). 3207 SNOWBERRY/SHRUB MIX: Mountain deciduous shrubland dominated by Mountain Snowberry. Often associated with Saskatoon Serviceberry, sagebrush, Squawbush, Rabbitbrush and Gambel Oak. 3208 BITTERBRUSH COMMUNITY: Shrubland principally dominated by Bitterbrush (PUTR2). Often associated with Rabbitbrush, Sagebrush, Greasewood, various grasses, and mixed cacti. 3209 SALT DESERT SHRUB COMMUNITY: Low-elevation shrublands found on alluvial salt fans or flats. Component species may include: saltbushes, greasewood (SAVE4), sagebrushes, hopsagebrushes, and spiny hopsage (GRSP). 3210 SAGEBRUSH/GREASEWOOD: Shrubland codominated by sagebrush and greasewood. Secondary species may include rabbitbrush, and Blue Gramma. 3301 SAGEBRUSH/GRASS MIX: Codominant sagebrush shrubland and perennial Grassland. Principal shrub species include Big Sagebrush, 3-winged Sage, and Black Sage. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma. 3302 RABBITBRUSH/GRASS MIX: Co-dominant Rabbitbrush and perennial Grassland. Principal shrub species include Rubber Rabbitbrush (CHNA3), Sticky Rabbitbrush (CHV18), and Small Rabbitbrush (CHDE2). Grassland species are the same as cover type Sagebrush/Grass. 3303 SAGEBRUSH/MISC MOUNTAIN SHRUB MIX: Co-dominant sagebrush shrubland consisting of Mountain Big Sagebrush (ARTRV) and any combination of Mountain Snowberry (SYOR2), SYRO, Service Berry (Utah AMUT or saskatoon AMAL2), Squaw apple (PERA4) or bitterbrush (PUTR2), often with a grass/forb understorey. Understorey species may include, among others, Elk Sedge (CAGE2), Bluegrass, Needlegrass, arrowleaf balsamroot, lupines, penstemons, Indian paintbrush, and Mariposa lily. Often found at the higher elevations of the sagebrush zone, on north facing slopes, in basins, or on other mesic sites. 3304 GRASS/MISC CACTUS MIX: Low elevation perennial Grassland codominated with cacti shrubland. Grass species include Blue Gramma, Needle & Thread, Sand Drop Seed, and brome species. Cholla cactus dominant, but other species and shrubs present in low density include Prickly Pear Cactus, Yucca, and Hairy Sage. No Cholla cactus is present north of the Palmer Divide. Prickly Pear and Yucca become dominant in the NE region. 3305 WINTERFAT/GRASS MIX: Codominant shrubland and perennial Grassland. Eurotia species of winterfat mixed with Blue Gramma. Rabbitbrush often present. 3306 BITTERBRUSH/GRASS MIX: Codominant shrubland and perennial grassland. Principal shrub species include Bitterbrush with some Rabbitbrush. Sagebrush and Greasewood present. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma. 3307 GRASS/YUCCA MIX: Codominant perennial grassland and cactus shrubland. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma. Principal cactus species include Yucca potentially mixed with Prickly Pear. 3308 SAGEBRUSH/RABBITBRUSH MIX: Co-dominant Sagebrush and Rabbitbrush shrubland. Principal shrub species include Basin Big Sagebrush (ARTRT), Wyoming Big Sagebrush (ARTRW8), Rubber Rabbitbrush (CHNA3), Sticky Rabbitbrush (CHV18), or Small Rabbitbrush (CHDE2).

*Appendix B Colorado Vegetation Full Document*

<p><b>4 WOODLAND:</b> Consists primarily of pinyon/juniper, oak or P/J/oak mixed.</p>	<p>41 CONIFEROUS WOODLAND: Woodlands of pinyon/juniper (PIED/JUSC2). 42 DECIDUOUS WOODLAND: Woodlands of Gambel oak (QUGA) and mountain shrub mix. Example species include: 43 MIXED WOODLAND: Woodlands of P/J/oak mix or P/J/mountain shrub mix. Example species include:</p>	<p>4101 PINYON-JUNIPER: Coniferous woodland principally co-dominated by Pinyon Pine (PIED) and Utah Juniper (JUOS) or Rocky Mountain Juniper (JUSC2). Understorey is sagebrush, mixed mountain shrubs, or grasses, usually at less than 25% cover. 4102 JUNIPER: Woodland principally dominated by Utah Juniper (JUOS) or Rocky Mountain Juniper (JUSC2). Understorey may be sagebrush, grass, or bare soil. 4201 GAMBEL OAK: Deciduous woodland (or tall shrubland) dominated by Gambel Oak. Primary associated shrub species include Mountain Mahogany (CEMO2), Utah Serviceberry (AMUT), Saskatoon Serviceberry (AMAL2), Big Sagebrush, and to a lesser extent, Mountain Snowberry (SYOR2). 4202 XERIC MOUNTAIN SHRUB MIX: Deciduous woodland (or tall shrubland) dominated by Mountain Mahogany (CEMO2) or Curlleaf Mountain Mahogany (CELE3). Associated species may include sagebrush, rabbitbrush, Mormon tea, or scattered Pinyon pine or Utah Juniper. 4203 MESIC MOUNTAIN SHRUB MIX: Deciduous woodland (or tall shrubland) codominated by Gambel Oak, Serviceberry, and/or Mountain Mahogany. Primary associated shrub species include Snowberry, sagebrush, or chokecherry. Secondary shrub species may include Skunkbush sumac (RHTR), Antelope bitterbrush (PUTR2), and Squawapple (PERA4). 4204 SERVICEBERRY/SHRUB MIX: Deciduous woodland (or tall shrubland) dominated by Utah and Saskatoon Serviceberry (AMAL2). Primary associated shrub species include Big Sagebrush, Mountain Snowberry, and Gambel Oak. 4205 UPLAND WILLOW/SHRUB MIX: High elevation shrubland (&gt;11,500') dominated by willow species such as Snow, Arctic and Montane Willow. Associated shrubs include Common Gooseberry and Common Juniper. Occasionally Plane-Leaf Willow is present boggy areas and may function more as a riparian site than an upland site. 4206 MANZANITA: Deciduous shrubland dominated by Manzanita (ARCTO3). Often associated with sagebrush, rabbitbrush, or various grasses and forbs. 4301 P-J-OAK MIX: Codominant deciduous/coniferous woodland. Conifer species are Pinyon Pine and Utah or Rocky Mountain Juniper. Deciduous tall shrubs are dominated by Gambel Oak. 4302 P-J-SAGEBRUSH MIX: Codominant woodland and shrubland. Woodland consists of Pinyon Pine and Utah Juniper or Rocky Mountain Juniper at densities just above 25%. Big Sagebrush grows in the interspaces between the trees and may comprise at least 25% cover. 4303 P-J-MINT SHRUB MIX: Codominant deciduous/coniferous woodland. Conifer species are Pinyon Pine and Utah or Rocky Mountain Juniper. Deciduous tall shrubs are dominated by Gambel Oak, Mountain Mahogany, Serviceberry, and sagebrush. 4304 SPARSE P-J-SHRUB/ROCK MIX: Open canopy coniferous woodland co-dominated by Pinyon Pine (PIED) and Utah Juniper (JUOS) or Rocky Mountain Juniper (JUSC2) at less than 25% cover. Understorey is mixed, often bare soil, or less than 25% sagebrush, Gambel Oak, Serviceberry, Mountain Mahogany or grass. 4305 SPARSE JUNIPER/SHRUB/ROCK MIX: Open canopy woodland dominated by Utah Juniper (JUOS) at less than 25% cover. Understorey is mixed, often bare soil, or less than 25% sagebrush, mountain mahogany, Mormon tea (EPHED), or bitterbrush (PUTR2). 4306 JUNIPER/SAGEBRUSH MIX: Codominant woodland and shrubland. Woodland consists of Utah juniper (JUOS) at densities around 25%. Big sagebrush grows in the interspaces between the trees and may comprise 25% cover or more. 4307 JUNIPER/MTN SHRUB MIX: Codominate Juniper species and Oak, Mtn Mahogany, or other deciduous shrubs.</p>
<p><b>5 FOREST LAND:</b> &gt; 25% forested land (deciduous, coniferous, and mixed forests).</p>	<p>51 DECIDUOUS FOREST LAND: Forests of aspen (PRTR5) or aspen/oak mix. 52 CONIFEROUS FOREST LAND: Forests consisting of one or more evergreen tree species. Example species include: Ponderosa Pine (PIPO), Douglas Fir (PSME) and spruce/fir mix. 53 MIXED FOREST LAND: Forests consisting of a mixture of coniferous and deciduous trees or tall shrub species. Example mixes include: pine/oak, fir/aspens, or pine/aspens mix.</p>	<p>5101 ASPEN: Deciduous Forest dominated by Quaking Aspen (POTR5). Associated shrubland understorey species include Snowberry, Serviceberry, and Common Juniper. 5102 ASPEN/MESIC MOUNTAIN SHRUB MIX: Codominant deciduous forest and shrubland. Primary forest species is Quaking Aspen with Serviceberry, Snowberry, Mountain Big Sagebrush, or Gambel Oak as the primary shrubland species. 5201 PONDEROSA PINE: Coniferous forest dominated by Ponderosa Pine (PIPO). Associated conifer species include Pinyon Pine and Utah or Rocky Mountain Juniper at the lower elevations, and Douglas Fir/Blue Spruce at the higher elevations. 5202 ENGLEMANN SPRUCE/FIR MIX: Coniferous forest dominated by Englemann Spruce (PIEN) and Sub-Alpine Fir (ABLA). Associated conifers include Douglas Fir and Lodgepole Pine. 5203 DOUGLAS FIR: Coniferous forest dominated by Douglas Fir (PSME). Associated conifers may include White Fir, Engelmann Spruce and Ponderosa Pine. 5204 LODGEPOLE PINE: Coniferous forest dominated by Lodgepole Pine (PICO). Associated trees include Sub-alpine Fir, Douglas Fir, Englemann Spruce, and Aspen. 5205 SUB-ALPINE FIR: Coniferous forest dominated by Sub-Alpine Fir (ABLA). Associated trees include Aspen, Lodgepole Pine, and Englemann Spruce. 5206 SPRUCE/FIR REGENERATION: Harvested PIEN/ABLA sites, in regeneration. 5207 SPRUCE/LODGEPOLE PINE MIX: Coniferous forest codominated by Englemann Spruce and Lodgepole Pine. 5208 BRISTLECONE PINE: Coniferous forest dominated by Bristlecone Pine (PIAR). Associated conifers include Ponderosa Pine, Limber Pine, Douglas Fir and Englemann Spruce. 5209 PONDEROSA PINE/DOUGLAS FIR MIX: Coniferous forest codominated by Ponderosa Pine and Douglas Fir. Community may include Pinyon pine. 5210 PONDEROSA PINE/BLUE SPRUCE MIX: Coniferous forest codominated by Ponderosa Pine and Blue Spruce. 5211 LIMBER PINE: Coniferous forest dominated by Limber Pine (PIFL). Associated conifers include Ponderosa Pine, Limber Pine, Douglas Fir and Englemann Spruce. 5212 SPRUCE/FIR/LIMBER PINE MIX: Mixed forest land codominated by PIEN/ABLA and PIFL. Associated conifers include Ponderosa Pine and Douglas Fir. 5213 LODGEPOLE/SPRUCE/FIR MIX: Coniferous forest codominated by Lodgepole Pine, Engelmann Spruce, and Subalpine Fir. 5214 FIR/LODGEPOLE PINE MIX: Coniferous forest codominated by Sub-Alpine Fir and Lodgepole Pine. 5215 DOUGLAS-FIR/ENGELMANN SPRUCE MIX: Coniferous forest codominated by Douglas-Fir and Englemann Spruce. 5301 SPRUCE/FIR/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Englemann Spruce/Sub-alpine Fir and Quaking Aspen. Associated conifers include White Fir and Douglas Fir. 5302 P-PINE/GAMBEL OAK MIX: Codominant coniferous forest and tall shrubland. Dominant species are Ponderosa Pine and Gambel Oak. 5303 PONDEROSA PINE/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Ponderosa Pine and Quaking Aspen. Associated shrubland species are mesic mountain shrubs. 5304 DOUGLAS FIR/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Douglas-Fir and Quaking Aspen. Associated conifers include Ponderosa Pine and Englemann Spruce. 5305 P-PINE/ASPEN/GAMBEL OAK MIX: Codominant mixed forest and tall shrubland. Ponderosa Pine dominates, with various densities of Aspen and Gambel Oak equaling &gt; 25% crown cover. 5306 LODGEPOLE PINE/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Lodgepole Pine and Quaking Aspen. 5307 SPRUCE/FIR/LODGEPOLE/ASPEN MIX: Mixed coniferous/deciduous forest codominated by Englemann Spruce, Subalpine Fir, Lodgepole Pine, and Quaking Aspen. 5308 P-PINE/MOUNTAIN SHRUB MIX: Codominant coniferous forest and shrubland. Primary forest species is Ponderosa Pine. Primary shrub species may include Serviceberry, Snowberry, Buckbrush/CEANO). Sagebrush or Mt. Mahogany in more xeric sites. Gambel Oak may occur here, but is generally a minor component. 5309 P-PINE/ASPEN/MESIC MOUNTAIN SHRUB MIX: Codominant mixed forest and tall shrubland. Ponderosa Pine and Aspen are the dominant forest species with mesic mountain shrubs comprising &gt; 25% canopy cover.</p>
<p><b>6 BARREN LAND:</b> Less than 10% vegetation.</p>	<p>61 ROCK: Less than 10% vegetation, rock outcrops, red sandstones, etc. 62 SOIL: Less than 10% vegetation, dominated by bare soil.</p>	<p>6101 TALUS SLOPES &amp; ROCK OUTCROPS: Talus and scree slopes, nearly 100% rock. Could include rock outcrops that may be lichen covered. 6201 DISTURBED SOIL: Areas where human activities have created bare ground. Examples include: mine tailings, quarries, mill tailings disposal sites.</p>

Appendix B Colorado Vegetation Full Document

<p><b>7 SUBALPINE/ TUNDRA:</b> Areas both above and below timberline consisting of alpine tundra and subalpine grass/forb meadow species.</p>	<p>71 ALPINE MEADOW: High elevation areas above treeline (&gt; 11,000 ') where alpine tundra vegetation includes grasses, forbs, and sedges. Principal species may include Alpine Timofny (PHAL2), Alpine Bluegrass (POAL2), Spike Trisetum (TRSP2), Alpine Sagebrush (ARSC), Yarrow, Alpine Avens (GERO2), American Bistort (POBI6), Sticky Polemonium (POVI), Wild strawberry (FRAGA), and/or sedge species. 72 SUBALPINE SHRUB COMMUNITY: Upper montane elevation (7,000-11,500 ft) shrubs consisting primarily of Shrubby Cinquefoil, Mountain Gooseberry, and with subalpine meadow species in the understory. 73 SNOW: Perennial snow fields. 74 SUBALPINE MEADOW: Below timberline, high elevation (approx 9,000-11,500') herbaceous vegetation.</p>	<p>7101 ALPINE FORB DOMINATED: &gt;11,500 ft. meadow dominated by alpine forbs. Example species include: 7102 ALPINE GRASS DOMINATED: &gt;11,500 ft. meadow dominated by alpine grasses. Example species include: 7103 ALPINE GRASS/FORB MIX: &gt;11,500 ft. mixed meadow codominated by alpine grasses and forbs. Example species include: 7401 SUBALPINE GRASS/FORB MIX: High elevation meadows (approx 9,000-11,500 ft) codominated by grasses and forbs. Commonly occurring species include: Cinquefoil (POTEN), Larikspur (DELPH), Groundsel (SENEC), Edible Valerian (VAED), Vetch (VICIA), Thurber's Fescue (FETH), Richardson's Geranium (GER), and California brome (BRCA5).</p>
<p><b>8 RIPARIAN:</b> Riparian areas along waterways or standing wetlands. Principal woody species include Narrowleaf and Common Cottonwood, Russian Olive, various willow species, and tamarisk. Herbaceous species include various sedges, Scouring Rush, and cattails.</p>	<p>81 FORESTED RIPARIAN: Wooded riparian areas consisting primarily of poplars. Example species include: 82 SHRUB RIPARIAN: Shrub riparian areas consisting primarily of shrubs. Example species include: willows, Red-osier dogwood (COSE16), Skunkbush Sumac (RHTR), Wood's Rose (ROWO), Bog birch (BENA), water birch (BEOC2), or currant (RIBES). 83 HERBACEOUS RIPARIAN: Non-woody riparian areas consisting primarily of sedges. Example species include:</p>	<p>8101 COTTONWOOD: Wooded riparian area dominated by Common Cottonwood (POFR2), Narrowleaf Cottonwood (POAN3), or Plains Cottonwood (POSAR) or Eastern Cottonwood (PODE3). 8102 BOX ELDER: Wooded riparian area primarily dominated by Box Elder (ACNE). Can be mixed with Common Cottonwood (POFR2), Narrowleaf Cottonwood (POAN3), or Plains Cottonwood (POSAR) or Eastern Cottonwood (PODE3). 8103 CONIFER RIPARIAN: Wooded riparian area dominated by Doug Fir, Blue Spruce (Pip) and/or Engelmann Spruce (PIEN), or codominated by Spruce, Aspen (POTR5), and Narrowleaf Cottonwood (POAN3). Associated species include: Rocky Mountain Juniper (JUSC2), Thinleaf Alder (ALINT), or willows. 8201 WILLOW: Shrub riparian or wetland area dominated by shrub willow. Example species include: 8202 EXOTIC RIPARIAN SHRUBS: Shrub riparian area dominated by Salt Cedar (TARA) or Russian Olive (ELAN). Often associated with willows or cottonwoods 8301 SEDGE: Herbaceous riparian or wetland areas dominated by sedges. Example species include: water sedge (CAAQ), beaked sedge (CAUT), Nebraska sedge (CANEZ), Baltic rush (JUBA), and bulrush (SCIRP). Common wetland grasses include: tufted hairgrass (DECE), reedtop (AGGI2), and reedgrass (CALAM).</p>
<p><b>9 WATER:</b> Open water such as lakes, streams, and rivers.</p>	<p>91 STANDING WATER: Consists of lakes and reservoirs. 92 RUNNING WATER: Consists of rivers and streams.</p>	





# Denver Parks + Recreation

## Planning Division

201 W. Colfax Ave., Dept. 601, Denver, CO 80202 p 720.913.xxxx f 720-913-xxxx

DPR Standards should be exercised in the presence of sound judgment. The standards do not preclude the use of different methods when special conditions or site specific conditions are a factor and when proper authorization is obtained. If a major deviation from the standards is necessary or desirable the Project Manager shall complete a DPR Standard Variance Form so that a change can be evaluated by Division Directors and analyzed as a possible future revision to the DPR Standards.

### Instructions

This request form **must be submitted by e-mail in Word format or PDF**. Please, **no faxed request forms**.

<b>Name</b>	
<b>Project</b>	
<b>Date of Request</b>	
<b>Brief Project Description</b>	

Describe the DPR Standards in which you wish to submit a variance. Include **DPR Standard including page number, substitution for the standard, reasoning for substitution**.

<b>DPR Standard (page)</b>	<b>Substitution</b>	<b>Reasoning</b>

Division Approval:

\_\_\_\_\_   
 DPR Planning Director

\_\_\_\_\_   
 DPR Parks Director

Submit for DPR Standard revision



Denver Parks Recreation - 2006 Street Tree Guide

Medium/Large Trees Botanical Name	Cultivar	Common Name	Zone	Ph	Moisture Level	Sq Ft of Canopy @ Maturity	General Habit	General Foliage	Management Issues
Acer grandidentatum	v Rocky Mountain Glow	Bigtooth Maple	5a	≤ 8.2	Xeric	962	50' High, 35' wide; broad and spreading.	Dark green to red and yellow in fall.	Prune for central leader, seed crop negligible.
Acer saccharum	v Green Mountain	Sugar Maple	3b	≤ 8.2	Mod	962	40' high, 35' wide; oval to round.	Dark green in summer to yellow-orange in autumn.	Can be salt sensitive.
Acer saccharum	v Legacy	Sugar Maple	3b	≤ 8.2	Mod	1257	60' high, 40' wide; symmetrical, upright oval.	Five lobed, glossy dark green in summer to red, orange, yellow in autumn.	Can be salt sensitive.
Aesculus hippocastanum		Common Horsechestnut	4a	≤ 8.2	Mod	1257	60' high, 40' wide; dense symmetrical oval.	Palmate, dark green in summer to yellow in autumn. White showy flowers in spring.	Large spiny fruit and twig drop, scorch.
Aesculus octandra		Yellow buckeye	4a	≤ 8.2	Mod	962	40' high, 35' wide; dense symmetrical oval.	Palmate dark green in summer to yellow, brown in autumn.	Large fruit and twig drop, scorch.
Celtis occidentalis		Hackberry	2b, 3a	≤ 8.2	Xeric	1256	40' high, 40' wide; pyramidal when young, irregular-rounded when mature.	White/green showy flowers in spring.	
Ceridiphyllum japonicum		Katsurafree	4b	≤ 8.2	Mod	1257	40' high, 40' wide; upright pyramidal to rounded.	Light to medium green in summer, yellow in fall	
Corylus corluna		Turkish Filbert	5a	≤ 8.2	Min	706	40' high, 30' wide; Broadly pyramidal, conical.	Dark green and leathery in summer, potentially yellow to purple in autumn.	Does not tolerate compaction well.
Fraxinus americana	v Autumn Purple	White Ash	5a	≤ 8.2	Min to Mod	962	50' high, 40' wide; Round habit	Reddish-purple to deep red in autumn	Fruit may be a problem.
Fraxinus americana	v Rosehill	White Ash	5b	≤ 8.2	Min to Mod	962	50' high, 40' wide; upright oval to pyramidal, sturdy branching.	Purple in autumn.	Non-fruiting
Fraxinus mandshurica	v Manchurian	Mancana Ash		≤ 8.2	Mod	962	50' high, 30' wide; dense, oval crown	Rich green in summer, yellow in the autumn.	Fruiting
Fraxinus nigra	v Fallgold	Black Ash		≤ 8.2	Mod	962	50' high, 20' wide; narrow crown	Shiny green in summer, yellow in the autumn.	
Fraxinus pennsylvannica	v Cimmaron	Green Ash	4	≤ 8.2	Xeric to Mod	962	60' high, 30' wide; upright narrow to rounded	Glossy, dark green in summer, orange-red in fall	Non-fruiting. Over-used in landscape design, many pest and maintenance problems associated with this tree
Fraxinus pennsylvannica	v Marshall Seedless	Green Ash	4	≤ 8.2	Mod	1257	50' high, 40' wide; irregularly rounded	Glossy deep green in summer, yellow in fall	Non-fruiting. Over-used in landscape design, many pest and maintenance problems associated with this tree
Fraxinus pennsylvannica	v Palmore	Green Ash	4	≤ 8.2	Xeric to Mod	1257	50' high, 40' wide; symmetrical conical to rounded	Glossy deep green in summer, golden-yellow in fall	Non-fruiting. Over-used in landscape design, many pest and maintenance problems associated with this tree
Fraxinus pennsylvannica	v Summit	Green Ash	4	≤ 8.2	Xeric to Mod	1257	60' high, 40' wide; uniform oval	Dark green in summer, golden-yellow in fall	Non-fruiting. Over-used in landscape design, many pest and maintenance problems associated with this tree
Ginkgo biloba	v Autumn Gold	Ginkgo	4b	≤ 8.2	Mod	962	50' high, 35' wide; symmetrical when young.	Excellent gold fall color	Slow grower.
Ginkgo biloba	v Princeon Sentry	Ginkgo	4b	≤ 8.2	Mod	962	60' high, 25' wide; narrowly conical, upright uniform branching.	Good yellow fall color	Slow grower.
Ginkgo biloba	v Shangri-Ha	Ginkgo	4b	≤ 8.2	Mod	962	45' high, 30' wide; uniform, compact pyramidal	Good yellow fall color	Slow grower.
Gleditsia triacanthos inermis	v Imperial	Thornless Honeylocust	4a, 3b	≤ 8.2	Xeric	1257	30' - 35' high, broadly rounded, good horizontal branching angles	Dark green in summer foliage; good yellow fall color.	Essentially fruitless
Gleditsia triacanthos inermis	v Moraine	Thornless Honeylocust	3b	≤ 8.2	Xeric	962	50' high, 35' wide; vase shaped with rounded crown.	Dark green in summer; golden yellow in autumn	Essentially fruitless
Gleditsia triacanthos inermis	v Shademaster	Thornless Honeylocust	3b	≤ 8.2	Xeric	962	50' high, 35' wide; High vase-shape canopy.	Dark green in summer foliage late to turn yellow-green	Essentially fruitless
Gleditsia triacanthos inermis	v Skyline	Thornless Honeylocust	3b	≤ 8.2	Xeric	962	50' high, 35' wide; Upright, broadly pyramidal, strong central leader.	Dark green in summer foliage; good yellow fall color.	Essentially fruitless
Gleditsia triacanthos inermis	v Trueshade	Thornless Honeylocust	4a	≤ 8.2	Xeric	1257	50' high, 40' wide; pyramidal.	Dark green in summer foliage; good yellow fall color.	Essentially fruitless
Gymnocladus dioica		Kentucky Coffeetree	4a	≤ 8.2	Xeric	1256	50' high, 40' wide; sparse branching when young, oval to vase shaped, upward branching. Filtered shade.	Emerges late spring, blue green in summer and good yellow fall color.	Female has fruit litter.
Liquidambar styraciflua		Sweetgum	5b	≤ 7.5	Mod	1257	60' high, 40' wide; upright.	Green star shaped leaves in summer to yellow in autumn.	Fruit litter.
Liriodendron tulipifera		Tulip Tree	5a	≤ 8.2	Mod	1257	80' high, 40' wide; broadly pyramidal.	Green in summer to yellow in autumn. Green-yellow flowers in spring.	Large root system, can be salt sensitive.
Platanus acerifolia	v Bloodgood	London Planetree	5b	≤ 8.2	Mod	2827	70' high, 60' wide; pyramidal when young, open and spreading with age. Bark is extremely showy, mottled with cream, olive and light brown colors.	Medium to dark green in summer; yellow-brown in fall.	1' globe-shaped (syncarp), pendulous, on long stalks.

Denver Parks Recreation - 2006 Street Tree Guide

Medium/Large Trees Botanical Name	Cultivar	Common Name	Zone	Ph	Moisture <sup>1</sup>	Sq Ft of Canopy @ Maturity	General Habit	General Foliage	Management Issues
<i>Platanus occidentalis</i>		Sycamore	4b	≤ 8.2	Min to Mod	1964	70' high, 50' wide; pyramidal to rounded.	Large, green in summer to yellow in autumn.	Large root system. Fruit litter. Acorns, needs 8' wide tree lawn or more, pruning for clearance issues.
<i>Quercus acutissima</i>		Sawtooth Oak	5b	≤ 7.5	Mod	1964	50' high, 50' wide; pyramidal to spreading round.	Green in summer to yellow in autumn.	Acorns, needs 8' wide tree lawn or more, pruning for clearance issues.
<i>Quercus alba</i>		White Oak	4	≤ 7.0	Mod	1257	60' high, 40' wide; broad rounded.	New leaves emerge bright grey-green changing to dark blue-green. Purple-red in autumn.	Acorns, caterpillars.
<i>Quercus bicolor</i>		Swamp White Oak	4a	≤ 8.2	Xeric	1964	50' high, 50' wide; Broad, rounded, open typically has shorter trunk. Bark is attractive, grayish-brown, and flaky	Lustrous, leathery, dark green in summer, yellowish in the fall and sometime purple-red.	Acorns; heavy crops every 3 - 5 years
<i>Quercus coccinea</i>		Scarlet Oak	4	≤ 7.0	Mod	962	45' high, 35' wide; horizontal, rounded.	Dark green in summer to red in autumn.	Acorns
<i>Quercus imbricaria</i>		Shingle Oak	5a, 4b	≤ 7.5	Mod	1257	50' high, 40' wide; Pyramidal to upright-oval in youth, broad rounded outline with age.	Unfold reddish in spring, lustrous dark green in summer, yellow brown to russet-red in fall.	Acorns, hard to transplant, multiple pests if not maintained
<i>Quercus macrocarpa</i>		Bur Oak	3a	≤ 8.2	Xeric	2827	60' high, 60' wide; Weakly pyramidal to oval in youth, broadly rounded and open with age.	Lustrous, lustrous dark green in summer, yellow-green to yellow brown in autumn.	Acorns
<i>Quercus muhlenbergii</i>		Chinkapin Oak	5a	≤ 8.2	Mod	1590	30' - 50' high, 30' - 60' wide; round habit.	Lustrous dark yellow-green in summer, yellow to orange-brown to brown in fall.	Acorns
<i>Quercus phellos</i>		Willow Oak	5b	≤ 7.5	Min	707	40' high, 30' wide; pyramidal in youth, oval to round with age, dense crown, lower branches descending.	Light green in spring; dark green in summer; color variable in fall; brown, yellow, bronze-orange, russet-red	Acorns
<i>Quercus robur</i>		English Oak	5b	≤ 8.2	Xeric	1964	40' - 60' high, 40' - 60' wide; columnar cultivars available, but usually broadly round and oval	Foliage dark green to blue-green in summer; brown in autumn.	Acorns
<i>Quercus rubra</i>		Red Oak	3	≤ 7.5	Min to Mod	1257	60' high, 40' wide; pyramidal when young to rounded at maturity.	Dark green to bronze-wine red.	Acorns, large root system.
<i>Quercus shumardii</i>		Shumard Oak	5b, 6a	≤ 8.2	Min	1590	60' high, 45' wide; pyramidal in youth, oval to round with age.	Dark green in summer, yellow-bronze or russet-red in fall.	Acorns
<i>Sophora japonica</i>		Japanese Pagodatree	5b	≤ 8.2	Min	962	40' high, 35' wide; oval to round, upright spreading branches.	Lustrous bright green in summer, yellowish in fall, late to turn color in fall.	
<i>Tilia americana</i>	v	Redmond	3a	≤ 8.2	Mod	1256	60' high, 40' wide; densely pyramidal	Dark green in summer; green-yellow to pale yellow in the autumn. Yellow, fragrant flowers in summer.	Pruning for clearance.
<i>Tilia cordata</i>	v	Glennleaven	4a	≤ 8.2	Mod	1256	50' high, 40' wide; Pyramidal in youth, upright-oval to pyramidal-rounded with age, dense.	Dark and shiny green in summer; yellow - green to yellow in autumn. Yellow, fragrant flowers in summer.	Pruning for clearance.
<i>Tilia cordata</i>	v	Greenspire	4a	≤ 8.2	Mod	1256	50' high, 40' wide; Pyramidal in youth, upright-oval to pyramidal-rounded with age, dense.	Dark and shiny green in summer; yellow - green to yellow in autumn. Yellow, fragrant flowers in summer.	Pruning for clearance.
<i>Tilia tomentosa</i>	v	Silver Linden	4b	≤ 8.2	Mod	491	45' high, 25' wide; pyramidal to upright oval.	Dark green, silvery underneath to yellow in autumn. Yellow-white flowers in spring.	Large root system.
<i>Ulmus americana</i>	v	New Harmony	4	≤ 8.2	Mod	1964	60' high, 50' wide; broadly V-shaped	Green leaves in summer, yellow in autumn.	Winter desiccation.
<i>Ulmus americana</i>	v	Princeton	4	≤ 8.2	Mod	1257	50' high, 40' wide; upright oval	Large dark green leaves, yellow in autumn.	Winter desiccation.
<i>Ulmus americana</i>	v	Valley Forge	5	≤ 8.2	Mod	1964	60' high, 50' wide; upright vase	Green leaves in summer, yellow in autumn.	Winter desiccation.
<i>Ulmus parvifolia</i>	v	Alleé Emer il'	5	≤ 8.2	Mod	1964	60' high, 50' wide; upright, arching vase	Dark green in summer, yellow to red in autumn.	
<i>Ulmus wilsoniana</i>	v	Prospector	5	≤ 8.2	Min to Mod	491	50' high, 25' wide; vase-shaped	Large leaves emerge with red/orange tint, yellow in autumn.	
<i>Ulmus x Acolade</i>	v	Acolade Elm	3b	≤ 8.2	Mod	1257	60' high, 40' wide; upright, arching vase	Large glossy leaves. Dark green in summer, yellow in autumn.	
<i>Ulmus x Frontier</i>	v	Frontier Elm	5	≤ 8.2	Mod	707	40' high, 30' wide; upright, arching vase	Lustrous dark green in summer; yellow to red in autumn.	
<i>Zelkova serrata</i>	v	Green Vase	4	≤ 8.2	Min	1964	60' - 70' high, 40' - 60', fast growing, upright arching vase	Orange brown to bronze-red in autumn	Fruit not important; narrow crotch angles and poor branch attachments.
<i>Zelkova serrata</i>	v	Green Veil	4	≤ 8.2	Min	1964	60' - 70' high, 40' - 60', fast growing, upright arching vase	Orange-red, copper, to yellow in autumn	Fruit not important; narrow crotch angles and poor branch attachments. Not as fast growing as Halika
<i>Zelkova serrata</i>	v	Halika	5b	≤ 8.2	Min	1964	60' - 70' high, 40' - 60', fast growing, upright arching vase	Medium-dark green in summer, variable in autumn.	Fruit not important; narrow crotch angles and poor branch attachments.
<i>Zelkova serrata</i>	v	Village Green	4	≤ 8.2	Min	1964	Same as "Halika" but straighter trunk, more winter hardy	Medium-dark green in summer, variable in autumn.	Fruit not important; narrow crotch angles and poor branch attachments.

The trees in yellow shading are trees, which are in the present Street Trees brochure. The trees in white are tree species, which we feel will do fine given a larger standard design for planting vaults (6'x15'x3') or tree lawns of 8' and if maintenance is consistent, proper watering, pruning and lowering the use of sidewalk cleaners which are high in salt.

Although green ash and honeylocust are listed, we actively discourage planting of these species due to the existing high population and their associated insect and disease problems.

<sup>1</sup>Moisture requirements are based on average overall species performance after root establishment period.

Denver Parks Recreation - 2006 Street Tree Guide

Small Trees Botanical Name	Cultivar	Common Name	Zone	Ph	Moisture Level*	Canopy @ Maturity <sup>†</sup>	General Habit	General Foliage	Management Issues
Acer ginnala		Ginnala Maple	3a	≤8.2	Xeric to Min	314	15' - 25' high, 15' - 25' wide; rounded, sometimes irregular outline; multi-stemmed or single	Glossy dark green in summer; yellow, orange, red in fall.	Suckering possible; pruning to maintain outline, heavy seed crop.
Acer tataricum		Tatarian Maple	3	≤8.2	Xeric	314	15' - 25' high, 15' - 25' wide; rounded, sometimes irregular outline; multi-stemmed or single	Softer green in summer than Amur Maple; yellow autumn color.	Suckering possible; pruning to maintain outline, heavy seed crop.
Acer truncatum	v Norwegian Sunset	Shantung Maple	5a	≤8.2	Min	314	25' high, 25' wide; upright, oval, good uniform branch structure.	Glossy dark green foliage, yellow-red fall color; heat and drought tolerant.	Pruning for street use to maintain shape and structure.
Acer truncatum	v Pacific Sunset	Shantung Maple	5a	≤8.2	Min	314	25' high, 25' wide; rounded, upright spreading.	Glossy dark green foliage, yellow orange to red autumn color.	Pruning for street use to maintain shape and structure.
Aesculus glabra		Ohio Buckeye	4a	≤8.2	Mod	314	35' high, 20' wide; dense, symmetrical round.	Palmate leaf bright green in summer to yellow/orange in autumn.	Drought, heat intolerant.
Amelanchier canadensis	v Shadblow	Serviceberry	4	≤7.5	Xeric	177	20' high, 15' wide; oval, multi-stem or single	Green to dark green in summer; yellow to red in autumn.	Pruning for street use, fruit could pose a problem.
Crataegus crus-galli inermis		Thornless Cockspur Hawthorn	4a	≤8.2	Xeric	314	20' high, 20' wide; round with strongly horizontal branching.	Glossy dark green in summer, orange in fall	Pruning for street use, fruit could pose a problem.
Koelerutaria paniculata		Golden Rain Tree	5b	≤8.2	Xeric	314	30' high, 30' wide; irregular rounded, open	Purple red while emerging, bright green to blue-green in summer, yellow in autumn.	Seed pods could be a problem.
Malus spp.	v Any non-fruiting variety	Crabapples	4	≤8.2	Min to Mod	491	20' high, 25' wide; variable	Variable	Pruning for street use.
Phellodendron amurense	v Macho	Amur Corktree	4a	≤8.2	Min to Mod	314	30' high, 20' wide; broadly vase-shaped to rounded.	Glossy dark green, yellow to bronze-yellow in autumn.	Use only male cultivars, as fruit can be messy. Needs large root space.
Phellodendron amurense	v Shademaster	Amur Corktree	4a	≤8.2	Min to Mod	314	30' high, 20' wide; broadly vase-shaped to rounded.	Glossy dark green, yellow to bronze-yellow in autumn.	Use only male cultivars, as fruit can be messy. Needs large root space.
Prunus cerasifera	v Minnesota Purpleleaf	Newport Plum	5b	≤7.5	Min	177	15' high, 15' wide; round with horizontal branching	Reddish-purple	Pruning for street use.
Prunus cerasifera	v Purpleleaf	Newport Plum	5b	≤7.5	Min	113	15' high, 12' wide; rounded	Reddish-purple	Pruning for street use.
Pyrus calleryana	v Aristocrat	Callery Pear	5a	≤8.2	Mod	314	20' high, 20' wide; broadly pyramidal.	Variable autumn color.	Possible storm damage given branch angles and density; fireblight.
Pyrus calleryana	v Chanticleer	Callery Pear	5a	≤8.2	Mod	241	30' high, 15' - 20' wide; upright, narrow pyramidal.	Copper-red to red-purple in autumn.	Possible storm damage given branch angles and density; fireblight.
Pyrus calleryana	v Redspire	Callery Pear	5a	≤8.2	Mod	314	30' high, 20' wide; pyramidal to oval, dense and symmetrical.	Variable in autumn.	Possible storm damage given branch angles and density; fireblight.
Pyrus calleryana	v Whitehouse	Callery Pear	5a	≤8.2	Mod	241	20' high, 15' - 20' wide; narrow pyramidal.	Early autumn color reddish purple.	Possible storm damage given branch angles and density; fireblight.
Syringa reticulata		Japanese Tree Lilac	3a	≤7.0	Xeric to Mod	314	20' high, 15' wide; spreading rounded vase	Green leaves, no autumn color. Showy, white flowers in early summer.	Needs pruning for single trunk.

The trees in yellow shading are trees, which are in the present Street Trees brochure. The trees in white are tree species, which we feel will do the given a larger standard design for planting vaults (5'x15'x3') or tree lawns of 8' and if maintenance is consistent: proper watering, pruning and lowering the use of Small trees are to be used only when there are overhead growth restrictions, such as utility wires.  
 \*Moisture requirements are based on average overall species performance after root establishment period.

Prohibited Trees	Common Name	Management Issues
Acer negundo	Box elder	Structural issues.
Acer platanoides	Norway maple	General health and structural issues.
Acer rubrum	Red maple	General health and structural issues.
Acer saccharinum	Silver maple	General health and structural issues.
Acer x freemanii	Autumn Blaze maple	General health and structural issues.
Ailanthus altissima	Tree of Heaven	Structural issues.
Elaeagnus angustifolia	Russian olive	Invasive species and safety.
Evergreens/ornifers	Various trees.	General health, safety, and clearance issues.
Fagus sp.	Beech	Poor tree health performance.
Fleshy fruit bearing species	Various trees.	Safety and litter issues.
Multi-stemmed species	Various trees.	Structural and clearance issues.
Populus sp.	Poplars, cottonwoods, aspens	Root and structural issues.
Rhus sp.	Sumac	Invasive and safety issues.
Salix sp.	Willow	Structural and root issues.
Thorn bearing species	Various trees.	Safety issues.
Ulmus pumila	Siberian elm	General health and structural issues.

Also prohibited is any shrub or hedge growth which by its habit of growth would obstruct, restrict, or conflict with necessary and safe use of the public rights-of-way.

## EXECUTIVE ORDER NO. 87

DATE: March 2, 1993  
TO: ALL AGENCIES UNDER THE MAYOR  
FROM: MAYOR  
SUBJECT: WATER CONSERVATION

---

This Executive Order establishes the policy of the City and County of Denver as to Water Conservation.

WHEREAS, the Denver Board of Water Commissioners has recently adopted an expanded water conservation plan which provides for a variety of water saving measures, including efforts to reduce water use in the maintenance and operation of parks, open space and other public spaces and buildings; and

WHEREAS, water conservation represents responsible public policy in connection with the management of a scarce natural resource in a semi-arid region; and

WHEREAS, water conservation can result in additional water supplies to supplement Denver's reserves and defer the need for more costly sources of supply by reducing water demand; and

WHEREAS, the most cost-effective manner in which to conserve water in public spaces and buildings is to integrate conservation considerations in the planning and design of new construction or major modifications of public buildings and landscaping;

It is therefore ordered:

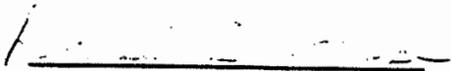
1. That the Manager of the Department of Parks and Recreation, the Manager of the Department of Public Works, and the Manager of the Department of General Services for the City and County of Denver shall coordinate with all affected City agencies in the planning of new buildings or landscaped areas or major modifications of plumbing systems or landscaped areas by seeking advice on water conservation techniques including, but not limited to, low water use appliances and plumbing devices, selection of landscape materials, soil preparation and landscape irrigation techniques. Planning of these areas and facilities shall be sensitive to and consistent with the urban design concepts and objectives of Denver's history and urban form, the integrity of its parks and open space system, and the significance of the settings of major public buildings and facilities in keeping with the Denver 1989 Comprehensive Plan.
2. That a representative group of personnel from affected departments and agencies of the City and County of Denver be convened by the Manager of the Department of Parks and Recreation, the Manager of the Department of Public Works, the Director of Planning and Community Development, and the Manager of the Department of General Services, to work with Denver Water to review and update, as necessary, the guidelines regarding the planning and design of public buildings and landscapes with respect to water use. The Denver Landmark Preservation Commission shall be consulted when guideline changes that may affect historic landscapes are being considered. See the Denver Landscape Design and Maintenance Guidelines.
3. That as part of these guidelines, minor and major projects shall be defined as follows: A major project includes new parks or projects including landscape and irrigation projects in existing park renovation projects over one acre. A minor project includes renovation on projects under one acre and projects that don't include landscape and irrigation modification.
4. That for all minor projects, the appropriate Department Manager, Agency Director or his/her designee shall certify to the Denver Water Department that the project meets the guidelines.

5. That for all major projects, all plans shall be reviewed in a timely fashion for water conservation considerations by the Manager of Denver Water prior to any contracts being let for construction. The Manager of Denver Water will provide written comments on the plans for each major project submitted for review to the appropriate Department Manager or Agency Director, with a copy provided to the Mayor's Environmental Issues Coordinator within ten working days of receipt of the project plans.
6. ~~This order presumes that the guidelines shall be incorporated in project plans.~~ Suggestions deemed inappropriate by the responsible agency shall be negotiated between departments. Summaries of these issues, and of their proposed resolution, shall be provided to the Mayor's Environmental Issues Coordinator or her designee. The proposed resolution shall be implemented unless the Environmental Issues Coordinator advises otherwise within five working days.
7. That the Mayor's Environmental Issues Coordinator, the Manager of the Department of Parks and Recreation, the Manager of the Department of Public Works, the Director of Planning and Community Development, and the Manager of the Department of General Services, and other appropriate officials of the City and County of Denver, in cooperation with Denver Water, shall evaluate areas of potential water savings including, but not limited to, retrofitting existing buildings with low water use fixtures, and improving irrigation system efficiencies, renovating large open spaces to encourage reduced water use, and developing alternative water sources, such as retention and use of storm runoff, grey water utilization and well systems.
8. That strategies for accomplishing water conservation improvements be developed under the direction of the Mayor's Environmental Issues Coordinator, Manager of Parks and Recreation, the Manager of the Department of Public Works, the Director of Planning and Community Development, and the Manager of the Department of General Services, that include those alternatives identified as feasible and desirable. These activities shall include an annual review and update of this Executive Order.

March 2, 1993

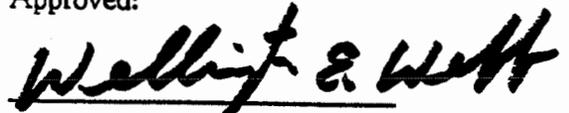
9. That the Mayor's Office shall work with all affected departments and agencies of the City and County of Denver and Denver Water to ensure the effective and timely implementation of this order.

Approved for Legality:



Attorney for the City and County of Denver

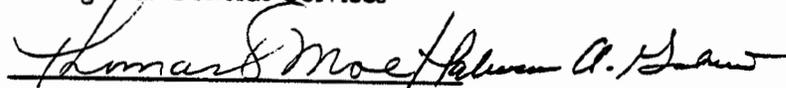
Approved:



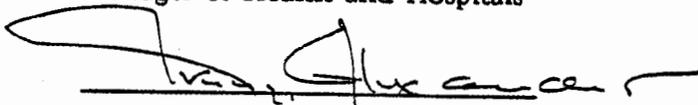
Wellington E. Webb, Mayor



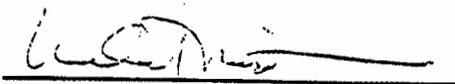
Manager of General Services



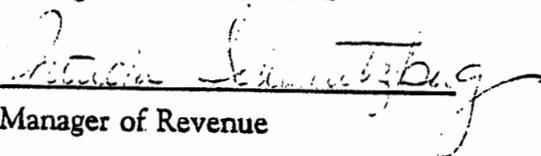
Manager of Health and Hospitals



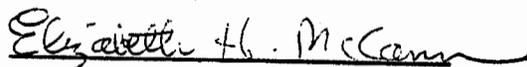
Manager of Parks and Recreation



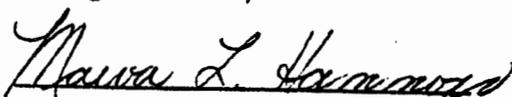
Manager of Public Works



Manager of Revenue



Manager of Safety



Manager of Social Services







**BALLFIELD PRESSBOX PROTOTYPE**

CITY AND COUNTY OF DENVER  
PLANNING AND DEVELOPMENT  
DENVER, COLORADO

CONSTRUCTION DOCUMENTS



1605 SOUTH STREET  
DENVER, COLORADO 80202  
303.733.9555

STRUCTURAL ENGINEER  
BREBRACH CONSULTING  
1300 W. 5TH AVENUE  
LAKEWOOD, COLORADO 80114

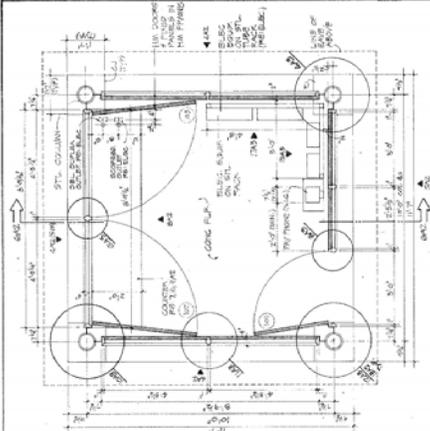
REGISTERED ARCHITECT  
DAVID M. BAIN & ASSOCIATES  
1000 CO. PARKER ROAD  
DENVER, COLORADO 80231  
303.733.1015

NOTES: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

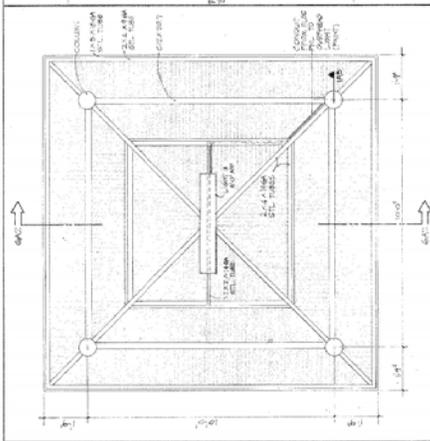
DATE: 03/28/2014

PROJECT NUMBER: A2-2

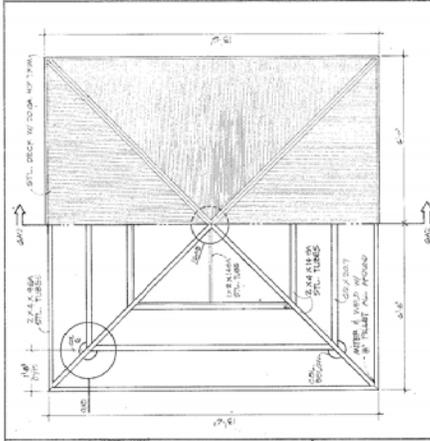
DATE OF SHEET: 28 MARCH 1994



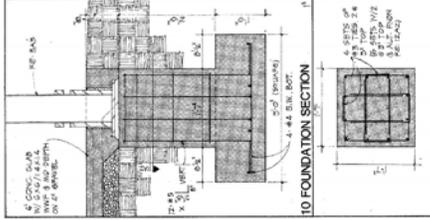
1 FLOOR PLAN 1/8"



2 REFLECTED CEILING PLAN 1/8"



3 ROOF/FRAMING PLAN 3/8"



10 FOUNDATION SECTION

NOTE: THIS DETAIL SHALL BE CONSIDERED AS A PART OF THE FOUNDATION DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

11 FOUNDATION PLAN: Architectural drawing showing the foundation layout with dimensions and structural notes.

11 FOUNDATION PLAN

NOTE: THIS DETAIL SHALL BE CONSIDERED AS A PART OF THE FOUNDATION DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

12 ALTERNATIVE FOUNDATION SECTION: Cross-section drawing of an alternative foundation design showing concrete and soil details.

12 ALTERNATIVE FOUNDATION SECTION

NOTE: THIS DETAIL SHALL BE CONSIDERED AS A PART OF THE FOUNDATION DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

13 SLAB CORNER REIN. DETAIL: Reinforcement detail drawing for the slab corner showing steel bars and concrete dimensions.

13 SLAB CORNER REIN. DETAIL

NOTE: THIS DETAIL SHALL BE CONSIDERED AS A PART OF THE FOUNDATION DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

14 SIDE ELEVATIONS (FRONT ELEVATION SIMILAR): Architectural drawing showing the side elevations of the structure with dimensions and material notes.

14 SIDE ELEVATIONS (FRONT ELEVATION SIMILAR) 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

15 REAR ELEVATION: Architectural drawing showing the rear elevation of the structure with dimensions and material notes.

15 REAR ELEVATION 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

16 COUNTER FRAME PLAN: Architectural drawing showing the counter frame plan with dimensions and material notes.

16 COUNTER FRAME PLAN 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

17 COUNTER FRAME ELEVATION: Architectural drawing showing the counter frame elevation with dimensions and material notes.

17 COUNTER FRAME ELEVATION 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

18 COUNTER FRAME ELEVATION: Architectural drawing showing the counter frame elevation with dimensions and material notes.

18 COUNTER FRAME ELEVATION 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

19 COUNTER SECTION: Cross-section drawing of the counter showing structural details and dimensions.

19 COUNTER SECTION 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

20 BUILDING SECTION: Cross-section drawing of the building showing structural details and dimensions.

20 BUILDING SECTION 1/8"

NOTE: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF ALL MATERIALS AND COMPONENTS AT THE TIME OF INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.



**BALLFIELD PRESSBOX PROTOTYPE**

CITY AND COUNTY OF DENVER  
DEPARTMENT OF UTILITIES  
DENVER, COLORADO

**CONSTRUCTION DOCUMENTS**

**J.P. Architecture**  
Architectural  
Planning  
Design  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**STRUCTURAL ENGINEER**  
BERNARD CONRADT ENR  
3737 W. 6TH AVENUE  
SUITE 200  
DENVER, CO 80202

**ELECTRICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

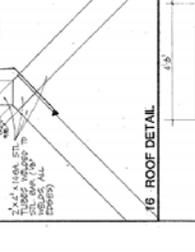
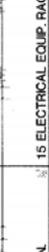
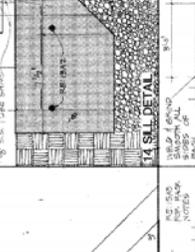
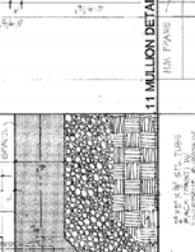
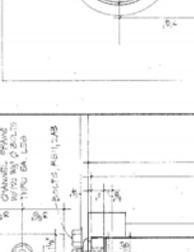
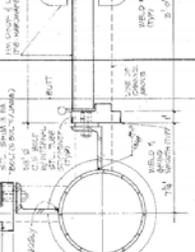
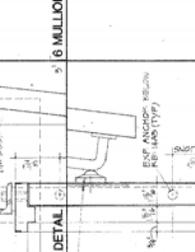
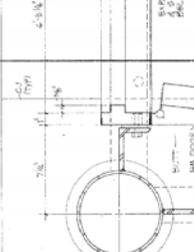
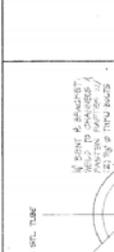
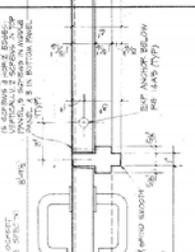
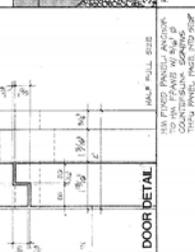
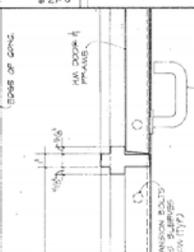
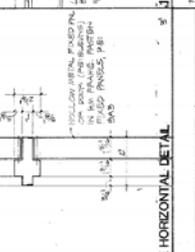
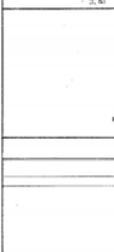
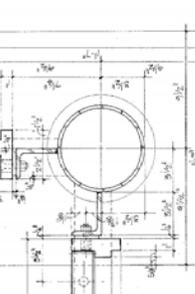
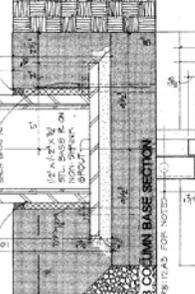
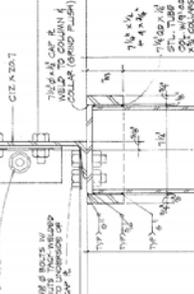
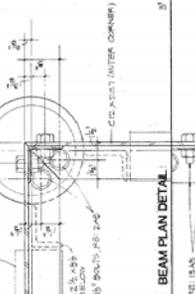
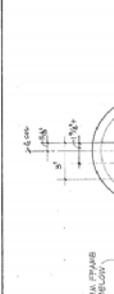
**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999

**MECHANICAL ENGINEER**  
DAVID M. KAZIM & ASSOCIATES  
1000 17th Street  
Suite 600  
Denver, Colorado 80202  
303.733.9999







**KIOSKS:  
VARIOUS  
PARKS**

CITY AND COUNTY  
OF DENVER  
DEPARTMENT OF  
PUBLIC WORKS  
DENVER, COLORADO

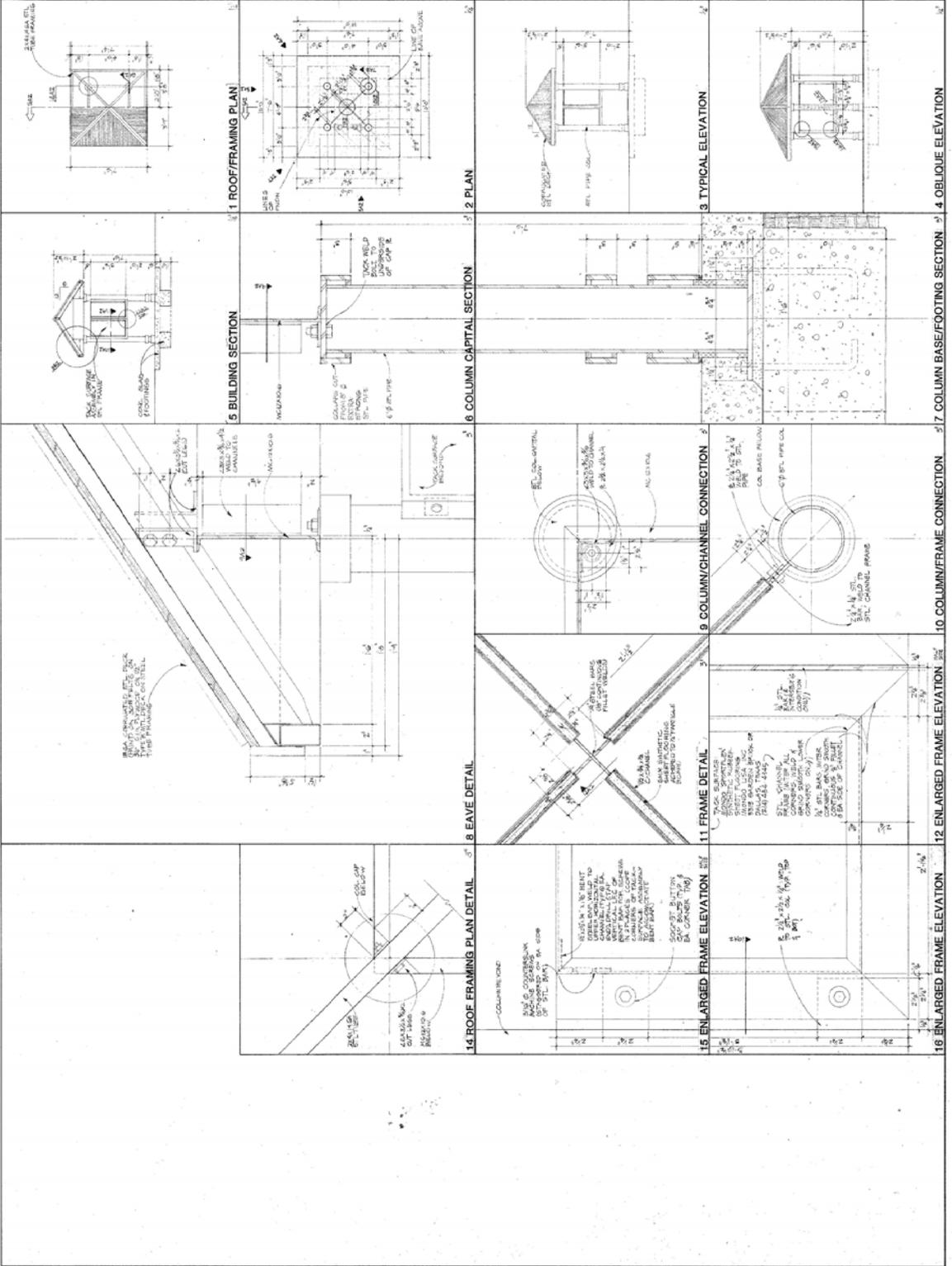
**DESIGN  
DEVELOPMENT**

**JP** Architecture  
Interior Design  
Planning  
1400 WEST STREET  
SUITE 302  
DENVER, COLORADO 80202  
(303) 437-7600

STRUCTURAL ENGINEER  
**BERNARD CONRAD INC**  
DENVER, CO  
1445 KODOLAK BLVD  
LAKEWOOD, COLORADO 80204  
(303) 232-3888

BLANK ELEVATIONAL  
SECTION DETAILS

DATE: 24 APRIL 1995  
SHEET NO. **A2**









**PICNIC SHELTER PROTOTYPES**

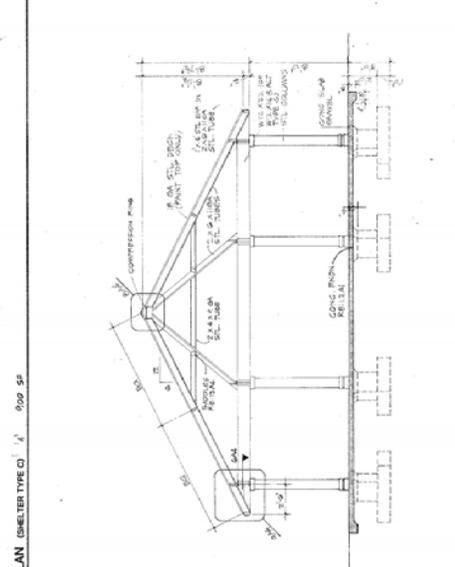
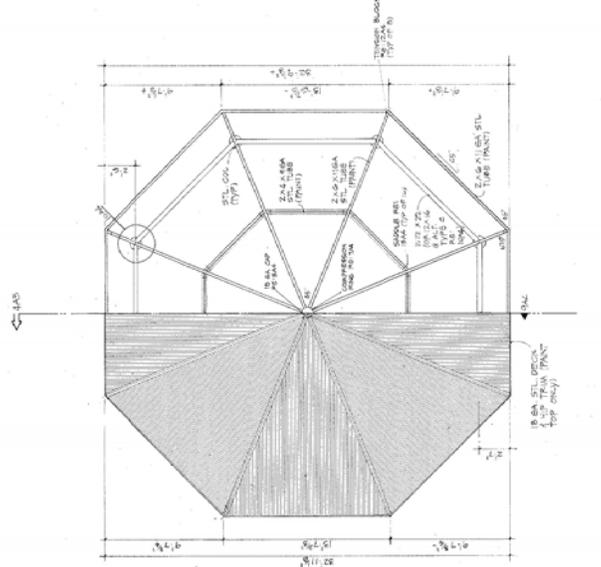
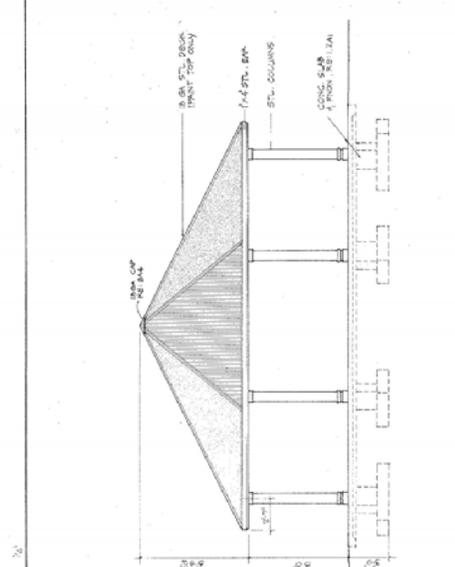
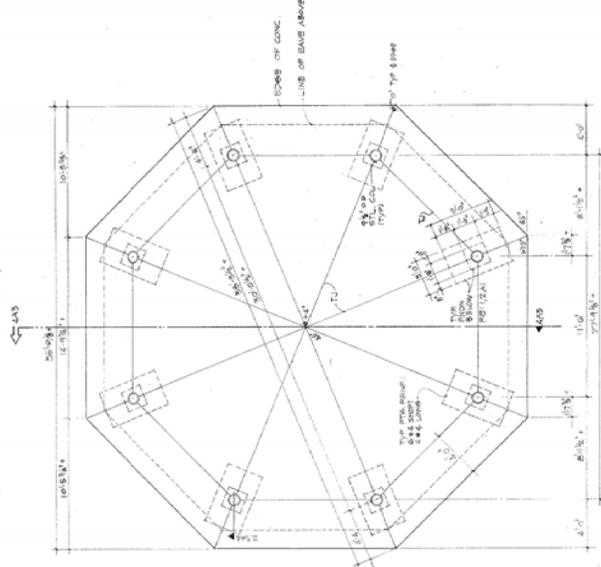
CITY AND COUNTY OF DENVER  
DEPARTMENT OF CREATION  
DENVER, COLORADO

TYPE C-4-S TABLE  
CONSTRUCTION DOCUMENTS

**JH** Architecture  
Design  
Planning

STRUCTURAL ENGINEER  
DENVER, COLORADO 80202  
5707 W. 6TH AVENUE  
DENVER, COLORADO 80214  
303.733.8538

REVISIONS	NO.	DATE	DESCRIPTION
1	001	12/15/82	ISSUE FOR CONSTRUCTION
2	002	01/15/83	REVISED FOR CONSTRUCTION
3	003	02/15/83	REVISED FOR CONSTRUCTION
4	004	03/15/83	REVISED FOR CONSTRUCTION
5	005	04/15/83	REVISED FOR CONSTRUCTION
6	006	05/15/83	REVISED FOR CONSTRUCTION
7	007	06/15/83	REVISED FOR CONSTRUCTION
8	008	07/15/83	REVISED FOR CONSTRUCTION
9	009	08/15/83	REVISED FOR CONSTRUCTION
10	010	09/15/83	REVISED FOR CONSTRUCTION
11	011	10/15/83	REVISED FOR CONSTRUCTION
12	012	11/15/83	REVISED FOR CONSTRUCTION
13	013	12/15/83	REVISED FOR CONSTRUCTION
14	014	01/15/84	REVISED FOR CONSTRUCTION
15	015	02/15/84	REVISED FOR CONSTRUCTION
16	016	03/15/84	REVISED FOR CONSTRUCTION
17	017	04/15/84	REVISED FOR CONSTRUCTION
18	018	05/15/84	REVISED FOR CONSTRUCTION
19	019	06/15/84	REVISED FOR CONSTRUCTION
20	020	07/15/84	REVISED FOR CONSTRUCTION
21	021	08/15/84	REVISED FOR CONSTRUCTION
22	022	09/15/84	REVISED FOR CONSTRUCTION
23	023	10/15/84	REVISED FOR CONSTRUCTION
24	024	11/15/84	REVISED FOR CONSTRUCTION
25	025	12/15/84	REVISED FOR CONSTRUCTION
26	026	01/15/85	REVISED FOR CONSTRUCTION
27	027	02/15/85	REVISED FOR CONSTRUCTION
28	028	03/15/85	REVISED FOR CONSTRUCTION
29	029	04/15/85	REVISED FOR CONSTRUCTION
30	030	05/15/85	REVISED FOR CONSTRUCTION
31	031	06/15/85	REVISED FOR CONSTRUCTION
32	032	07/15/85	REVISED FOR CONSTRUCTION
33	033	08/15/85	REVISED FOR CONSTRUCTION
34	034	09/15/85	REVISED FOR CONSTRUCTION
35	035	10/15/85	REVISED FOR CONSTRUCTION
36	036	11/15/85	REVISED FOR CONSTRUCTION
37	037	12/15/85	REVISED FOR CONSTRUCTION
38	038	01/15/86	REVISED FOR CONSTRUCTION
39	039	02/15/86	REVISED FOR CONSTRUCTION
40	040	03/15/86	REVISED FOR CONSTRUCTION
41	041	04/15/86	REVISED FOR CONSTRUCTION
42	042	05/15/86	REVISED FOR CONSTRUCTION
43	043	06/15/86	REVISED FOR CONSTRUCTION
44	044	07/15/86	REVISED FOR CONSTRUCTION
45	045	08/15/86	REVISED FOR CONSTRUCTION
46	046	09/15/86	REVISED FOR CONSTRUCTION
47	047	10/15/86	REVISED FOR CONSTRUCTION
48	048	11/15/86	REVISED FOR CONSTRUCTION
49	049	12/15/86	REVISED FOR CONSTRUCTION
50	050	01/15/87	REVISED FOR CONSTRUCTION
51	051	02/15/87	REVISED FOR CONSTRUCTION
52	052	03/15/87	REVISED FOR CONSTRUCTION
53	053	04/15/87	REVISED FOR CONSTRUCTION
54	054	05/15/87	REVISED FOR CONSTRUCTION
55	055	06/15/87	REVISED FOR CONSTRUCTION
56	056	07/15/87	REVISED FOR CONSTRUCTION
57	057	08/15/87	REVISED FOR CONSTRUCTION
58	058	09/15/87	REVISED FOR CONSTRUCTION
59	059	10/15/87	REVISED FOR CONSTRUCTION
60	060	11/15/87	REVISED FOR CONSTRUCTION
61	061	12/15/87	REVISED FOR CONSTRUCTION
62	062	01/15/88	REVISED FOR CONSTRUCTION
63	063	02/15/88	REVISED FOR CONSTRUCTION
64	064	03/15/88	REVISED FOR CONSTRUCTION
65	065	04/15/88	REVISED FOR CONSTRUCTION
66	066	05/15/88	REVISED FOR CONSTRUCTION
67	067	06/15/88	REVISED FOR CONSTRUCTION
68	068	07/15/88	REVISED FOR CONSTRUCTION
69	069	08/15/88	REVISED FOR CONSTRUCTION
70	070	09/15/88	REVISED FOR CONSTRUCTION
71	071	10/15/88	REVISED FOR CONSTRUCTION
72	072	11/15/88	REVISED FOR CONSTRUCTION
73	073	12/15/88	REVISED FOR CONSTRUCTION
74	074	01/15/89	REVISED FOR CONSTRUCTION
75	075	02/15/89	REVISED FOR CONSTRUCTION
76	076	03/15/89	REVISED FOR CONSTRUCTION
77	077	04/15/89	REVISED FOR CONSTRUCTION
78	078	05/15/89	REVISED FOR CONSTRUCTION
79	079	06/15/89	REVISED FOR CONSTRUCTION
80	080	07/15/89	REVISED FOR CONSTRUCTION
81	081	08/15/89	REVISED FOR CONSTRUCTION
82	082	09/15/89	REVISED FOR CONSTRUCTION
83	083	10/15/89	REVISED FOR CONSTRUCTION
84	084	11/15/89	REVISED FOR CONSTRUCTION
85	085	12/15/89	REVISED FOR CONSTRUCTION
86	086	01/15/90	REVISED FOR CONSTRUCTION
87	087	02/15/90	REVISED FOR CONSTRUCTION
88	088	03/15/90	REVISED FOR CONSTRUCTION
89	089	04/15/90	REVISED FOR CONSTRUCTION
90	090	05/15/90	REVISED FOR CONSTRUCTION
91	091	06/15/90	REVISED FOR CONSTRUCTION
92	092	07/15/90	REVISED FOR CONSTRUCTION
93	093	08/15/90	REVISED FOR CONSTRUCTION
94	094	09/15/90	REVISED FOR CONSTRUCTION
95	095	10/15/90	REVISED FOR CONSTRUCTION
96	096	11/15/90	REVISED FOR CONSTRUCTION
97	097	12/15/90	REVISED FOR CONSTRUCTION
98	098	01/15/91	REVISED FOR CONSTRUCTION
99	099	02/15/91	REVISED FOR CONSTRUCTION
100	100	03/15/91	REVISED FOR CONSTRUCTION



1 PLAN (SHELTER TYPE C) 900 SF  
2 ELEVATION (SHELTER TYPE C)

3 ROOF/FRAMING PLAN (SHELTER TYPE C) 900 SF  
4 SECTION (SHELTER TYPE C)



PICNIC SHELTER PROTOTYPES

CITY AND COUNTY DEPARTMENT OF ENVIRONMENT AND CONSERVATION DENVER, COLORADO

TYPE A-3 TABLE TYPE B-3 TABLE TYPE C-4-9 TABLE

CONSTRUCTION DOCUMENTS

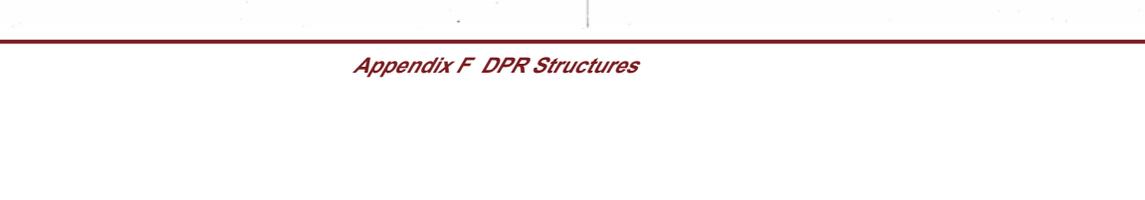
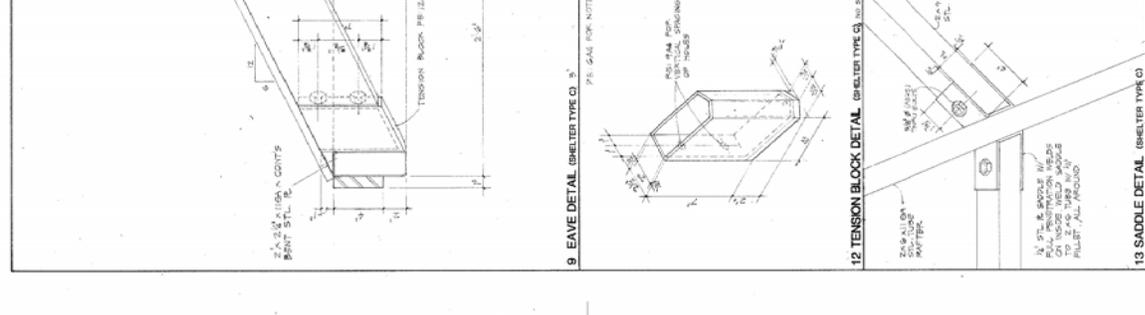
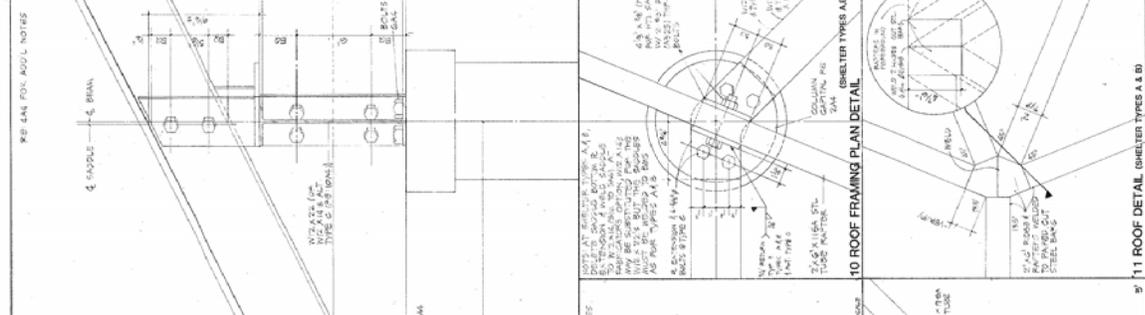
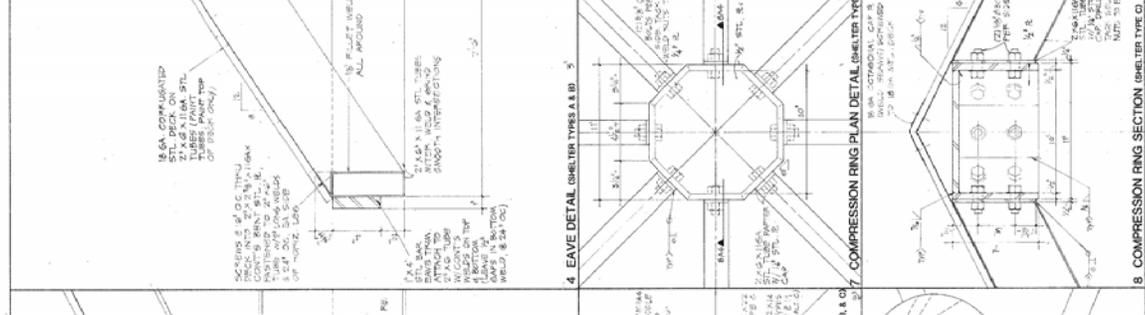
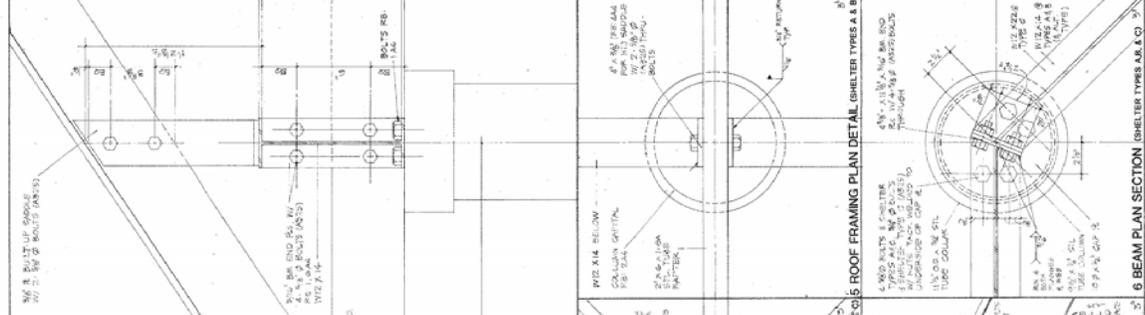
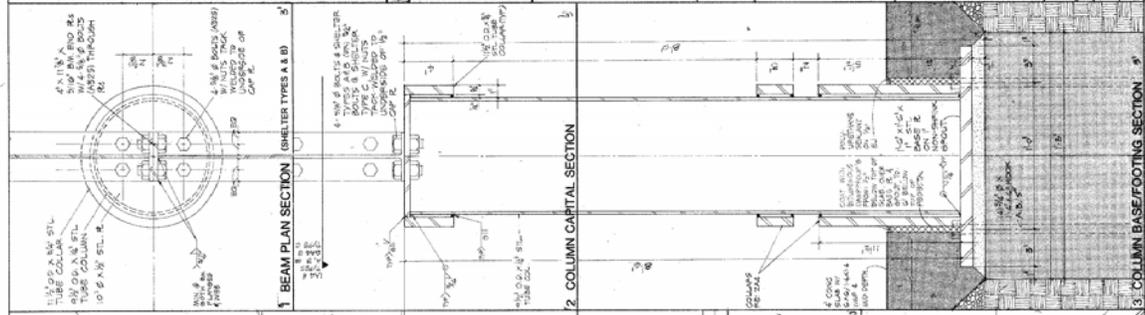
JH Architecture Interior Design Planning 1605 1700 STREET DENVER, COLORADO 80202

STRUCTURAL ENGINEER BUILDINGS CONSULTING 5707 W. 6TH AVENUE DENVER, COLORADO 80214

DATE: 1 AUG 88 BY: BJC

Table with columns for sheet number, title, and date. Includes sheet A1-4 dated 30 MARCH 1984.

DETAILS: SHELTER TYPES A, B, AND C





**TOILET ENCLOSURE PROTOTYPES WITH ADAPTATION FOR BUS SHELTERS**

CITY AND COUNTY OF DENVER  
DEPARTMENT OF  
PARKS AND RECREATION  
DENVER, COLORADO

SINGLE TOILET ENCLOSURE  
DOUBLE TOILET ENCLOSURE  
BUS SHELTER

**JP**  
Architecture  
Design  
Planning  
444 STAM STREET  
SUITE 400  
DENVER, COLORADO 80202  
303.733.1838

CONTRACT NUMBER  
SERIAL NUMBER  
DATE OF ISSUE  
DATE OF REVISION  
DATE OF CANCELLATION  
DATE OF CANCELLATION  
DATE OF CANCELLATION

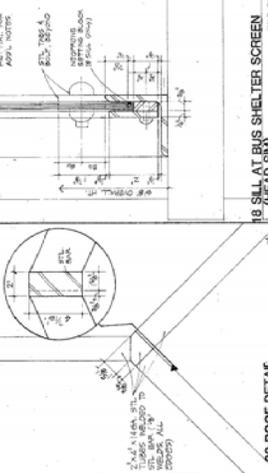
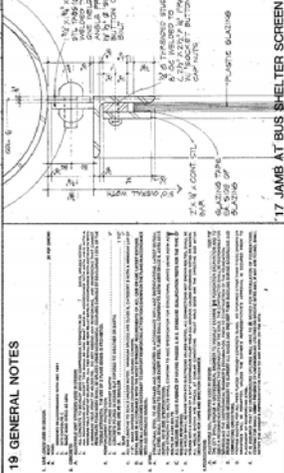
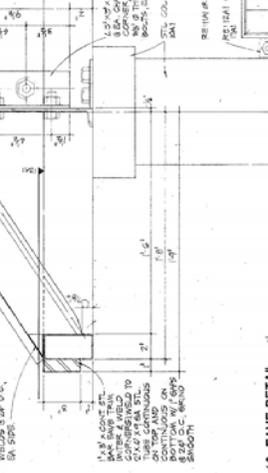
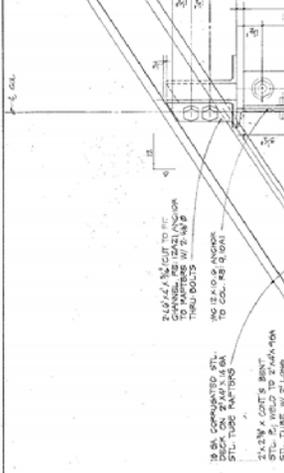
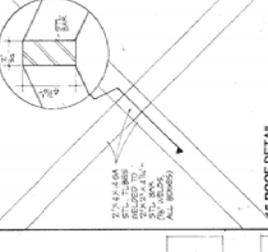
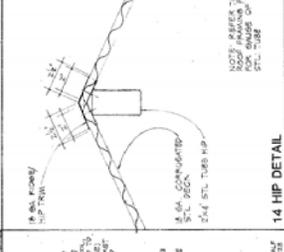
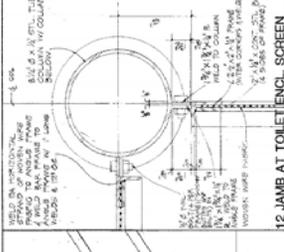
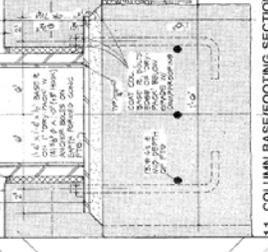
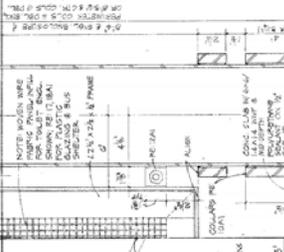
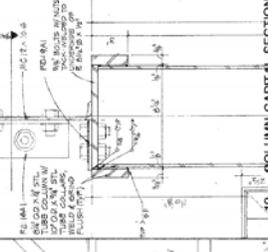
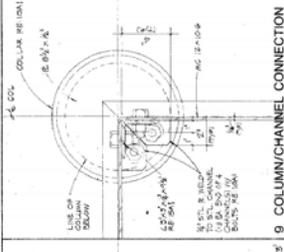
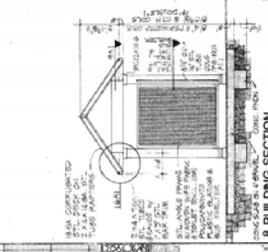
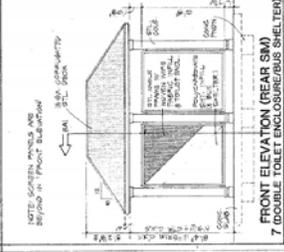
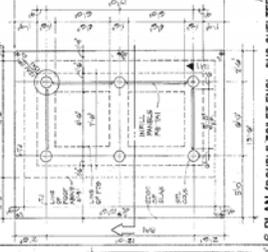
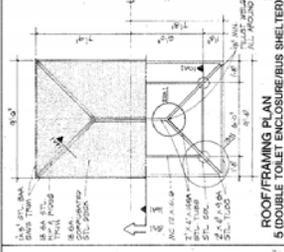
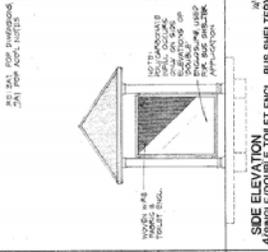
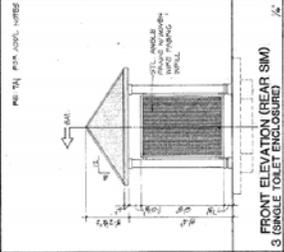
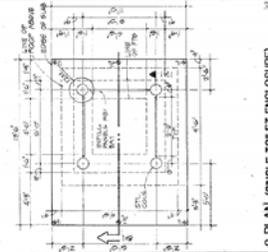
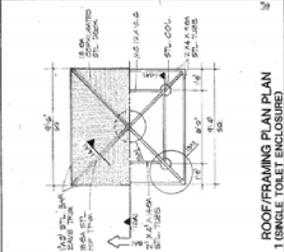
NOTE: THE DRAWING CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF THE EXISTING STRUCTURE AND MATERIALS AT THE SITE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY AND COUNTY OF DENVER.

DATE: 2 MARCH 1994

SCALE: AS SHOWN

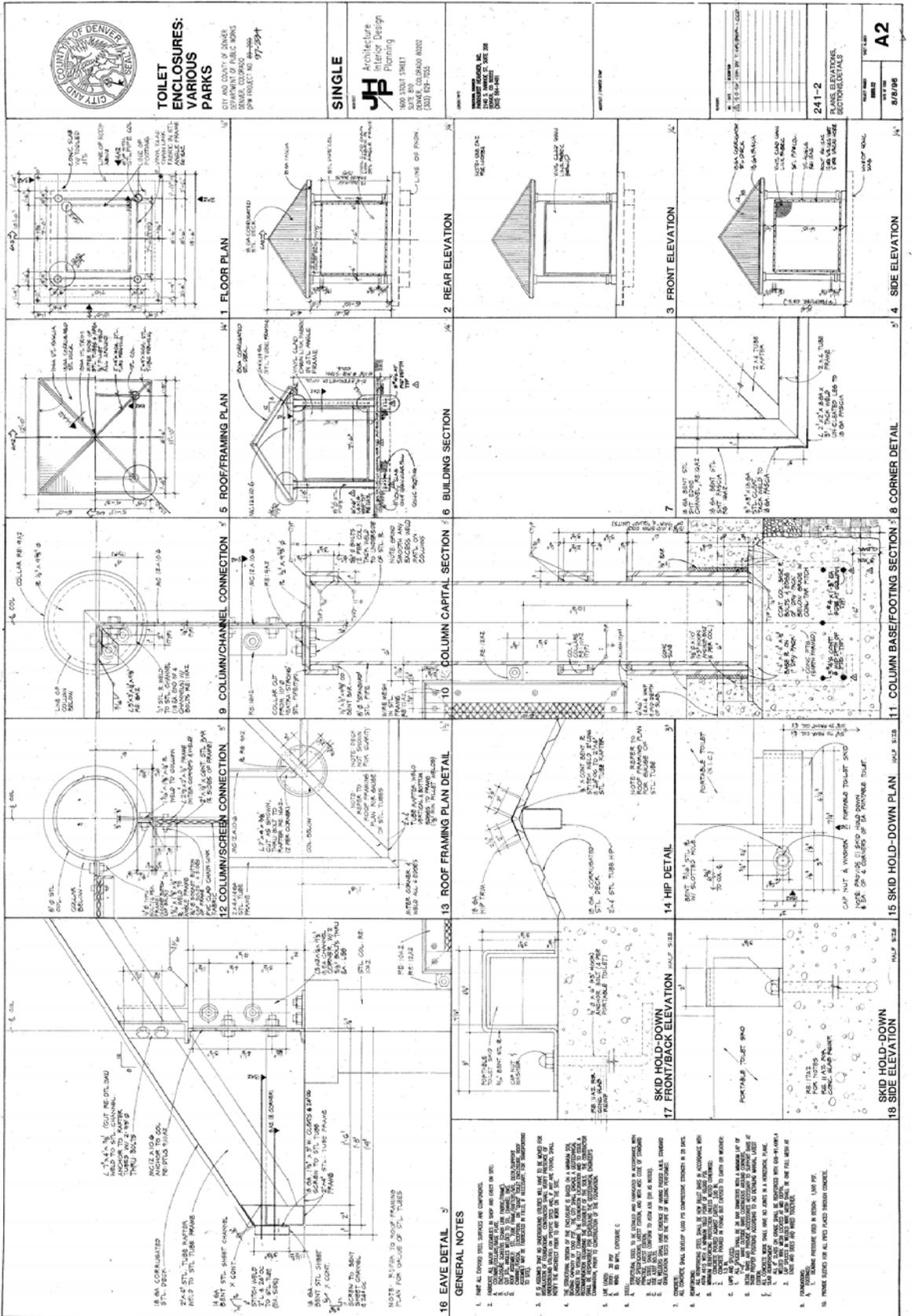
SECTION DETAILS

**A1**

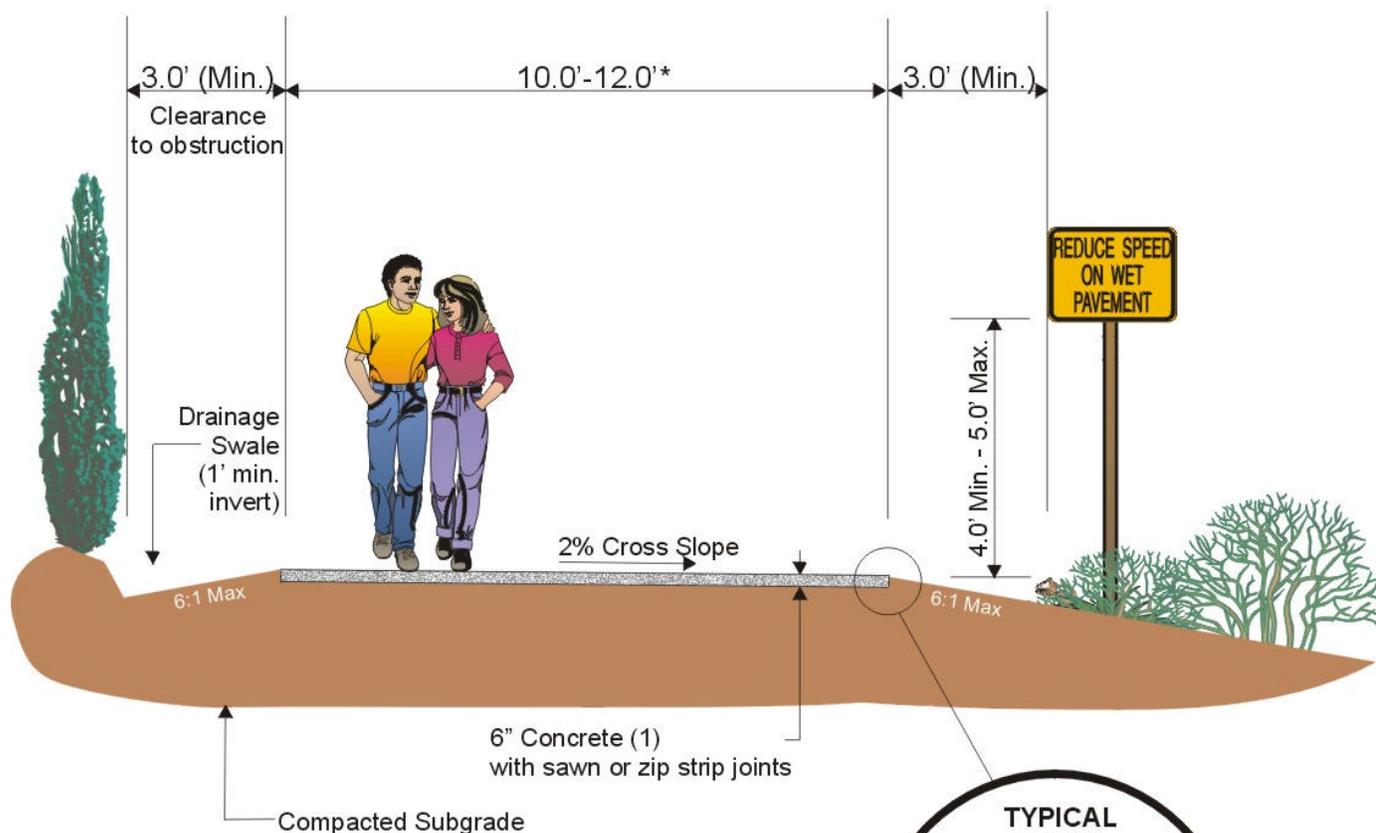


**16 GENERAL NOTES**

1. ALL DIMENSIONS ARE IN FEET AND INCHES.
2. ALL MATERIALS SHALL BE AS SHOWN OR APPROVED BY THE ARCHITECT.
3. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
9. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
10. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
11. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
12. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
13. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
14. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
15. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
16. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
17. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
18. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
19. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.
20. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY AND COUNTY OF DENVER SPECIFICATIONS.



# Regional Path Typical Section



## (1) Concrete Specifications for Cast In Place Concrete Trail

Concrete Class.....	A or B
Minimum 28 Day Compressive Strength (field).....	4000 psi
Minimum Cementitious Materials Contents.....	610 lb./C.Y.
Air Content.....	5-8%
Maximum Water/Cement Ratio.....	0.45
Maximum Slump (Hand Placement).....	4"
Maximum Slump (Machine Placement).....	3"
Coarse Aggregate (Size No.) (Machine Placement).....	.467 or 357
Coarse Aggregate (Size No.) (Hand Placement).....	57 or 67
Fine Aggregate (Maximum % of Total Aggregate).....	45%
* Total percent of fly ash allowable by weight of cement plus fly ash.....	20%
* Fly ash may Class C or Class F	
Fibrous reinforcement.....	1.5 lbs./C.Y.

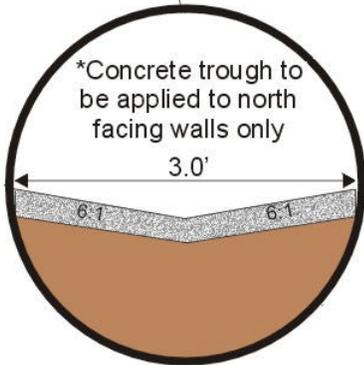
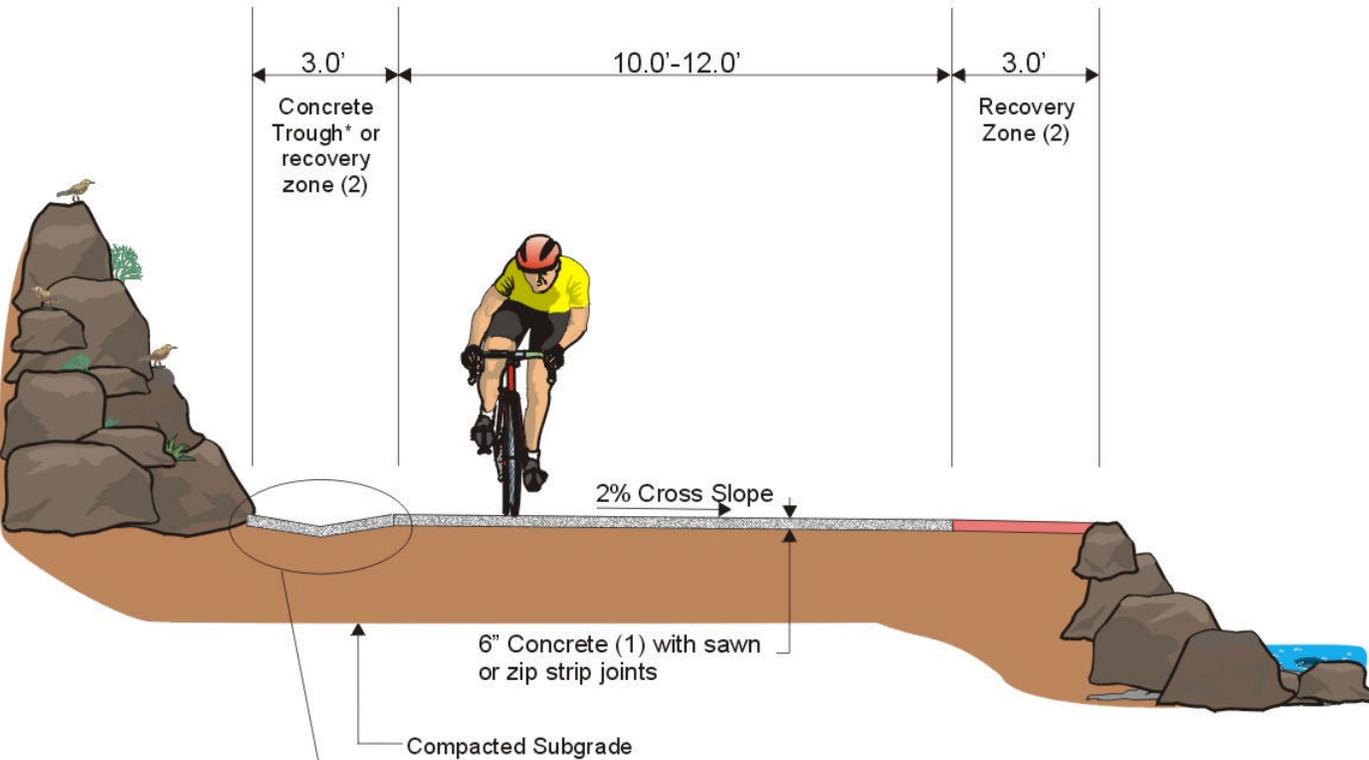
Fibrous reinforcement to be 100% virgin polypropylene fibrillated fibers containing no olefin materials.

Platte River Trail Concrete shall be tinted Davis Dye Color 5084 (Omaha Tan) or approved equal, at an addition rate of one pound per bag of Type I-II Portland Cement.

\* Path width shall be 12' along Platte River from I-25 north to City of Cuernavaca Park and along Cherry Creek.

**NOTE: ALL WORK SHALL BE ADA COMPLIANT**

# Regional Path With Recovery Zone Typical Section



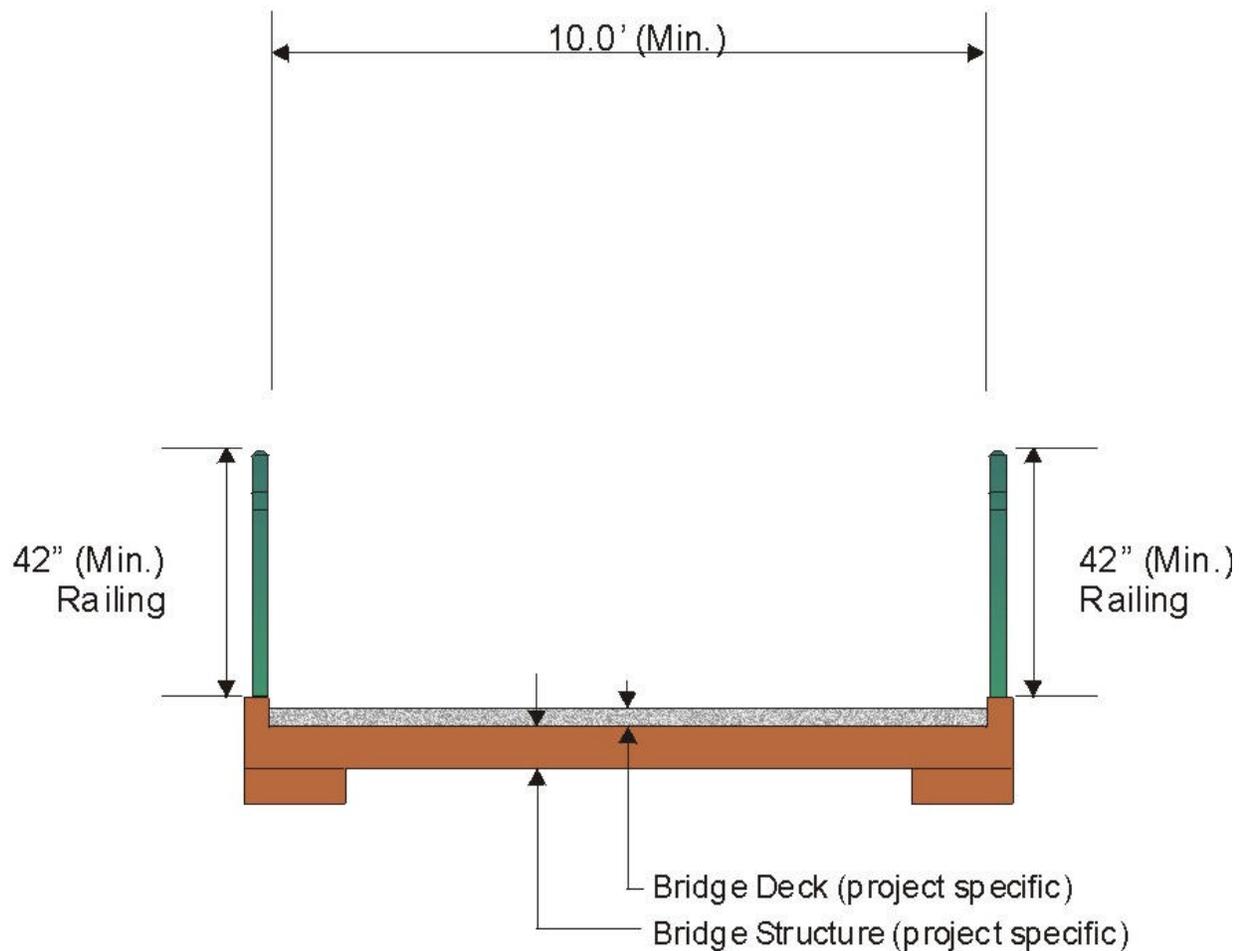
## (1) Concrete Specifications for Cast In Place Concrete Trail

Concrete Class.....	A or B
Minimum 28 Day Compressive Strength (field).....	4000 psi
Minimum Cementitious Materials Contents.....	610 lb /C. Y.
Air Content.....	5-8%
Maximum Water/Cement Ratio.....	0.45
Maximum Slump (Hand Placement).....	4"
Maximum Slump (Machine Placement).....	3"
Coarse Aggregate (Size No.) (Machine Placement).....	467 or 357
Coarse Aggregate (Size No.) (Hand Placement).....	57 or 67
Fine Aggregate (Maximum % of Total Aggregate).....	45%
* Total percent of fly ash allowable by weight of cement plus fly ash.....	20%
* Fly ash may Class C or Class F	
Fibrous reinforcement.....	1.5 lbs./C.Y.

Fibrous reinforcement to be 100% virgin polypropylene fibrillated fibers containing no olefin materials.

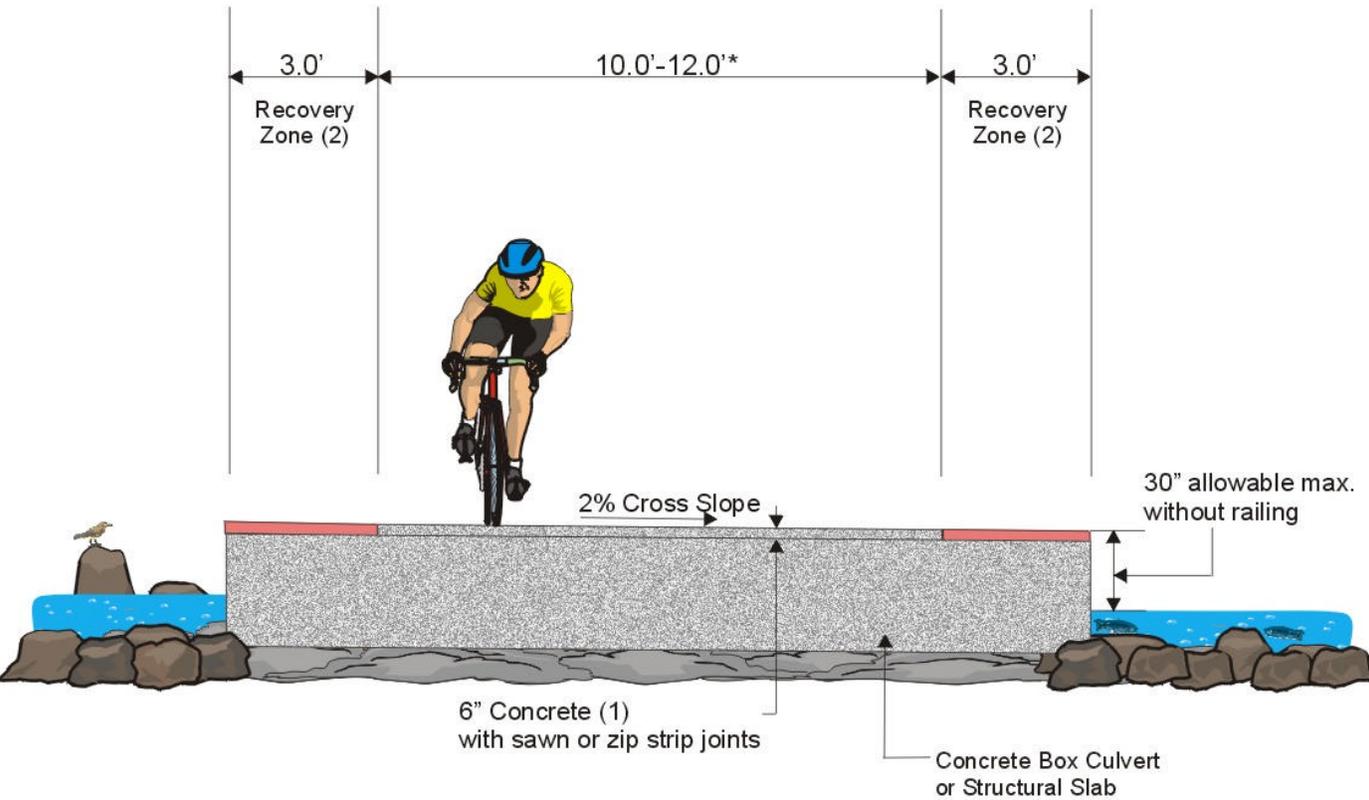
(2) Recovery zones shall be tinted Davis Dye color 1117 (Tile Red) at a rate of three pounds per bag of Type I-II Portland Cement. Recovery zones shall be scored to 3/8" depth at 12" on centers.

# ***Two-Way Path -- Bridge Typical Section***



Project specific design loading (AASHTO H5 loading min.)

# Two-Way Path -- Low Water Crossing Typical Section



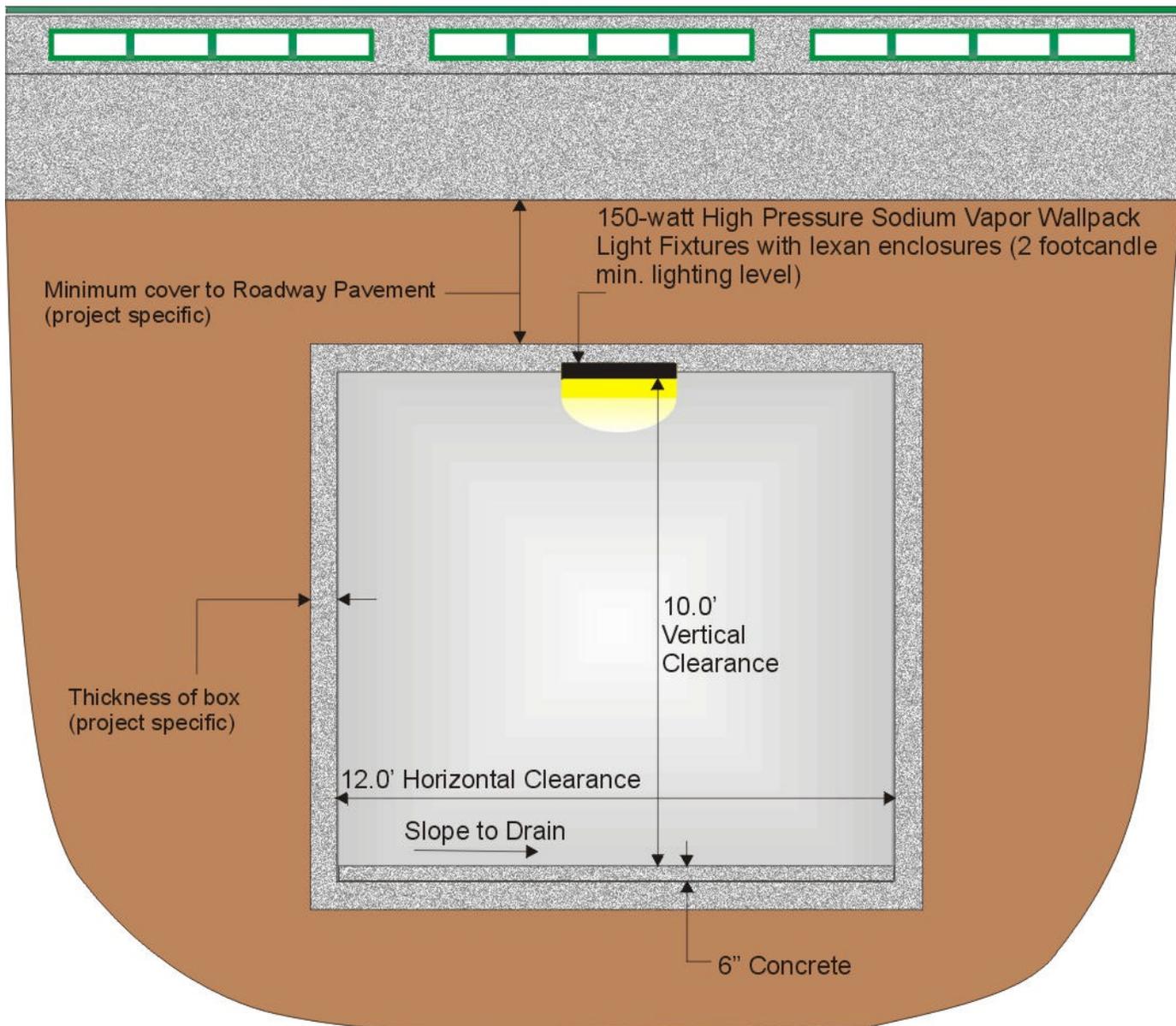
### (1) Concrete Specifications for Cast In Place Concrete Trail

Concrete Class.....	A or B
Minimum 28 Day Compressive Strength (field).....	4000 psi
Minimum Cementitious Materials Contents.....	610 lb./C.Y.
Air Content.....	5-8%
Maximum Water/Cement Ratio.....	0.45
Maximum Slump (Hand Placement).....	4"
Maximum Slump (Machine Placement).....	3"
Coarse Aggregate (Size No.) (Machine Placement).....	.467 or 357
Coarse Aggregate (Size No.) (Hand Placement).....	57 or 67
Fine Aggregate (Maximum % of Total Aggregate).....	45%
* Total percent of fly ash allowable by weight of cement plus fly ash.....	20%
* Fly ash may Class C or Class F	
Fibrous reinforcement.....	1.5 lbs./C.Y.

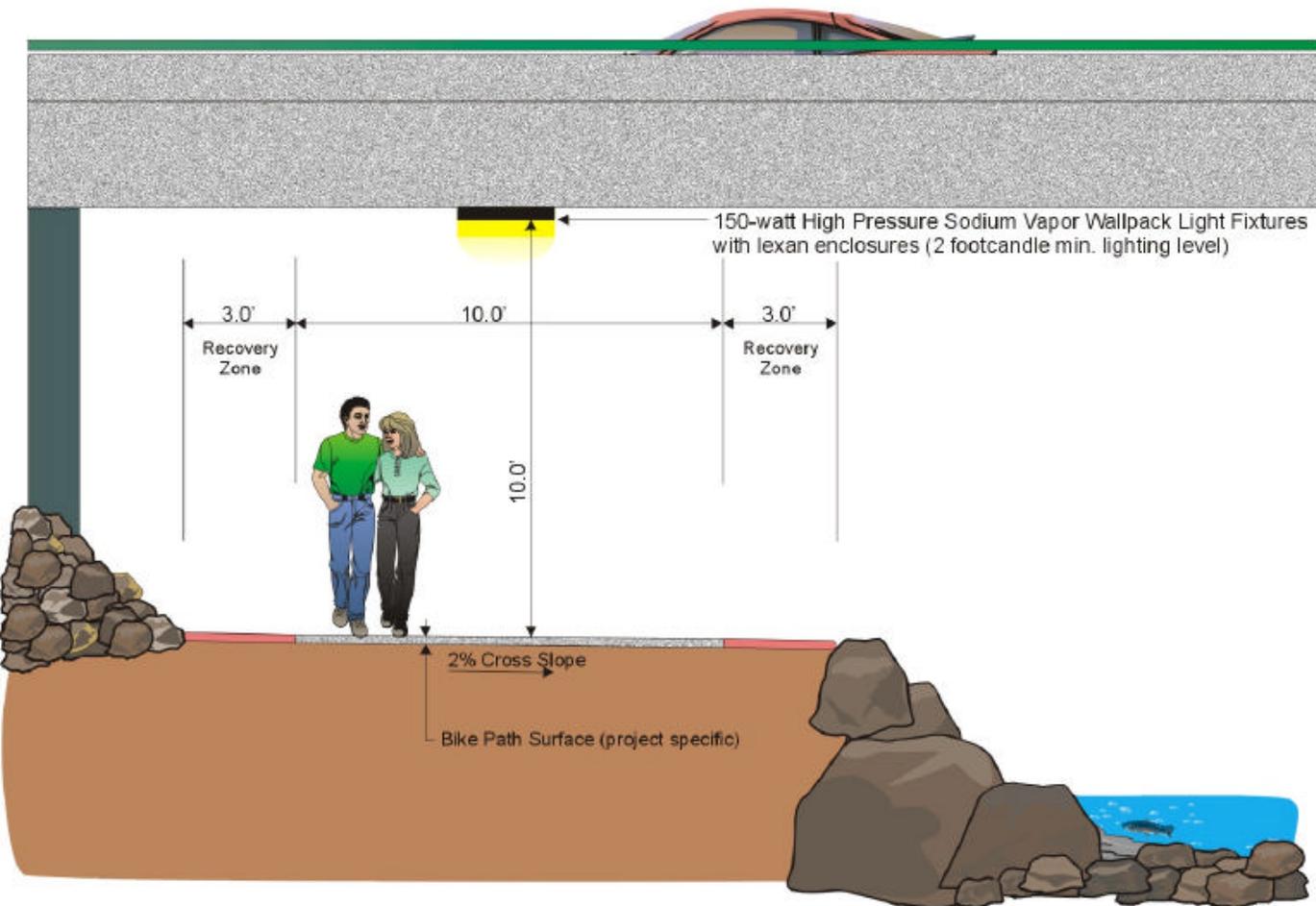
Fibrous reinforcement to be 100% virgin polypropylene fibrillated fibers containing no olefin materials.

(2) Recovery zones shall be tinted Davis Dye color 1117 (Tile Red) at a rate of three pounds per bag of Type I-II Portland Cement. Recovery zones shall be scored to 3/8" depth at 12" on centers.

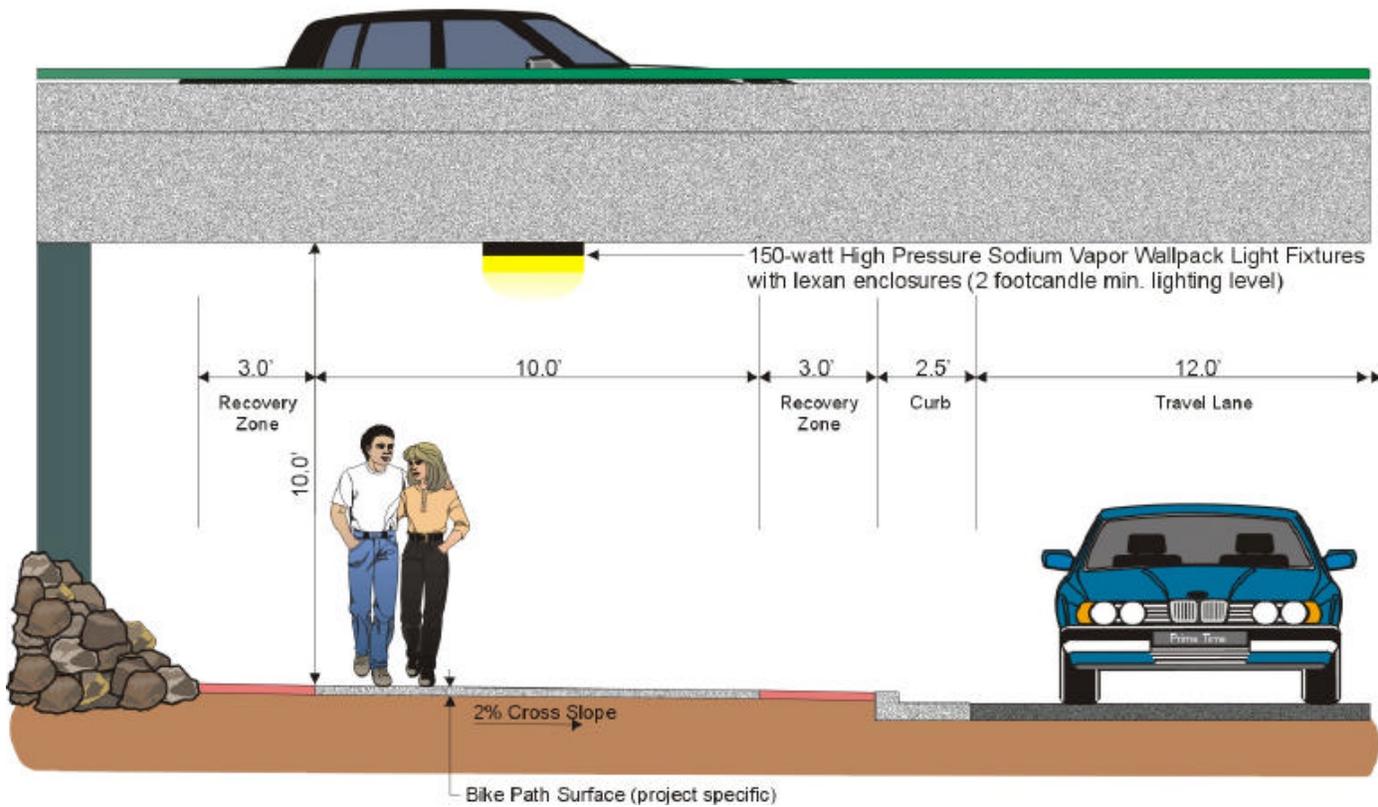
# Two-Way Path -- Tunnel Typical Section



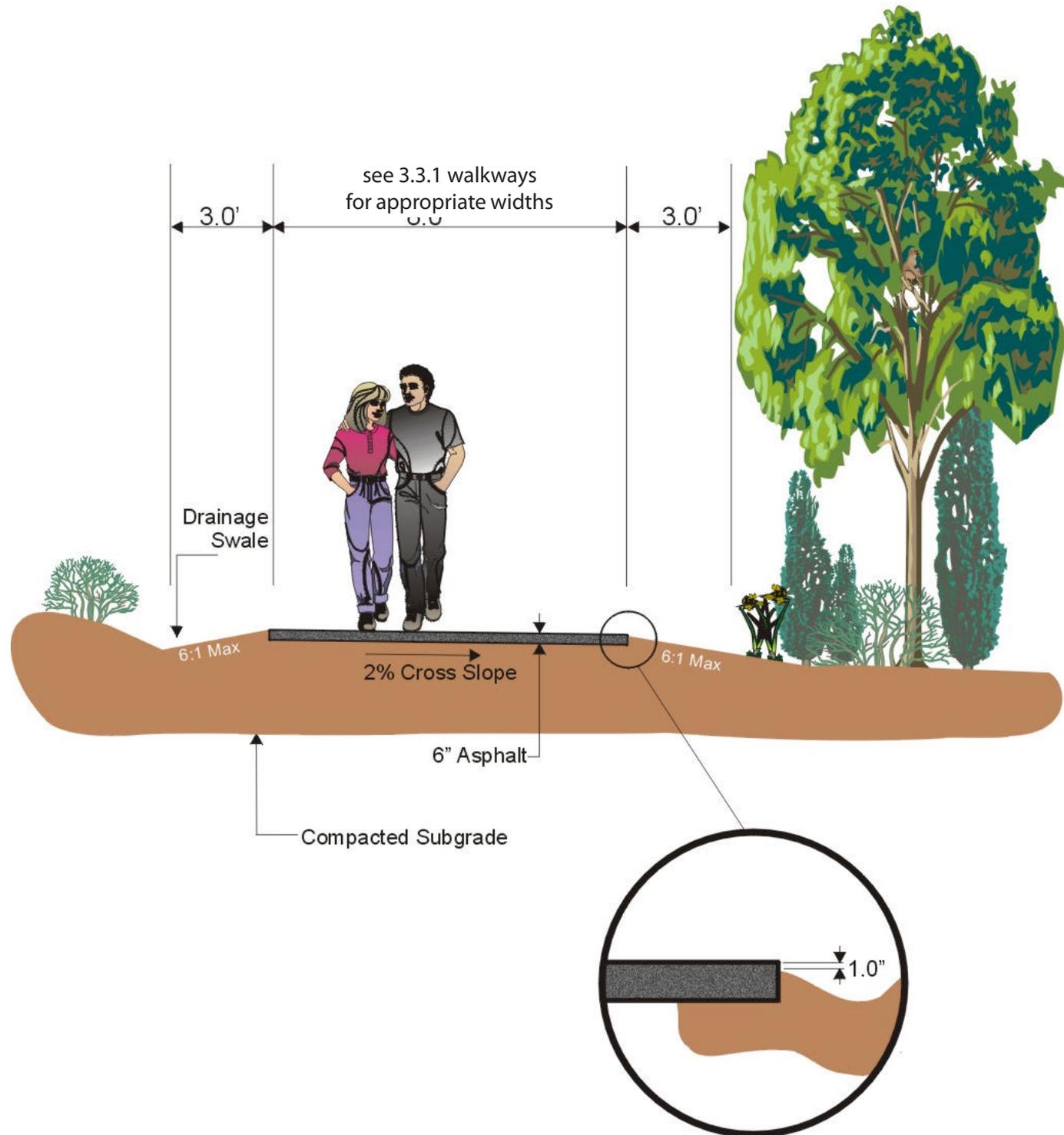
## Two-Way Path -- Bridge Underpass Typical Section



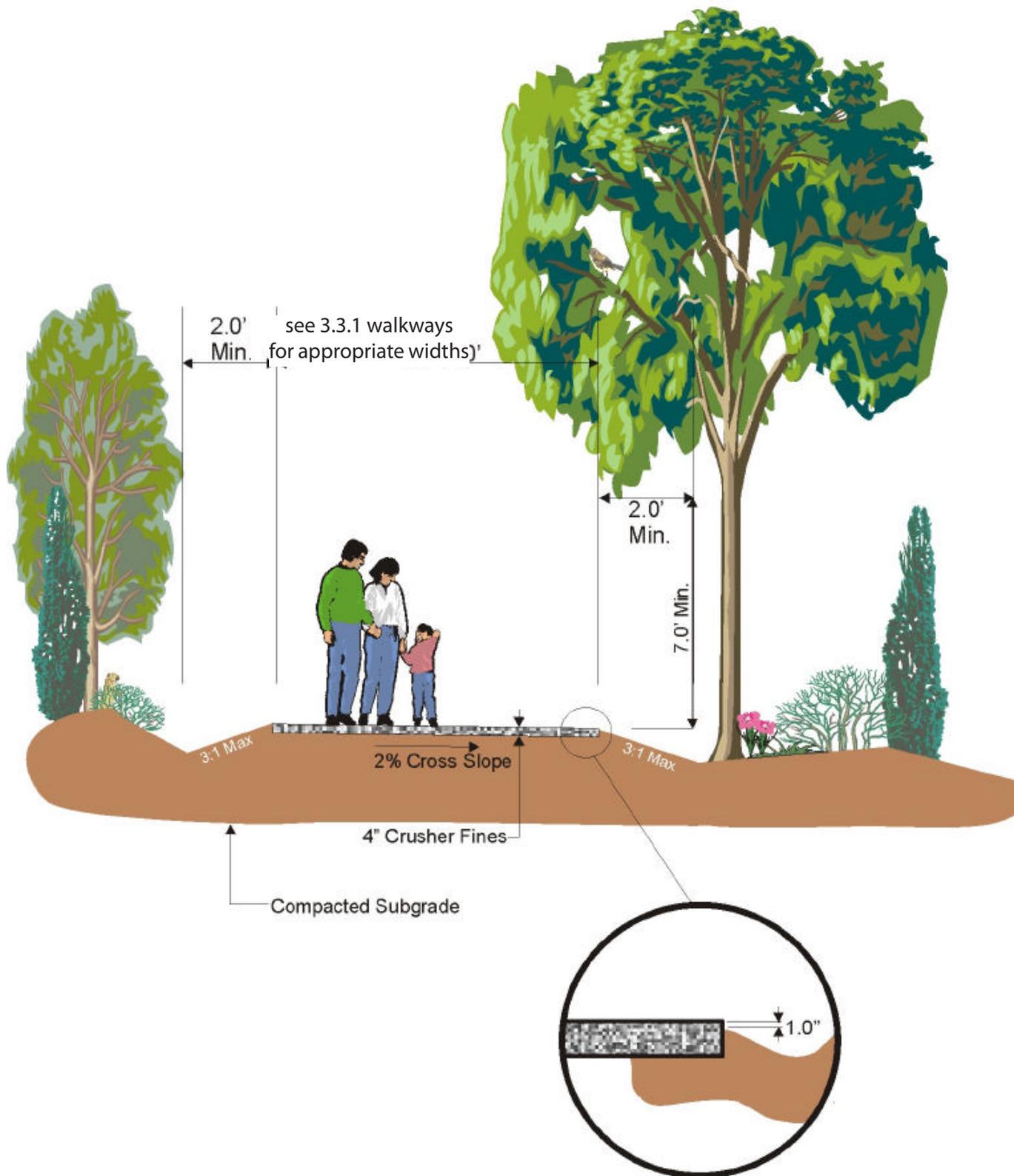
## Two-Way Path -- Bridge Underpass Typical Section



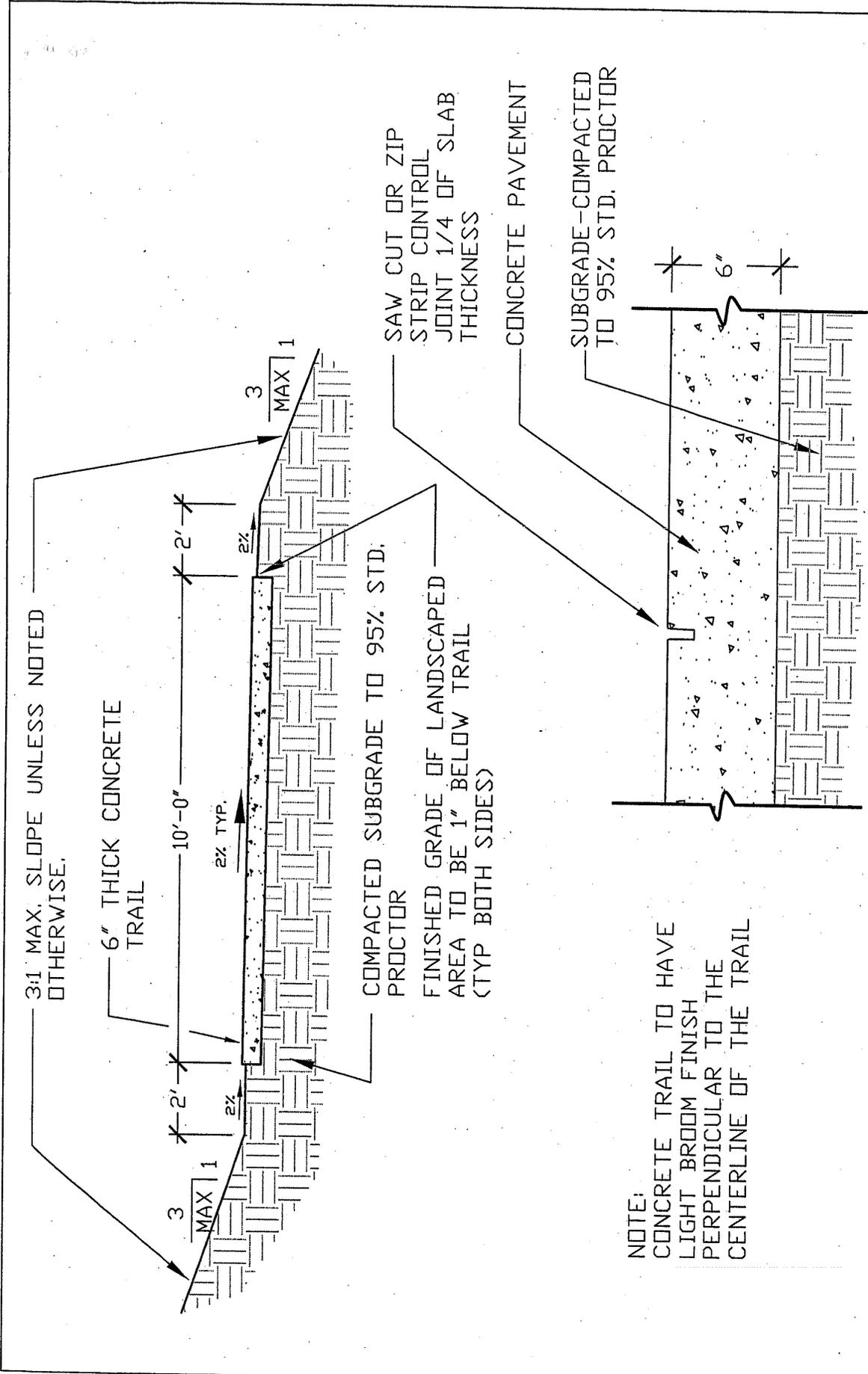
# Recreational Loops/Local Parks Paths Typical Section



# Pedestrian Walking Path/Garden Path Typical Section



# Typical Trail Details

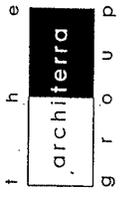


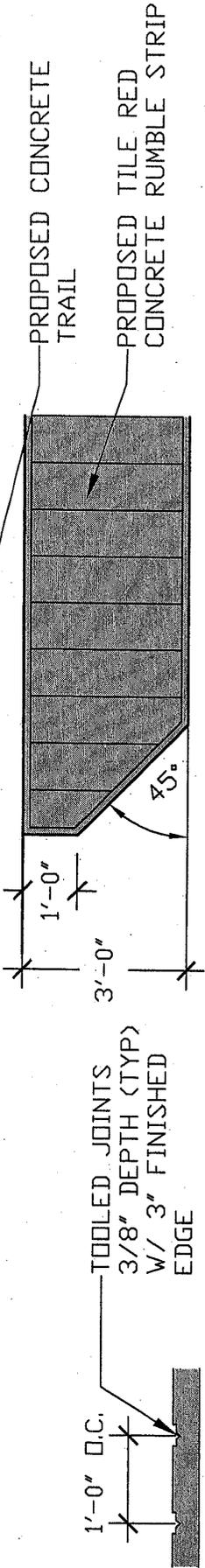
NOTE:  
 CONCRETE TRAIL TO HAVE LIGHT BROOM FINISH PERPENDICULAR TO THE CENTERLINE OF THE TRAIL

**CONCRETE TRAIL**  
 SECTION



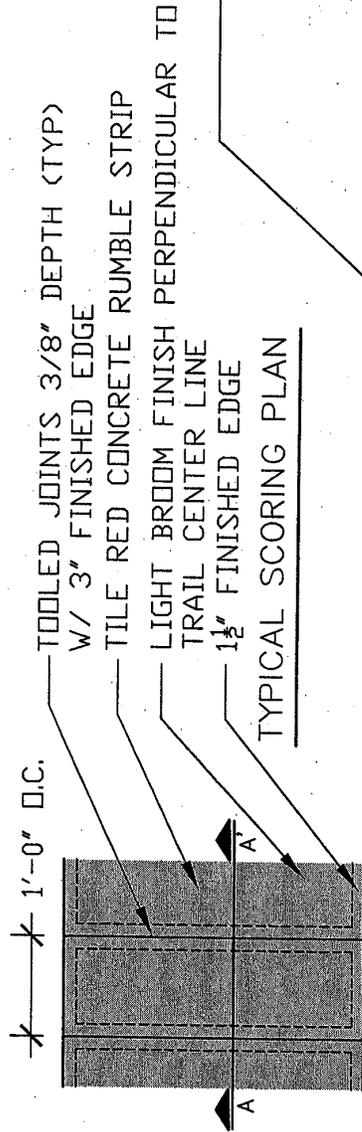
SCALE: NTS



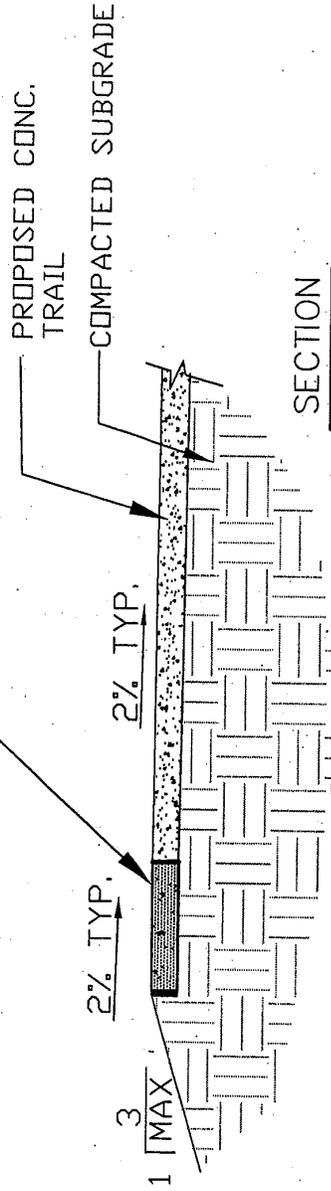


TYPICAL RETURN PLAN

SECTION A-A'

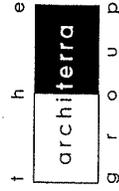


6" THICK CONCRETE RUMBLE STRIP - TILE RED COLOR (SEE SPECS.)

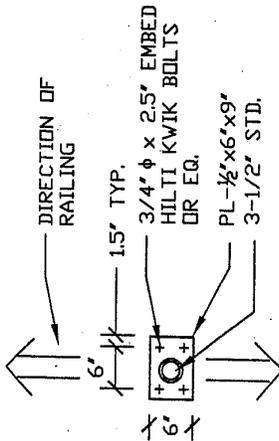


**RED RUMBLE STRIP**  
PLAN AND SECTION

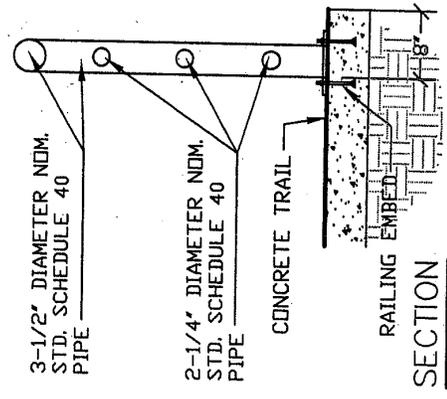
SCALE: NTS



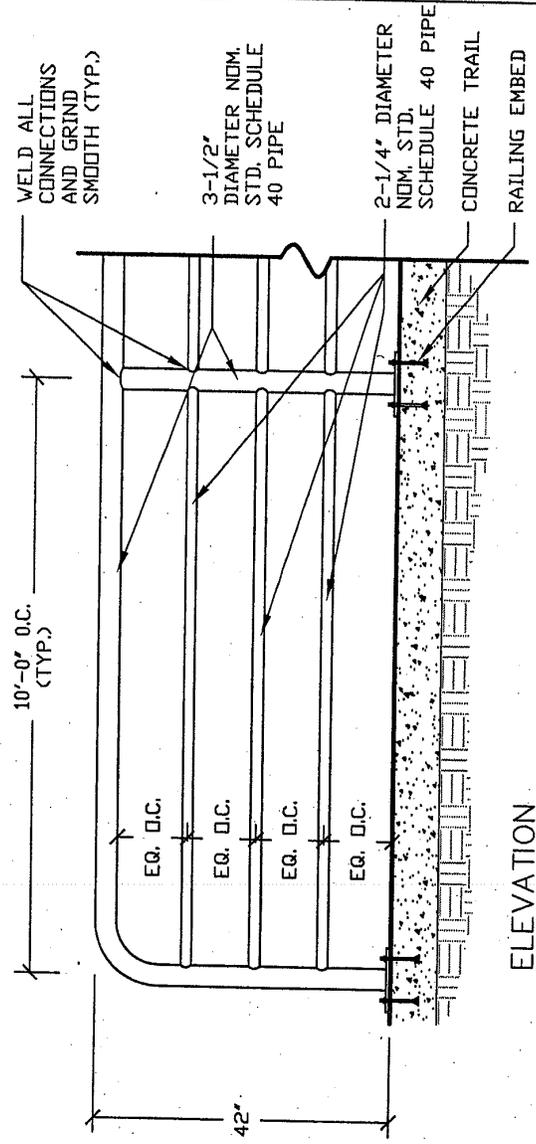




**RAILING EMBED PLAN**



**RAILING EMBED SECTION**



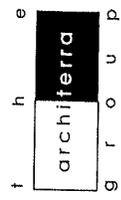
**RAILING ELEVATION**

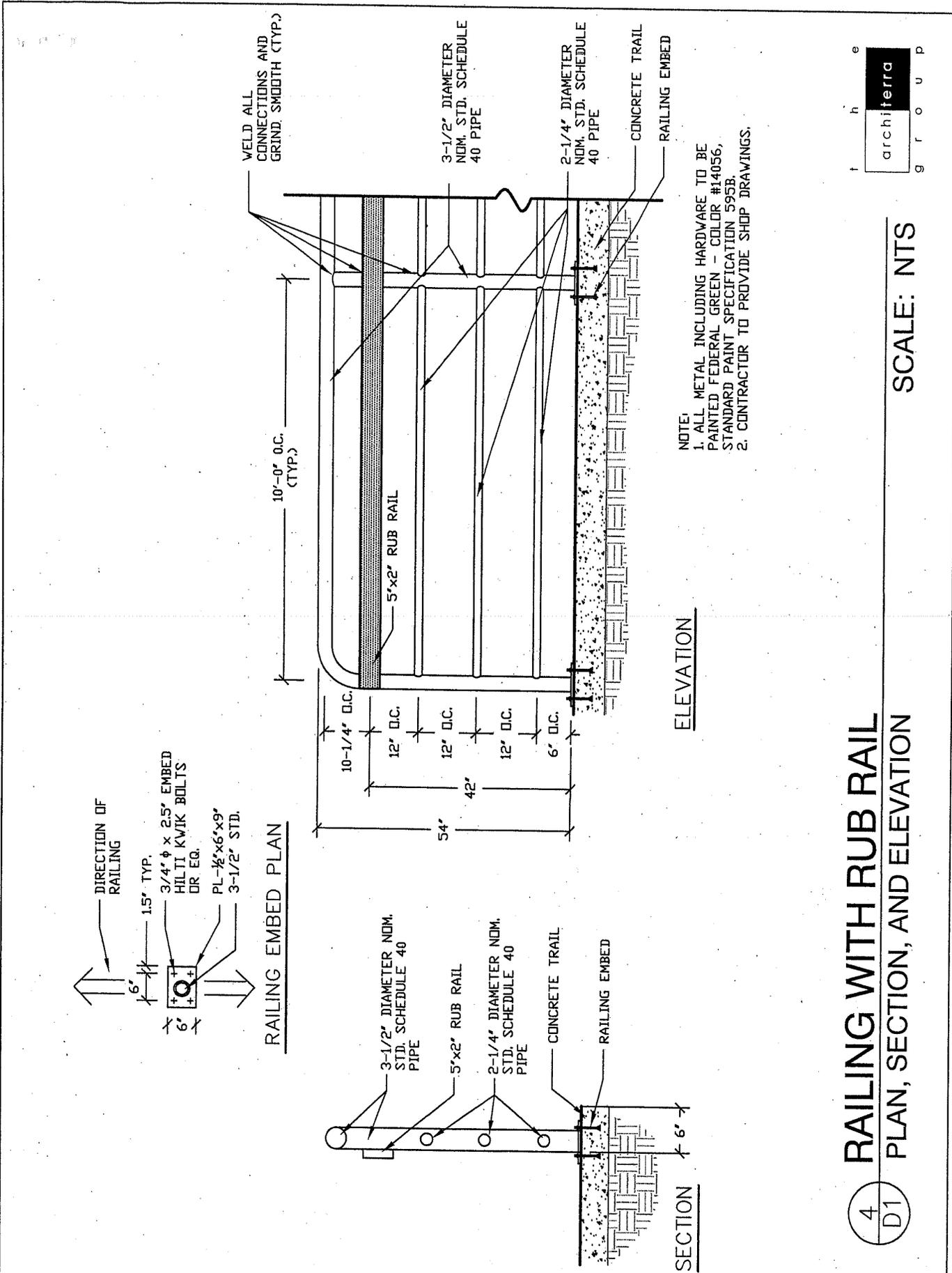
NOTE:  
 1. ALL METAL INCLUDING HARDWARE TO BE PAINTED FEDERAL GREEN - COLOR #14056, STANDARD PAINT SPECIFICATION 595B.  
 2. CONTRACTOR TO PROVIDE SHOP DRAWINGS.

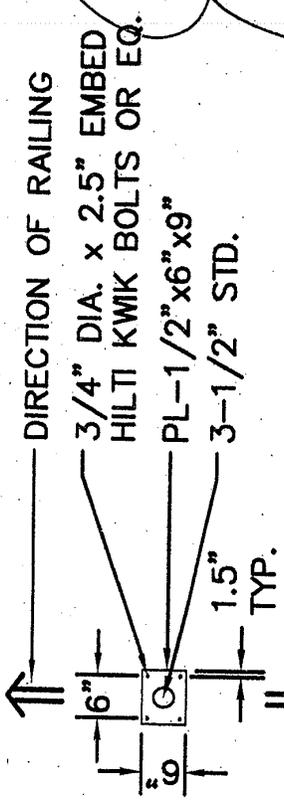
**5**  
**D1**

**RAILING**  
 PLAN, SECTION, AND ELEVATION

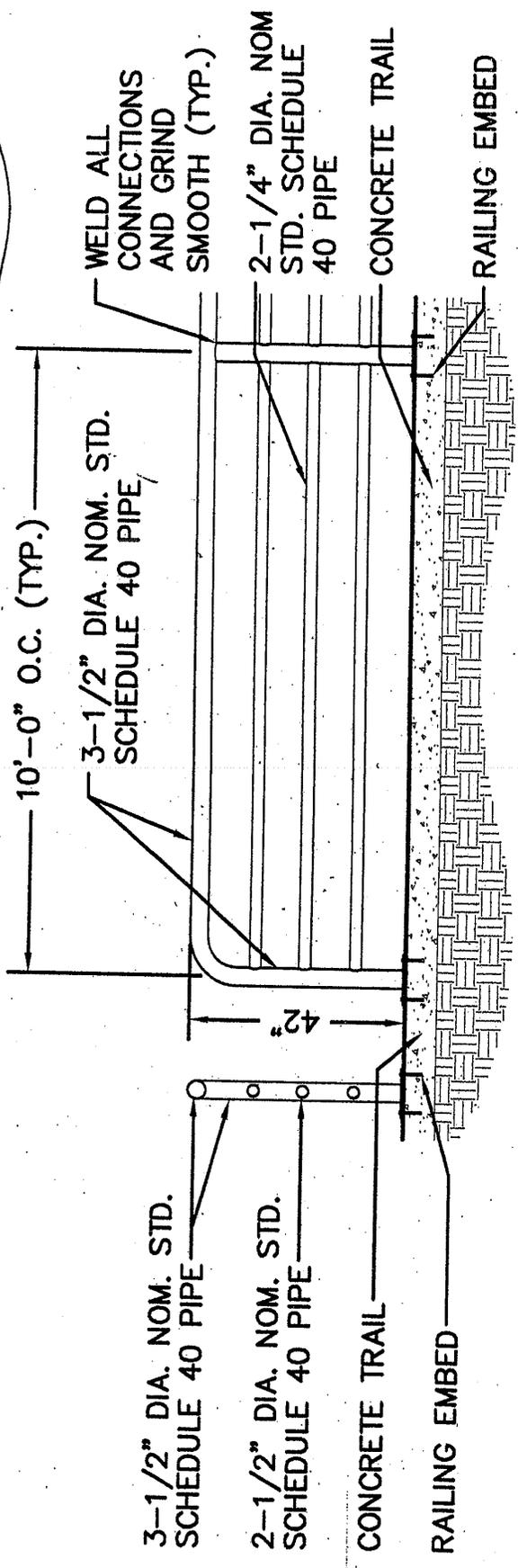
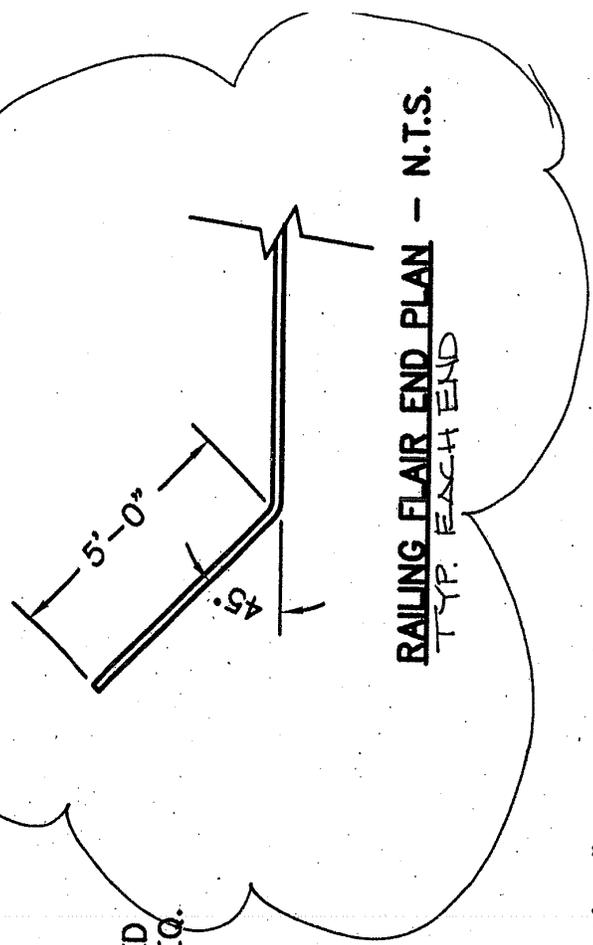
**SCALE: NTS**







**RAILING EMBED PLAN - N.T.S.**



**ELEVATION**

**SECTION**

## **DPR Future Dog Off-Leash Area Application Process**

### Premise:

Applications can come from interest groups or neighborhood groups.

Applications are accepted on an annual basis – deadline is March for implementation in following calendar year (if City funds are required)

Applications will be rated by responsiveness to site and design criteria, by location in the City (need) and by implementation/maintenance budget required by City

Goal is to have good distribution of off-leash areas city-wide that service neighborhoods in 1-2 mile radii.

Staff (District planner, maintenance superintendent, CW maintenance, Animal Control rep.) will review applications and make recommendations to manager of DPR and ES, who will make final determination.

### Requirements for Application:

Clear description of area type (fenced, times of day..)

Map of area with boundaries, size, needed amenities etc.

Proposed area has to meet off-leash site and design criteria (to be confirmed by DPR prior to any other step)

Public process has to occur (at least one public meeting) – provide record and results of process

Letters of support and opposition – a petition showing that over 50% of the residents in the area are supportive ('area' means service area and is one mile radius around proposed site)

Statements of opinion from registered neighborhood organizations, City Council office

Firm commitment by applicant group on stewardship of proposed area. (group members & contact info and plan for monthly meetings and outreach activities)

Financial/volunteer support is encouraged as an extra incentive

### Public Process/meeting:

- Invitations – two weeks prior to meeting (Parks planner to receive summary of all sent out invitations)
  - Mailing to all registered neighborhood organizations within a mile of proposed area
  - Posting at proposed area
  - Newspapers/newsletters
  - Hand delivery/ US postal service mailing to all directly adjacent neighbors (property owners and renters if applicable)
  - Posting at bulletin boards in highrises
  - Mailing to council office
  - Mailing to other park user groups (sports, permits, etc.)
  - Parks planner, Animal Control
- Meeting
  - At public facility
  - create a meeting record
  - appropriate City staff (project manager) should be present

### Process

Preliminary application for specific area – meeting with appropriate City staff to outline requirements and process

Review of area by off-leash project manager, park maint. staff, district planner, animal control  
Provisionary approval of site (triggers public process...)  
Public process (organized by applicant) but to include City staff  
Written application and support documents to off-leash project manager  
Review by project manager, parks maint. staff, district planner, animal control  
Determination of cost, feasibility, time line  
If warranted, discussion/negotiation with the applicant  
Recommendation by project manager to DPR and EH managers  
Public meeting (by City staff) to inform public of recommendation (last opportunity for public input)  
Approval/Denial by DPR and EH managers (or designee)  
Public notice/meeting by City staff (for information only)  
Implementation  
Quarterly review by City staff (training of volunteers and other assistance provided on on-going basis as needed) for first year  
Monthly monitoring by applicant group and annual review by City staff for duration of program

Application Package

DPR Park map  
Off-leash area site criteria  
List of Registered Neighborhood Associations  
Relevant City Staff contact information  
Council Office Information/district map  
Process outline



See Signage Coordinator for further information on additional signage and in-depth signage details.

Proposal No. SIGNAGE\_PARKS\_0130A (DRAWINGS)

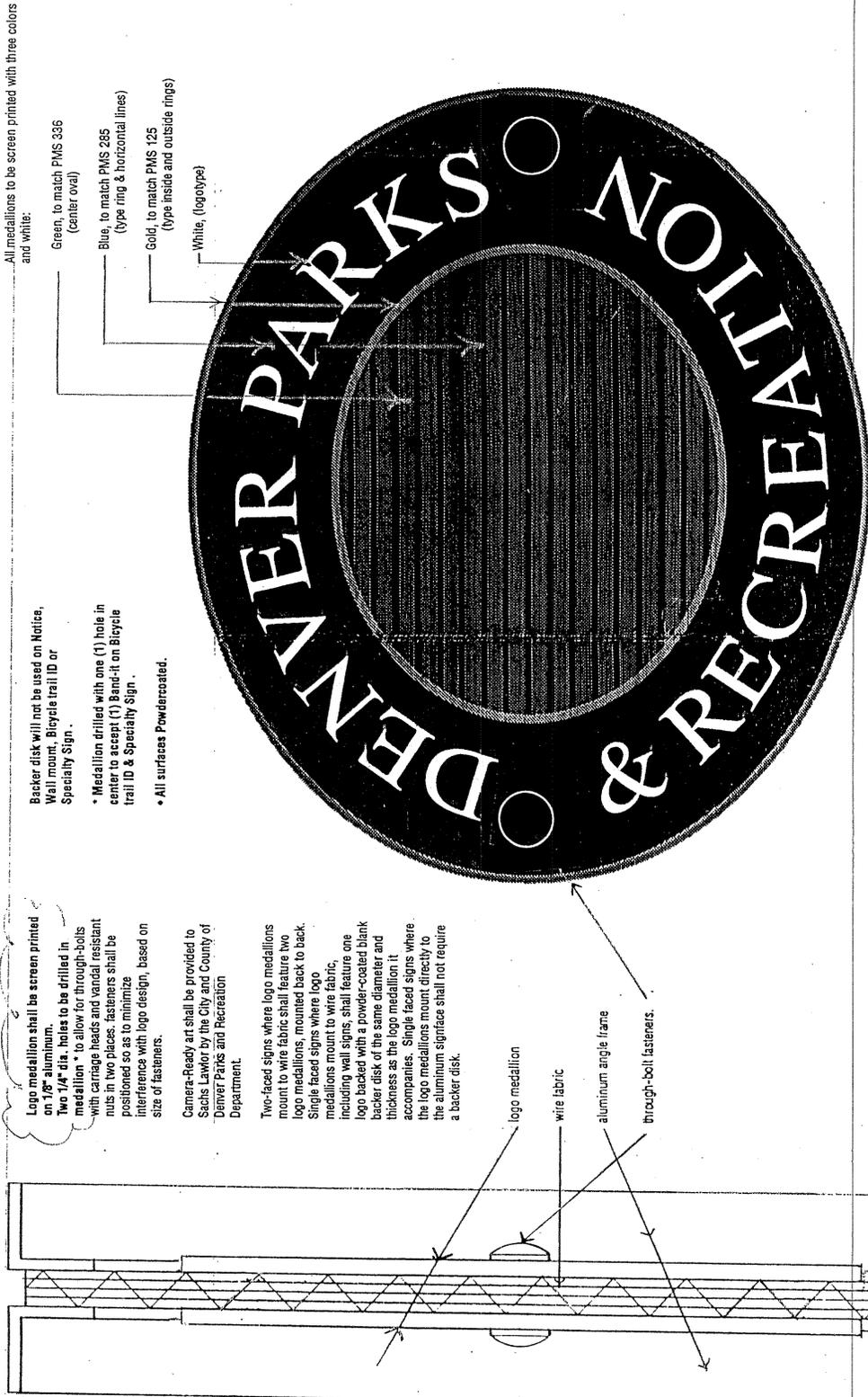
**SACHS LAWLOR**  
SIGN DIVISION

1717 SOUTH ACOMA  
DENVER, CO 80223  
PHONE: 303-777-7771  
FAX: 303-722-6004

PROJECT	CITY & COUNTY OF DENVER - PARKS AND RECREATION DEPT.		
GENERAL MANAGER	DAVID GAMEL	SHOP NAME	SACHS LAWLOR
SCALE	NTS	CHECKED BY	DRAWN BY
DRAWING NO.	1	REFERENCE SHEET NO.	1 of 31
SIGN TYPE	1		
LOGO MEDALLION			
SUBMITTAL NO.	1	SUBMITTAL DATE	5/13/93
REVISION NO.		REVISION DATE	INITIAL

DESIGN  
RESOURCES

NUMBER ONE



All medallions to be screen printed with three colors and white:

- Green, to match PMS 336 (center oval)
- Blue, to match PMS 295 (type ring & horizontal lines)
- Gold, to match PMS 125 (type inside and outside rings)
- White, (logotype)

Backer disk will not be used on Notice, Wall mount, Bicycle trail ID or Specialty Sign.

- Medallion drilled with one (1) hole in center to accept (F) Band-It on Bicycle trail ID & Specialty Sign.
- All surfaces Powdercoated.

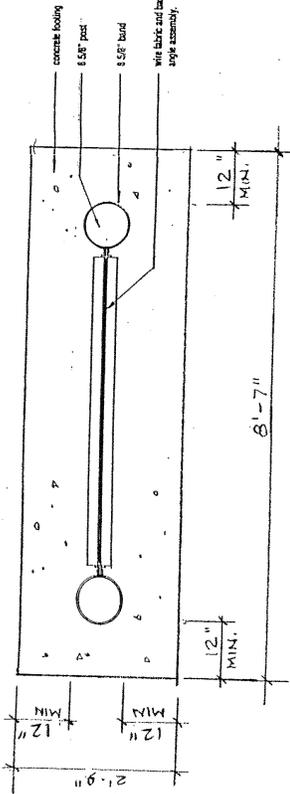
Logo medallion shall be screen printed on 1/8" aluminum. Two 1/4" dia. holes to be drilled in medallion \* to allow for through-bolts with carriage heads and vandal resistant nuts in two places. Fasteners shall be positioned so as to minimize interference with logo design, based on size of fasteners.

Camera-Ready art shall be provided to Sachs Lawlor by the City and County of Denver Parks and Recreation Department.

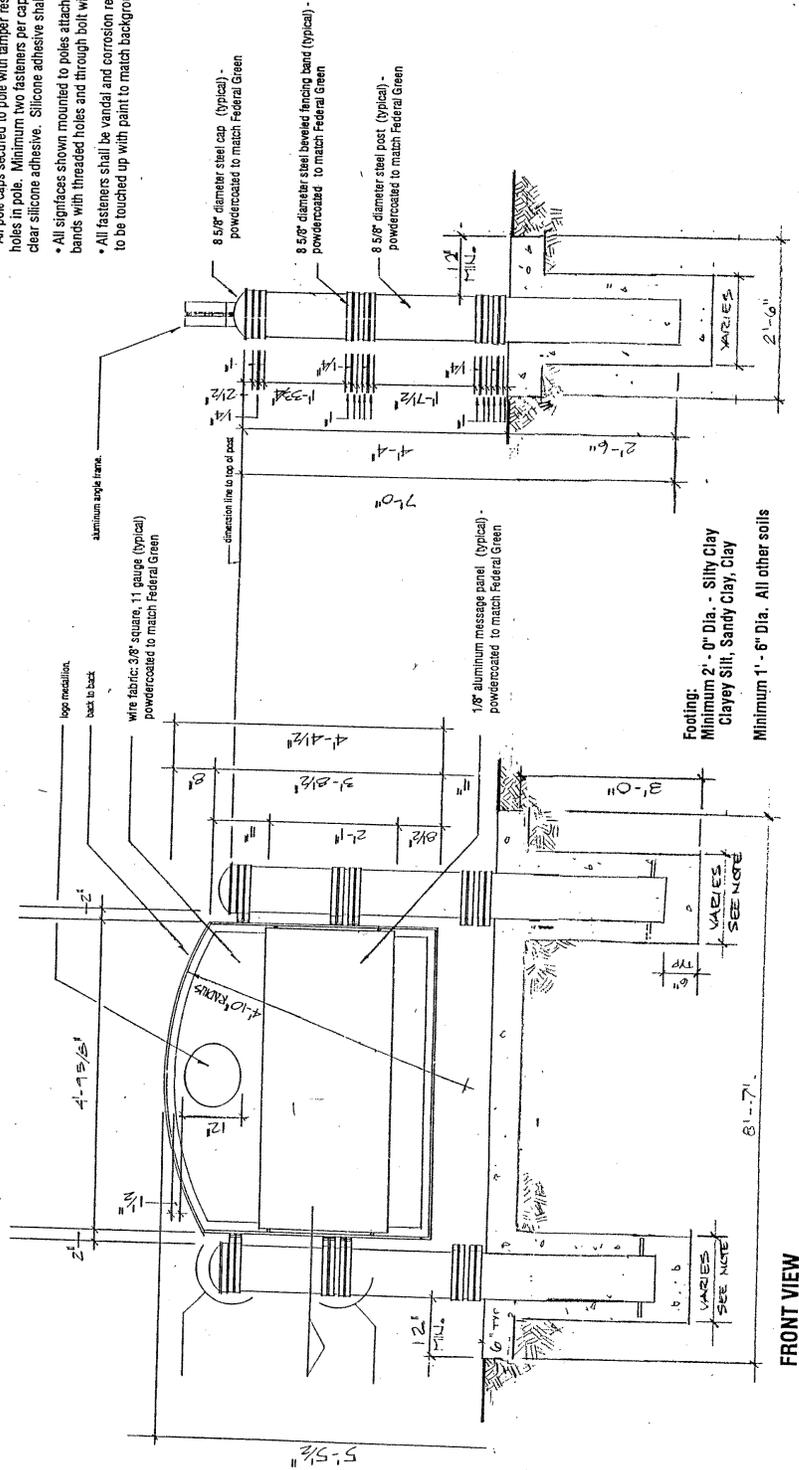
Two-faced signs where logo medallions mount to wire fabric shall feature two logo medallions, mounted back to back. Single faced signs where logo medallions mount to wire fabric, including wall signs, shall feature one logo backed with a powder-coated blank backer disk of the same diameter and thickness as the logo medallion it accompanies. Single faced signs where the logo medallions mount directly to the aluminum signface shall not require a backer disk.

logo medallion  
wire fabric  
aluminum angle frame  
through-bolt fasteners.

Proposal No. SIGNAGE\_PARKS\_01300A (DRAWINGS)



TOP VIEW



FRONT VIEW

SIDE VIEW

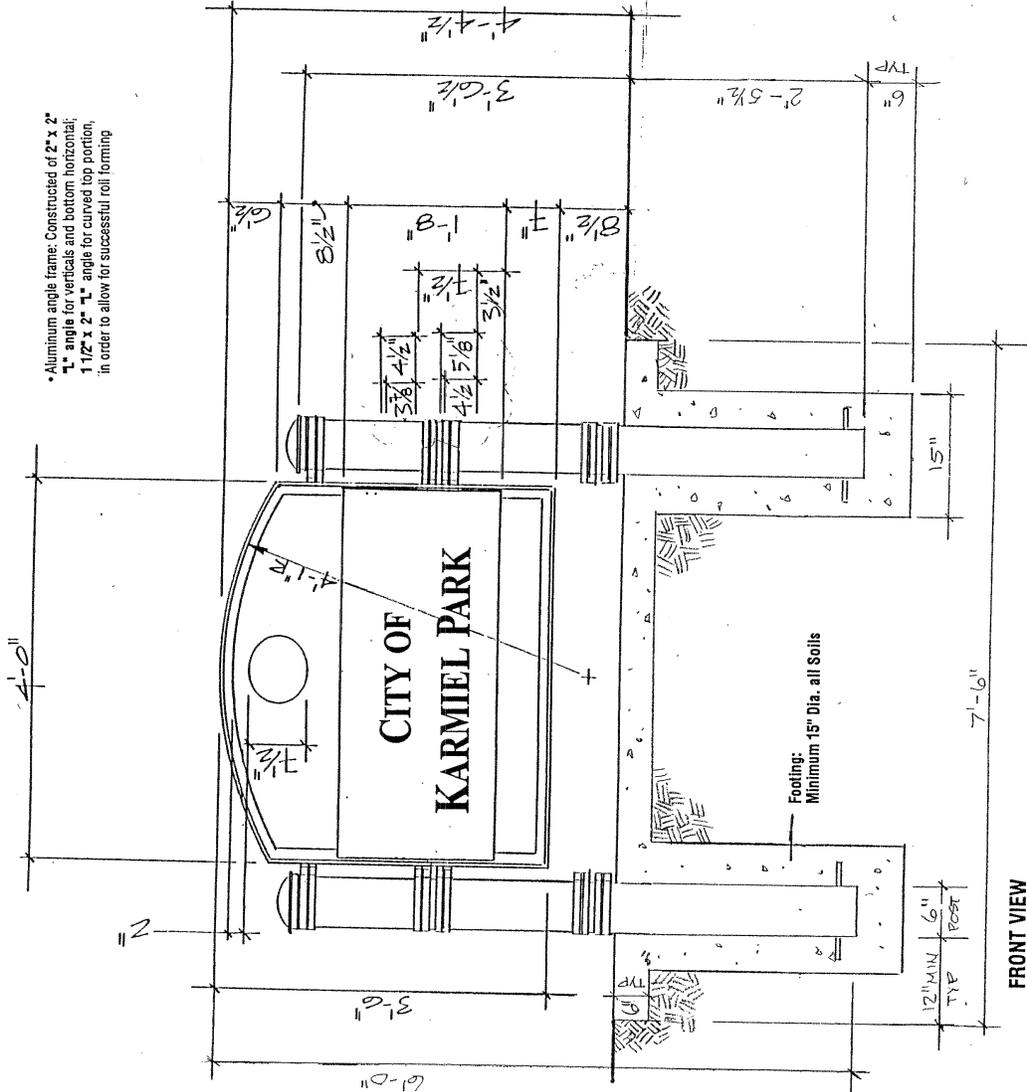
- Metal Finishes:
  - All poles, polecaps, banding, wire fabric, frames, mounting angles and message panels to be powdercoated.
  - Powdercoating: to match Federal Green as per approved sample
  - Steel Powdercoating: iron phosphate dip process
  - Aluminum Powdercoating: chromate conversion process
- Copy:
  - Park name to be Times New Roman, condensed 80%
  - Cap/Small Cap
  - Gerber-cut Scotchcal white 180-10.

- Logo medallion - 12" : - screenprinted three colors and white on aluminum edge painted to match Federal Green
- Assembly:
  - All pole caps secured to pole with tamper resistant fasteners into through-holes in pole. Minimum two fasteners per cap. Seal caps to pole with 20 year clear silicone adhesive. Silicone adhesive shall not be visible.
  - All signages shown mounted to poles attached using 1" steel beveled fencing bands with threaded holes and through bolt with nylon washers, as required.
  - All fasteners shall be vandal and corrosion resistant. All exposed fasteners to be touched up with paint to match background, after final assembly.



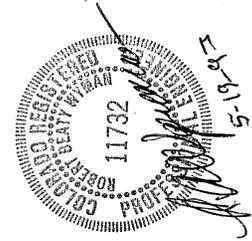
 CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION	SIGN TYPE:	SHEET TITLE:
	LARGE PARK ID	GRAPHIC STANDARDS MANUAL
DESIGNED BY: WEBER DESIGN	DRAWN BY:	CHECKED BY: T. HAWKEY
DATE: 8/1/92	REVISIONS: 1. 5/13/93 2. 8/30/95	PARKS & REC. DTC. NO.
SHEET NUMBER:		SHEET NUMBER:

SHEET TITLE: GRAPHIC STANDARDS MANUAL	<b>SMALL PARK ID</b>	DESIGNED BY: WEBER DESIGN	DRAWN BY:	CHECKED BY: T. HAWKEY	DATE: 8/9/02	REVISIONS: 1. 5/13/03 2. 8/30/03	PARKS & REC. DWG. NO.	SHEET NUMBER:
CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION								



• Aluminum angle frame. Constructed of 2" x 2"  
 L- angle for verticals and bottom horizontal;  
 1 1/2" x 2" L- angle for curved top portion,  
 in order to allow for successful roll forming

- Metal Finishes:
  - All poles, polecaps, banding, wire fabric, frames, mounting angles and message panels to be powdercoated.
  - Powdercoating: to match Federal Green as per approved sample
  - Steel Powdercoating: iron phosphate dip process
  - Aluminum Powdercoating: chromate conversion process
- Copy:
  - Park name to be Times New Roman, condensed 80%
  - Cap/Small Cap -
  - Gerber-cut Scotchcal white 180-10.
- Logo medallion - 7 1/2" h - screenprinted three colors and white on aluminum edge painted to match Federal Green
- Assembly:
  - All pole caps secured to pole with tamper resistant fasteners into through-holes in pole. Minimum two fasteners per cap. Seal caps to pole with 20 year clear silicone adhesive. Silicone adhesive shall not be visible.
  - All signfaces shown mounted to poles attached using 1" steel beveled fencing bands with threaded holes and through bolt with nylon washers, as required.
  - All fasteners shall be vandal and corrosion resistant. All exposed fasteners to be touched up with paint to match background, after final assembly.



FRONT VIEW

Proposal No. SIGNAGE\_PARKS\_0130A (DRAWINGS)

- Copy:
- Park name to be Times New Roman, condensed 80%
  - Gerber-cut Scotchlite White 180-10

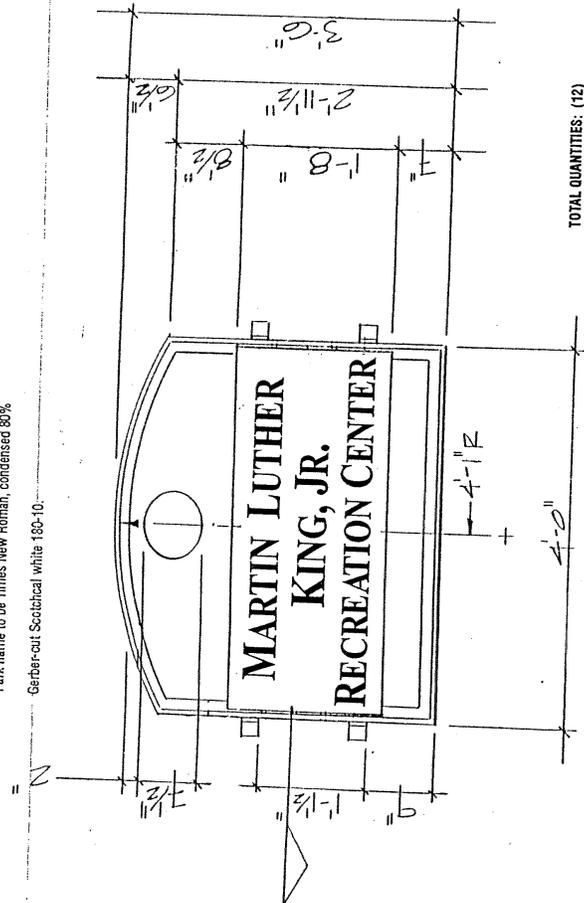
- Metal Finishes:
  - All poles, polecaps, banding, wire fabric, frames, mounting angles and message panels to be powdercoated.
  - Powdercoating: to match Federal Green as per approved sample
  - Steel Powdercoating: iron phosphate dip process
  - Aluminum Powdercoating: chromate conversion process

1 1/2" x 1 1/2" x 3/16" thick aluminum angle frame with mitred, welded corners and 5/16" holes as dimensioned. Welds to be finished smooth. (2) frames required per sign, attached back to back with 1/4" vandal resistant corrosion resistant screws and nuts thru 3/8" wire fabric.

5/16" holes for message panel installation

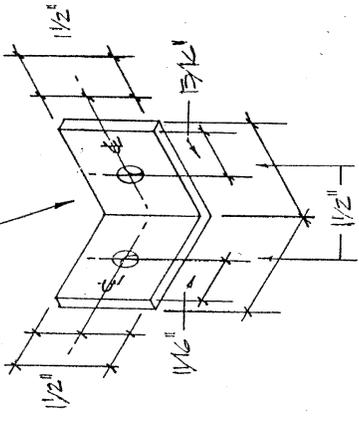
1 1/2" x 1 1/2" x 3/16" aluminum mounting angle with 5/16" holes. Attach to sign's 1 1/2" angle frame with 1/4" vandal resistant corrosion resistant screws and nuts. Attach to wall with appropriate 1/4" vandal resistant corrosion resistant anchors

TOTAL QUANTITIES: (12)



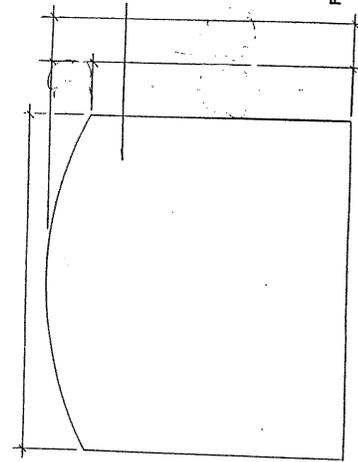
FRONT VIEW

SIDE VIEW, ANGLE FRAMES & WIRE FABRIC ASSEMBLED



MOUNTING ANGLE

3/8" 11 gauge wire fabric. Dimensions shown are after fabric is stretched and bolted to aluminum angle frame. The mounting angle and attachment of fabric to frame to be performed in accordance with fabric manufacturer's recommendations.



FRONT VIEW, WIRE FABRIC

FRONT VIEW, WIRE FABRIC

- Logo metallation - 7 1/2" h - screenprinted three colors and white on aluminum edge painted to match Federal Green
- Assembly:
  - All pole caps secured to pole with tamper resistant fasteners into through-holes in pole. Minimum two fasteners per cap. Seal caps to pole with 20 year clear silicone adhesive. Silicone adhesive shall not be visible.

- All signfaces shown mounted to poles attached using 1" steel beveled fencing bands with threaded holes and through bolt with nylon washers, as required.
- All fasteners shall be vandal and corrosion resistant. All exposed fasteners to be touched up with paint to match background, after final assembly.

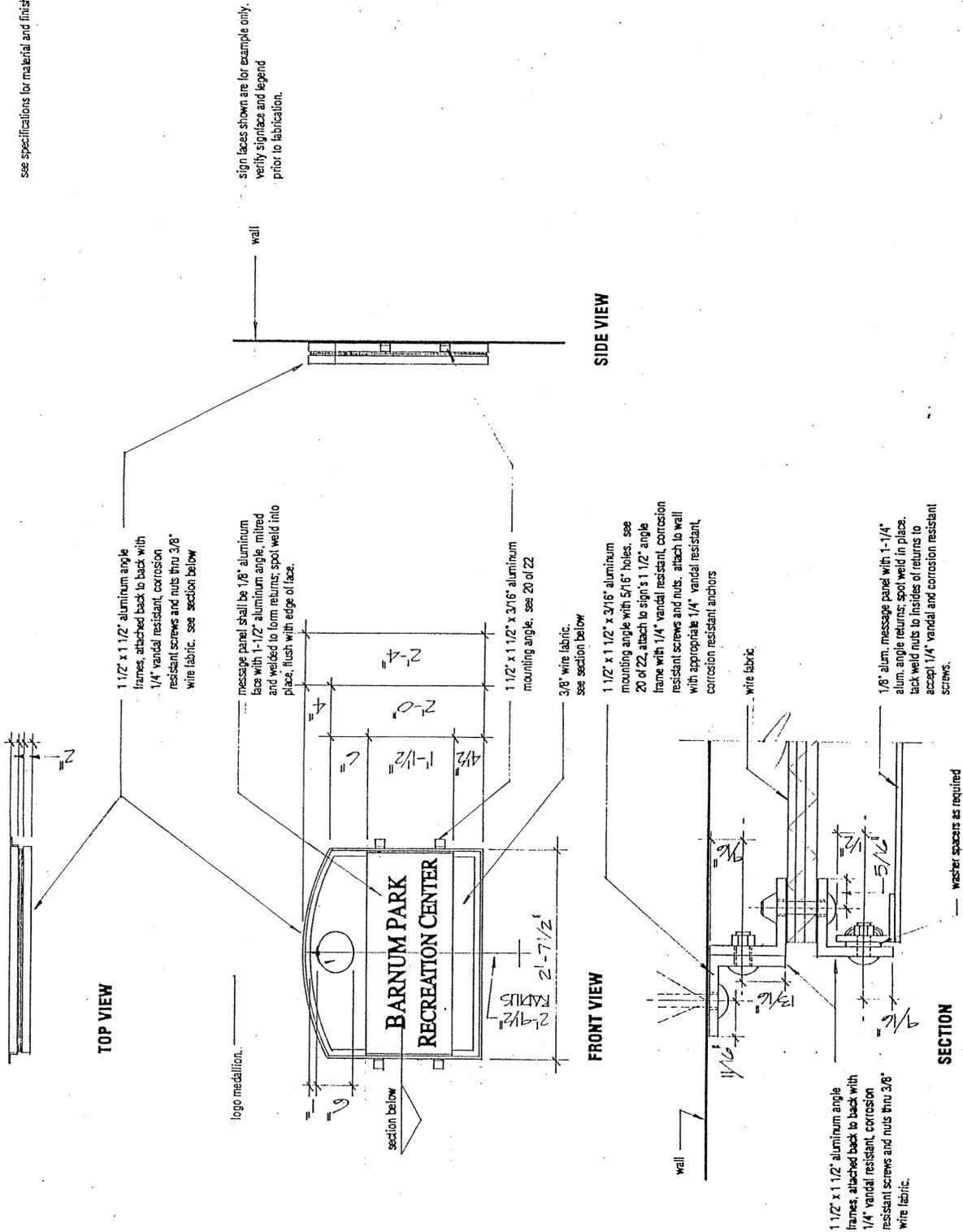
CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION  
SHEET TITLE: GRAPHIC STANDARDS MANUAL

LARGE BUILDING ID  
SIGN TYPE:

DESIGNED BY: WEBER DESIGN	CHECKED BY: T. HATVEY	DATE: 6/9/92	REVISIONS: 1. 5/15/93 2. 8/26/95
DRAWN BY:			
PARKS & REC. DWG. NO.			SHEET NUMBER:

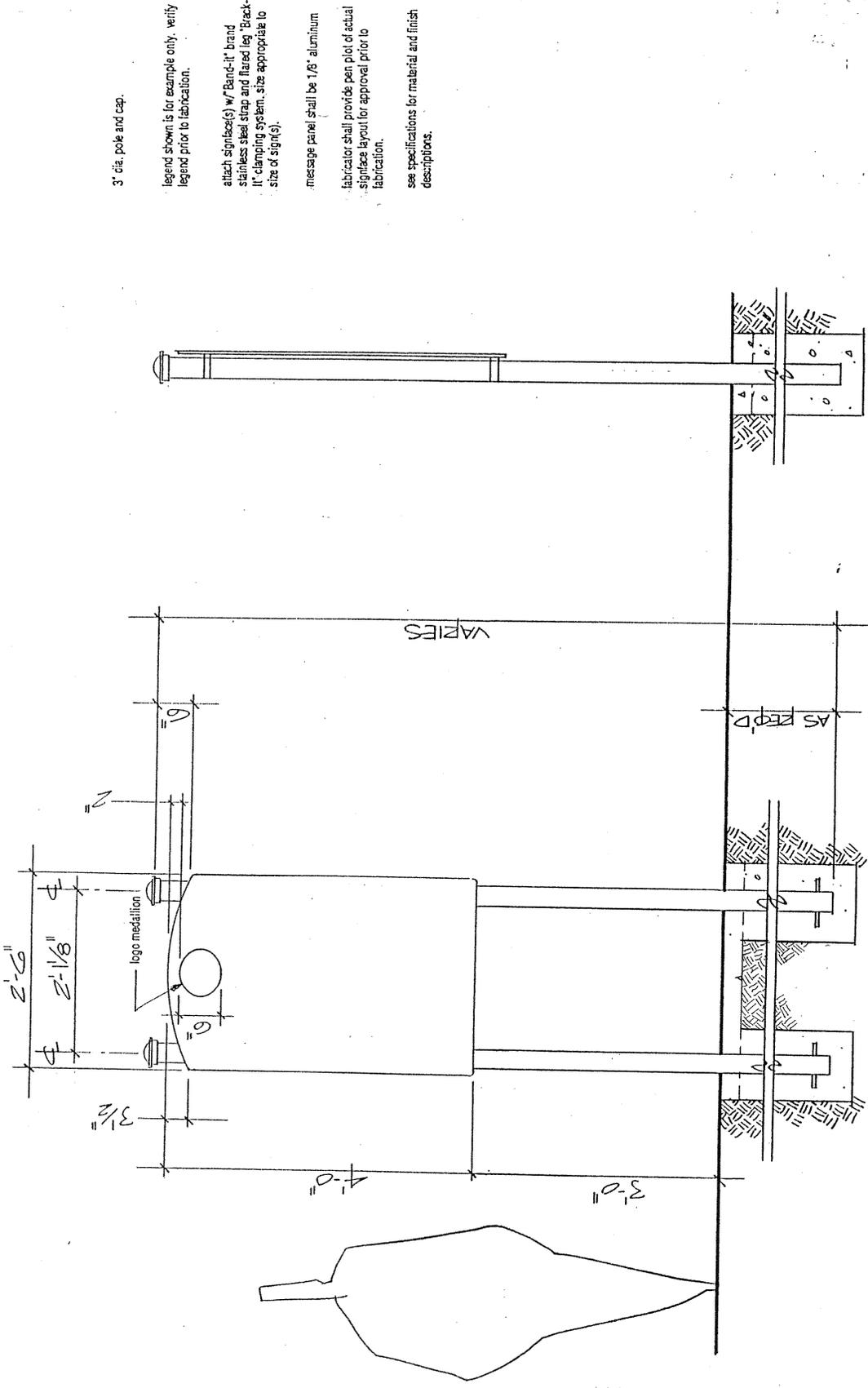
CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION		SIGN TYPE:	SMALL BUILDING ID
		SHEET TITLE:	GRAPHIC STANDARDS MANUAL
DESIGNED BY:		WEBER DESIGN	
DRAWN BY:			
CHECKED BY:		T. HARVEY	
DATE:		8/9/92	
REVISIONS:		1. 5/15/93 2. 8/30/95	
PARKS & REC. Dwg. NO.:			
SHEET NUMBER:			

see specifications for material and finish descriptions





CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION 	SHEET TITLE: GRAPHIC STANDARDS MANUAL	INTERPRETIVE NOTICE
	SIGN TYPE:	DESIGNED BY: WEBER DESIGN
CHECKED BY: T. HAWKEY	DRAWN BY:	DATE: 8/9/92
REVISIONS: 1. 5/13/98 2. 8/30/95	PARKS & REC. DWG. NO.	SHEET NUMBER:



3" dia. pole and cap.

Legend shown is for example only, verify legend prior to fabrication.

attach sign(s) w/ "Band-It" brand stainless steel strap and flared leg. "Band-It" clamping system, size appropriate to size of sign(s).

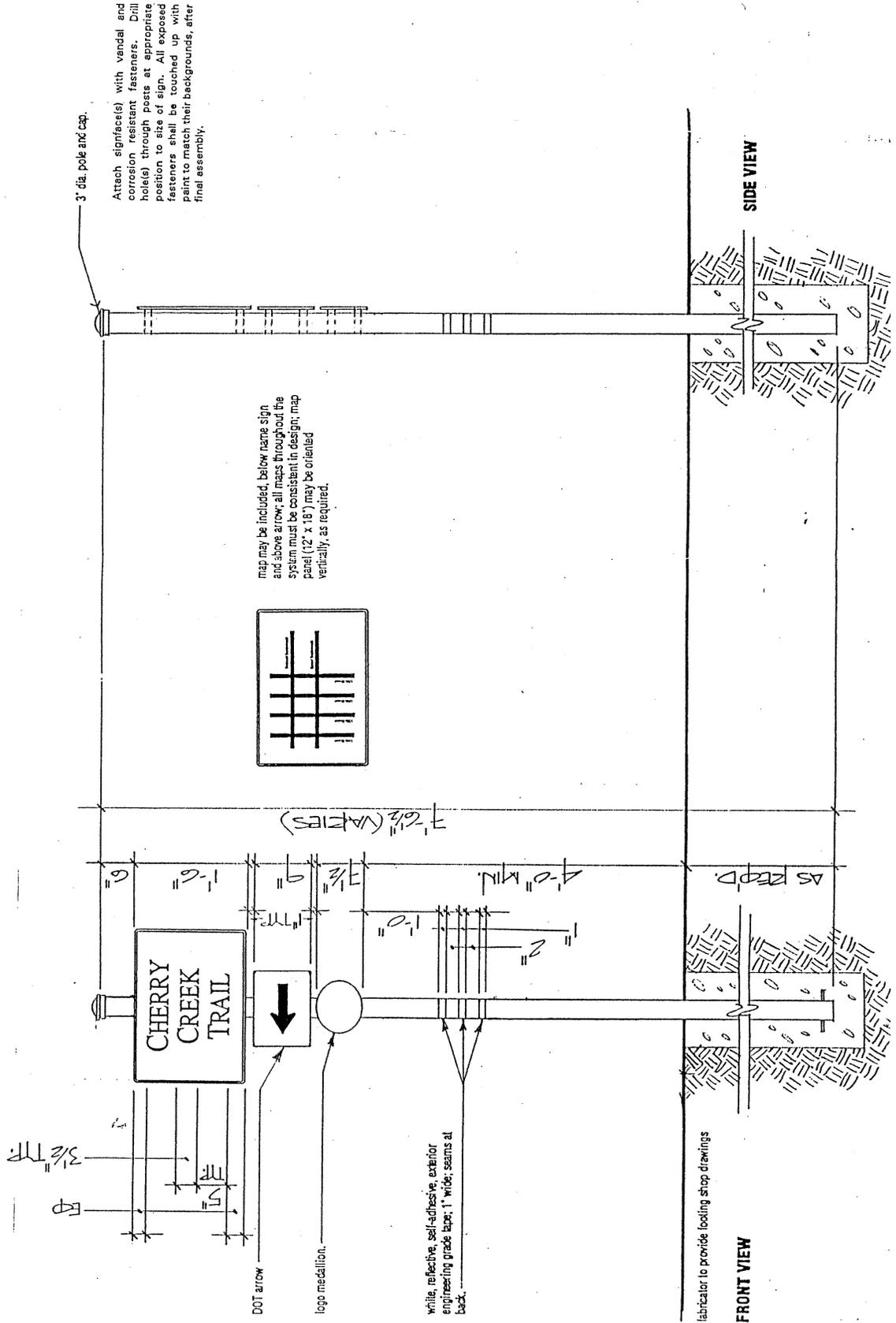
message panel shall be 1/8" aluminum

fabricator shall provide pen plot of actual signface layout for approval prior to fabrication.

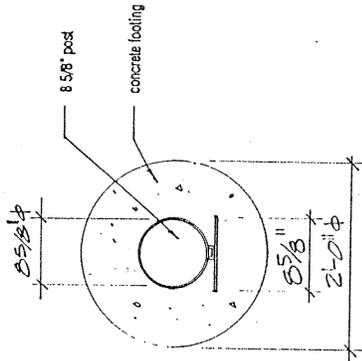
see specifications for material and finish descriptions.

Proposal No. SIGNAGE\_PARKS\_0130A (DRAWINGS)

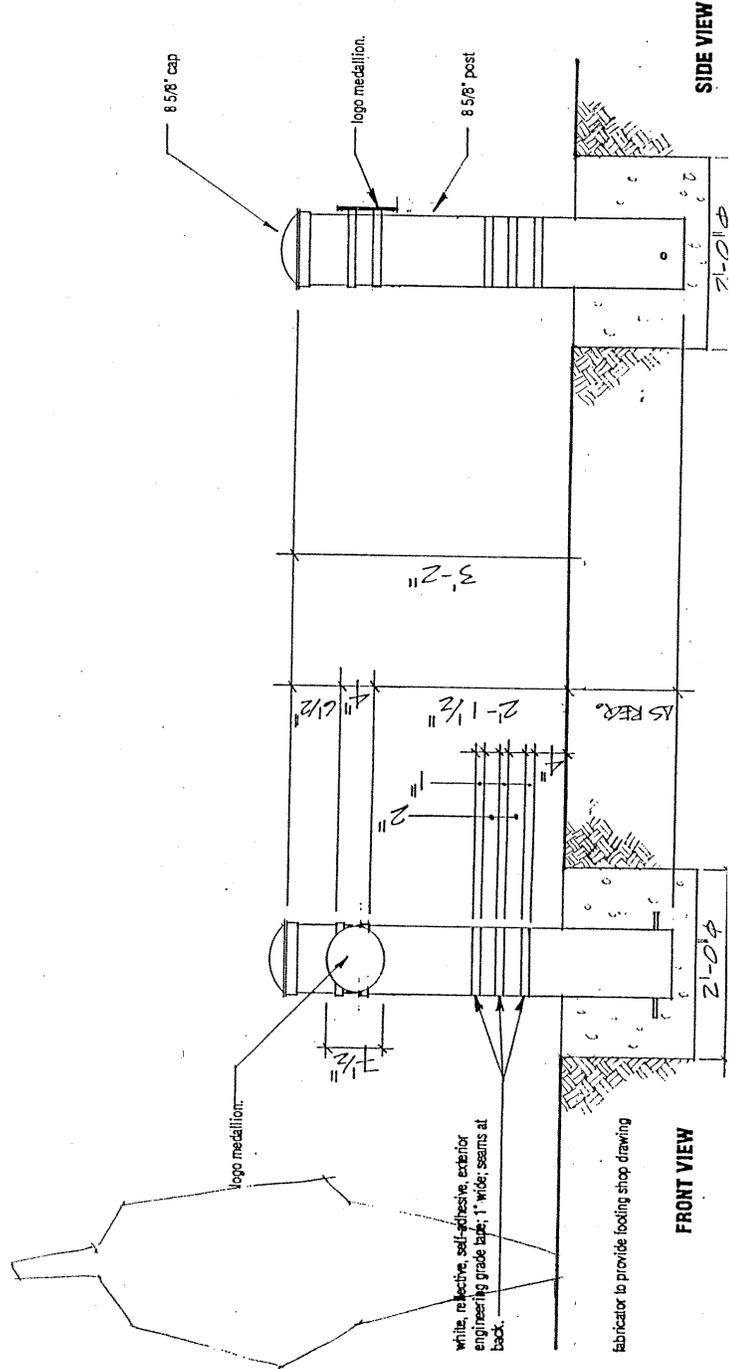
CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION		SIGN TYPE:	BICYCLE TRAIL ID
		SHEET TITLE:	GRAPHIC STANDARDS MANUAL
DESIGNED BY:	WEBER DESIGN	DATE:	8/9/92
DRAWN BY:	T. HAWKEY	CHECKED BY:	T. HAWKEY
REVISIONS:	1. 8/15/93 2. 8/30/95	PARKS & REC. DWG. NO.	
SECRET NUMBER:			



 CITY & COUNTY OF DENVER DEPT. OF PARKS & RECREATION	SIGN TYPE: PERMANENT BOLLARD
	SHEET TITLE: GRAPHIC STANDARDS MANUAL
DESIGNED BY: WEBER DESIGN	CHECKED BY: T. BARTNEY
DRAWN BY:	DATE: 8/9/92
REVISIONS:	1. 8/15/93 2. 8/30/95
PARKS & REC. Div. NO.	SHEET NUMBER:



TOP VIEW



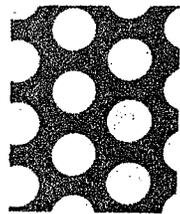
FRONT VIEW

SIDE VIEW

attach signface(s) w/ "Band-It" brand stainless steel strap and flared leg "Black-It" clamping system, size appropriate to size of sign(s).

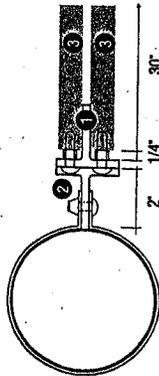
**INTERPRETIVE PANEL AND MOUNTING DETAILS**

- 1 2"x2" ALUMINUM TEE FRAME MITERED AND WELDED
- 2 2"x2" ALUM TEE MOUNTING BRACKET WELDED TO TEE FRAME
- 3 3/4" FOLIA PANEL 30" X 48"
- 4 ATTACH FOLIA PANEL TO FRAME WITH THREADED TAMPER AND CORROSION RESISTANT SCREWS
- 5 4-5/8" STEEL POST POWDERCOATED TO MATCH FEDERAL GREEN FOR STEEL. IRON PHOSPHATE DIP PROCESS FOR ALUMINUM. CHROMATE CONVERSION PROCESS
- 6 ALUM. SIGN PANEL FRAMES ARE ATTACHED TO POLES USING 1" STEEL BEVELLED FENCING BANDS WITH THREADED HOLES AND THROUGH BOLT WITH NYLON WASHERS AS REQUIRED.
- 7 2" X 2" ANGLE IRON FRAME ROLLED TO A 6" RADIUS PERFORATED METAL WELDED TO INSIDE OF FRAME FROM THE TOP AND POWDER COATED
- 8 SET POSTS IN CONCRETE FOOTING WITH CONCRETE PAD FOOTING: 2" DIA. CLAY SOILS MIN. 1'-6" DIA. ALL OTHER SOILS
- 9 CONCRETE PAD SIZE AND CONFIGURATION TO BE DETERMINED BY FINAL LOCATION AND HANDICAP ACCESS

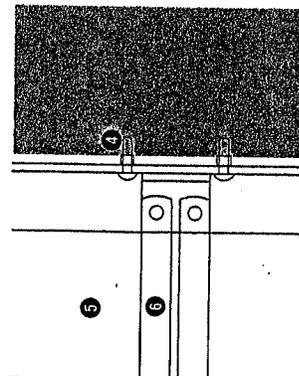


PERFORATED METAL ROOF  
23/64" DIA. 1/2" STAG. CENTERS  
5 HOLES PSI 47% OPEN AREA

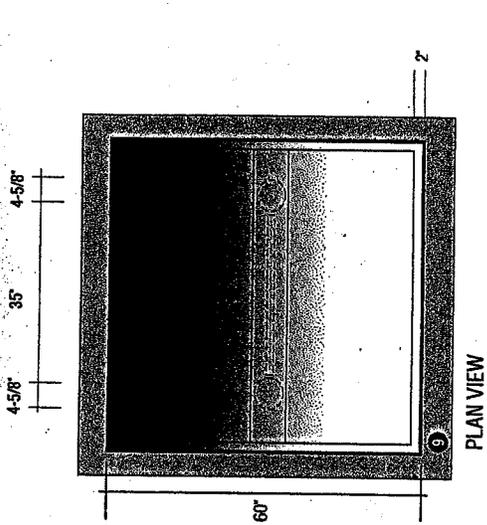
NOTE: REFER TO DENVER PARKS & RECREATION GRAPHIC STANDARDS MANUAL DATED OCTOBER, 1992 FOR GENERAL NOTES AND SPECIFICATIONS FOR PAINT, POWDERCOATING, FOOTINGS, ASSEMBLY AND COMPLIANCE WITH ADA.



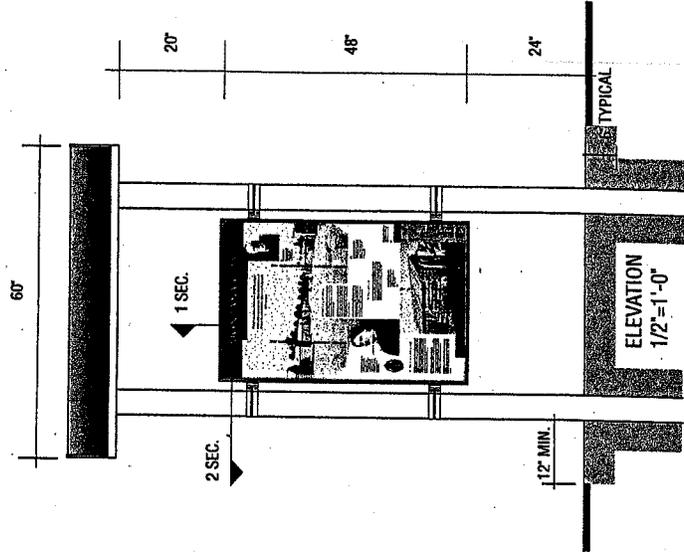
2 - SECTION



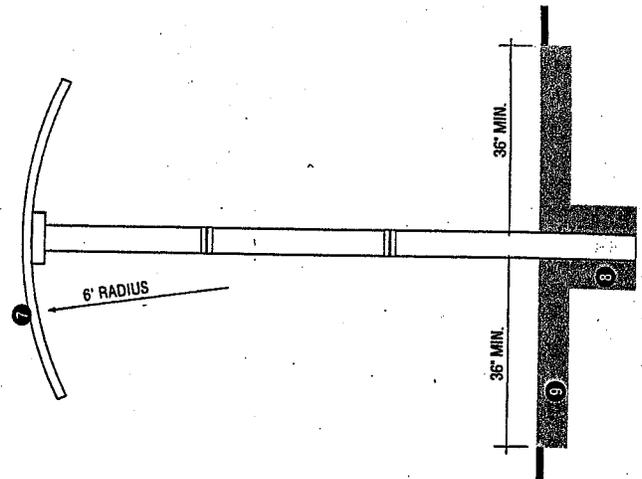
1 - SECTION



PLAN VIEW



ELEVATION  
1/2"=1'-0"



<p>CITY &amp; COUNTY OF DENVER DEPARTMENT OF PARKS &amp; RECREATION</p>	<p><b>SPECIALTY SIGN</b></p>	<p>SIGN TYPE: Upright Interpretive</p>	<p>SHEET TITLE: GRANT-FRONTIER PARK SIGN CONSTRUCTION DETAILS</p>
	<p>DESIGNED BY: QUINCY CLUNE DESIGN</p>	<p>DRAWN BY: D. CLUNE</p>	<p>CHECKED BY:</p>
<p>REVISIONS</p>		<p>PARKS &amp; REC. DWG NO.</p>	<p>SHEET NUMBER</p>





## **Control Dimensions**

1301 Glencoe Street, Denver, Colorado 80220-2560

Phone: 303-377-5677 Fax: 303-333-3599 Cell: 720-530-6162

# **Denver Department of Parks and Recreation Guidelines for Fountain Vault Facilities and Equipment December 7, 2005**

The following standards and guidelines are intended for both new and fully funded reconstructed fountains under the supervision of the Department of Parks and Recreation. This document does not address aesthetic or artistic issues of the fountain structure or water features.

Before construction drawings are produced, a review of this document with the Fountain Review Committee is required to determine which provisions shall be applicable to a particular project. Construction drawings must be submitted to this Committee for final review before submission to the Building Department for approval.

## **General Considerations**

- Safety is the utmost priority when remodeling or building a fountain, both in the public water display as well as in the equipment vault. This point cannot be overemphasized. The general public and maintenance personnel must be protected from the unique hazards created by fountains.
- A dry environment is the goal for the fountain vault. Standing water and streams of water on the floor from operating equipment are not acceptable.
- All current City of Denver and UBC codes (structural, electrical, plumbing, etc.) shall be followed in the design and construction of a fountain.
- Permits must be pulled before construction and a final inspection by the Denver Building Department will be required before a fountain is placed into operation.
- All equipment shall be designed and installed with careful attention to serviceability and long-life. Access for maintenance, type of service connections and selection of materials shall all be important considerations in this process.
- Finishes, materials and devices that do not rust or are rust-resistant are to be used whenever possible, as long as the cost of such items is not prohibitive.
- All valves and electrical controls shall be clearly and permanently marked.
- A plan for filling, draining, cleaning and operating the fountain shall be developed with the assistance of the DPR and posted in the fountain equipment vault.
- Crusher fines and other landscape material that can be kicked or blown into a fountain should never be installed in close proximity to a fountain basin.

## **Extent of Application**

These guidelines will usually have broader application in new construction than in the remodeling of an existing facility. Size, complexity and site conditions will determine the extent of the requirements applied to a specific project. However, all fountain projects will be subject to certain core code and facility upgrades.

NOTE: Items marked with a "C" are considered critical to all fountain construction, whether remodel or new construction.

## **Vault Access**

- C: Access for personnel shall be designed to accommodate safe and swift egress in case of emergency. Confined-space designation should be avoided if possible.
- C: The vault access opening shall also be designed to be large enough to allow convenient and safe movement of all fountain equipment into and out of the vault for installation, service, and future replacement.

## **Fountain Suction Lines**

- C: Anti-vortex/anti-entrapment devices designed to prevent human entrapment must protect all main fountain suction lines. (Skimmers are not considered main fountain suction lines.) These protective devices must require a tool to be removed for service.

- C: Screens or trash baskets should be installed on all suction lines – properly sized for the expected level of environmental debris. Screens must be accessible for service on a regular basis and require a tool to be removed. Non-rusting material must be used for any submerged screening devices.

## Plumbing

- The fresh water supply line shall be of adequate size to facilitate a quick re-filling of the fountain.
- C: The fresh water supply line shall be protected with an RPZ valve that meets all local codes.
- C: The RPZ valve shall be isolated with ball valves and installed with unions on each side to facilitate easy removal for service.
- C: The RPZ valve drain line must be plumbed so as not to interfere with personnel mobility or equipment access in the vault.
- C: If a solenoid-operated valve is used for automatic makeup water, it shall be isolated with ball valves and installed with unions on each side to facilitate easy removal for service. In addition, a by-pass loop with a ball valve for manual filling shall also be installed.
- Specifications for water level sensors and valves for automatic makeup water shall be submitted to the Department of Parks and Recreation for approval prior to construction. Electronic sensing devices (not mechanical) are required.
- Fountain drain lines should be of adequate size to expedite the draining process.
- Whenever possible, all fountain basins should be capable of being drained with permanent plumbing rather than requiring a portable pump.
- C: Fountain pumps and plumbing shall be installed with drain cocks installed at all low points to allow for complete draining of the system in the winter. All drain lines from fountain plumbing should be piped directly to the sewer or sump.
- Floor drains shall be installed and the floor sloped toward the drains.
- If the fountain vault has an elevation above grade, an emergency drain to daylight shall be installed to prevent flooding of the vault. This emergency drain shall not take the place of floor drains plumbed to the vault sump or sewer.
- C: Ball valves, gate valves and butterfly valves shall be used for all fountain plumbing; globe valves are not desirable due to internal restrictions.
- A drain line to a sanitary sewer shall be provided for draining the fountain and carrying the effluent from the equipment vault floor drains and sump.
- Sumps and sump pump(s) shall be installed whenever the elevation of the fountain vault requires a lift for the floor drains and fountain drain to meet the elevation of the sanitary sewer.
- Dual sump pumps shall be installed when the electronics and water processing equipment in the fountain vault represent a significant investment that needs to be protected against single pump failure. This will be typical of interactive and other computer-controlled fountains.

## Water Clarity and Sanitizing

The size of the fountain, volume of water contained within the fountain system, flow rate of the water features and amount of public contact with the fountain water will all be factors in determining whether a separate fountain filtration system will be required or if it is an integral part of the fountain water display system.

- C: A high-rate NSF-approved sand filter with either manual or automatic backwash (as specified by the DPR) will be required for all fountains. The sand filter shall be of commercial grade and have square footage and flow matched to turn the volume of the fountain water system at a rate to be determined by the amount of public contact with the water and local conditions. This turnover rate shall not exceed two hours for fountains with large volumes of water.
- If the filtration system is integral with the water display system, the flow rate will be determined by the requirements of the water display.
- If the filtration system is separate from the water display system, skimmers, return inlets and a separate filtration pump shall be part of this filtration package. Return inlets should be located to direct surface debris to float towards the skimmers.
- C: The filtration pump shall be equipped with a strainer with a removable basket.
- If the fountain basin is likely to attract people to have significant contact with the water (as opposed to occasional and casual contact) it will be critical to install a water sanitizing system. Swimming pool water quality standards should be applied to the design. Automatic feeding of bromine is the preferred chemical treatment. However, bromine systems are not acceptable if the water drained from the fountain runs into a storm sewer instead of a sanitary sewer. Ultraviolet and ozone treatment systems should be considered as desirable sanitizing technologies.
- Like a swimming pool, proper water balance is essential to maintain the plumbing, stone, statuary and concrete of the fountain in good condition. Provision for either manual or automatic monitoring of water balance is required.
- Each installation will require individual discussion with the DPR and the Denver Health Department as to exact requirements for water treatment.

## Electrical

All provisions of the current National Electrical Code applicable to fountain installations shall be followed. As part of and in addition to these requirements, the following items are to be included:

- C: All electrical equipment in the fountain shall either be UL listed or be manufactured by a UL 508 certified shop and have a UL508 sticker. Low-voltage control systems are the exception to this requirement.
- C: All electrical enclosures shall be at least NEMA 3R rated.
- C: All electrical conduits inside fountain vaults shall be Schedule 40 PVC or flexible PVC liquid-tight conduit with appropriate connectors. Any conduits run outside the fountain vault shall be Schedule 80 PVC.
- C: J-boxes and pull boxes should be made of PVC or other non-metallic material.
- C: An electrical disconnect for all power in the fountain equipment vault shall be provided external to the vault and near the entrance to the vault. If this is not practical, a shunt-trip mechanism for the power feed at the main panel board or load center shall be provided with control stations at the entrance to the vault and inside the vault near the entrance.
- C: A sign shall be posted at the entrance to the vault indicating the location of the electrical disconnect(s) for all fountain vault power.
- C: No voltages higher than 480-Volts shall be allowed inside fountain vaults.
- C: All panel boards and load centers shall have bus bar feed connections at the top of the enclosure, not at the bottom.
- C: All electrical equipment shall be mounted as high as practical on the walls of the equipment vault and in compliance with NEC requirements for maximum height. In no case shall electrical equipment be located within 18" of the floor.
- C: At least one GFCI receptacle(s) on a separate 20-Amp circuit shall be provided for maintenance purposes inside the vault and mounted at 48" height.
- C: All conduit penetrations of fountain vault concrete shall be properly grouted to prevent water seepage. Spray-in foam insulation is not acceptable.
- All pumps shall be mounted a minimum of one foot off the floor. Service pads shall be provided for all pumps.
- Full-size copper grounds shall be used for all equipment and circuits; conduit grounds are not acceptable.
- Shared neutrals are not acceptable wiring practice for single-phase circuits; every circuit must have an associated neutral wire. Two pole and three pole breakers servicing individual pieces of equipment may use a single neutral wire.
- All operating equipment shall be protected with safety disconnects.
- Motor controllers and fused safety switches shall be used to protect pump motors. If a VFD is installed, it will substitute for the motor controller.
- All electrical equipment shall be labeled with permanent labels that match the designations used on the construction drawings.

#### Fountain Lighting

- C: All fountain lighting shall be UL listed for underwater use unless it is distant from the fountain basin and water features.
- C: All fountain lighting shall be equipped with factory-installed cordsets long enough to reach to a junction box.

#### Vault Environmental

- Decking and other thick materials on the floor of the vault that would trap water are to be avoided. Safety coatings, treads and other anti-slip treatments are recommended.
- C: All vault lighting shall be wet-location fluorescent fixtures with electronic ballasts and T-8 lamps. Sufficient lighting should be installed to illuminate all equipment areas and walkways. The recommended level in all equipment areas is 30-foot candles at floor level. A wet location light switch shall be located at the vault entrance.
- Safety railings, grab bars and other protective devices shall be installed, as needed, to provide a safe operating environment for maintenance personnel.
- One or more electrical unit heaters shall be permanently installed, sized to maintain a minimum temperature of 40-degrees at 18" off the floor. An external thermostat with clear markings shall be installed at a height of 36" off the floor.
- A fresh-air ventilation system shall be installed with a minimum airflow of 350-cfm. This fan shall be thermostatically controlled to turn off if the incoming air is below 45 degrees. Fans should operate at all times to keep the air in the vault from becoming stagnant. Air intakes should not be located where fountain spray will humidify the incoming air. A suitable air discharge vent shall be installed.
- Emergency lighting pack(s) shall be installed to facilitate safe personnel exit in case of a power failure.

#### Water Alarms

- A water sensor and alarm shall be installed that will provide indication of water on the floor of the vault in excess of one inch.
- If practical, provision shall be made for a telephone line to be brought into the fountain vault for remote alarm monitoring.
- A visible and audible water alarm shall be installed external to the fountain vault when practical.

#### Miscellaneous

- Prints of as-built drawings shall be submitted for archival purposes
- Copies of all fountain-related drawings shall be submitted in an electronic file format compatible with AutoCad .dwg files.





Fountain	Park	Description
City Park Interactive Water Feature	City Park	
Thatcher Fountain	City Park	This bronze and granite fountain, located in City Park, was designed by Chicago Sculptor Laredo Taft. Joseph Thatcher purchased the fountain as a gift to the city in 1917 for \$100,000. It was supposed to be put in Civic Center Park, but the people of Denver decided to put it in City Park instead. The three bronze assemblies of the fountain represent the virtues of the state: Loyalty, Learning, and Love.
Babi Yar	Babi Yar	
Benedict Fountain	Benedict Park	Located at 20th & Logan, this fountain was purchased by J.B.Benedict, an architect who donated it to the City. It was designed by Maurice Bardin of France and dedicated in 1932.
Hungarian Freedom	Hungarian Freedom Park	
Seal Fountain	Civic Center	This fountain, located in Civic Center Park, depicts kids sitting on the backs of seals, with the seals spouting water. It was created by Robert Garrison in 1922. Although it is in good shape mechanically, its popularity with skateboarders has left it with some needed work.
Stapleton Interactive Water Feature	Central Park	
Cheesman Fountain	Cheesman Park	Built in 1910 by George Kessler, a landscape architect from Kansas City, this fountain was fully restored in 1999 at a cost of \$500,000.
Pioneer Fountain	Monument Park	At the intersection of Colfax & Broadway, sits the Pioneer Fountain. This fountain was supposed to honor the early Europeans. The sculptor, Frederic MacMonnies of Paris, originally proposed an Indian standing on top of the fountain. But, the people of Denver were outraged that an Indian would be honored along with the pioneers. He ended up replacing the Indian with "Kit Carson on horseback."
Cherry Creek 1	Cherry Creek at x	
Cherry Creek 2	Cherry Creek at y	
Sullivan Fountain	City Park	Sometimes called the Sullivan Fountain, given in honor of Dennis Sullivan by a friend, it was purchased in 1917 for \$35,000 and is located in front of East High School. Good care was not taken of the fountain, and it stopped functioning in 1955. Denver Parks & Recreation, with the help of the Denver Water Department, restored it four years ago at a cost of \$500,000. It was designed Chicagoan Edward Bennett.
Creekfront Fountain	Creekfront Park	
Beaumont Fountain	Beaumont Park	
Skyline Park Fountain	Skyline Park	
Skyline Park Fountain	Skyline Park	
Children's Fountain	City Park	Located in City Park, this marble fountain was purchased in 1912 by Mayor Speer. Mayor Speer went to Dusseldorf, Germany, saw the fountain, and decided Denver needed one. Mayor Speer tracked down the French sculptor, May Blodet, and commissioned another for Denver. It was restored 5 years ago.
Electric Fountain	City Park	

Year	TITLE OF ART WORK	ARTIST(S)	LOCATION
0	Abundant Joy	Gerald Balciar	Denver Zoo
0	Arctic Sojourn	Kenneth Bunn	Denver Zoo
0	Frog	Susan Raymond	Denver Zoo
0	Pool Mural	Jerry Jaramillo	La Familia
0	Rima/ Bird Lady	Edgar Britton	Denver Botanic Garden
0	Two Cranes	Unknown	Denver Botanic Garden
1898	The Boy and a Frog	Elsie Ward Hering	Denver Botanic Garden
1906	Sundial	Unknown	City Park
1909	Robert Burns Memorial	Grant Stevenson	City Park
1912	Children's Fountain	Max Blondet	City Park
1918	Joseph Addison Thatcher Memorial	Lorado Taft	City Park
1919	Wynken, Blynken & Nod	Mabel Landrum Torrey	Washington Park
1920	Broncho Buster	Alexander Phimister Proctor	Civic Center Park
1920	Elk Group and Buffalo	Allen True	Civic Center Park
1920	The Trapper	Allen True	Civic Center Park
1920	The Prospector	Allen True	Civic Center Park
1922	On The War Trail	Alexander Phimister Proctor	Civic Center Park
1922	Sea Lions Fountain	Robert Garrison	Civic Center Park
1925-1906	Elizabeth Allen Sopris Mem;Sundial and Flagpole	Unknown	City Park
1925-26	The Story of a Pike's Peaker	Robert Garrison	Denver Botanic Garden
1930	Grizzly's Last Stand	Louis Paul Jones	City Park
1932	Benedict Fountain	Maurice Bardin	Hungarian Park
1953	Fountain	Edgar Britton	Denver Botanic Garden
1961	Elephant Mural	Eva Brand	Denver Zoo
1961	Waterhole Mural	Eva Brand	Denver Zoo
1962	Seal Fountain	Louis Paul Jones	Cherry Creek (1st & University triangle)
1965	Unknown (Red Abstract "U")	Anthony Magar	Denver Zoo
1965	Bears	Louis Paul Jones	Cranmer Park
1968	Homage To The Pioneer	Susan Pogzeba	Burns Park
1968	Unknown	Roger Kotoske	Burns Park
1968	Burns Park, 18'	Wilbert Verhelst	Hungarian Park
1968	Unknown	Robert Morris	Burns Park
1969	Unknown	Angelo DiBenidetto	Burns Park
1969	Unknown (Dedicated To Martin Luther King Jr.)	Anthony Magar	Civic Center Park
1971	Eyes On The Park	Emanuel Martinez	Curtis-Mestizo Park
1971	Feature Fountain	Elanor Kinsman	Denver Botanic Garden
1972	Unknown (Redwood Fan)	Abe Vigil	Governor's Park
1976	Steel Street Fountain	Gary Dwyer	Cherry Creek Park
1976	Martin Luther King Jr., Prophet For Peace	Ed Rose	City Park
1976	General Pulaski Monument	Zbigniew Maleszewski	Pulaski Park
1977	The Sentinel (Pronghorn)	Kenneth Bunn	City Park
1977	The Gorilla	Kenneth Bunn	Denver Zoo
1978	La Alma Mural	Emanuel Martinez	La Alma Recreation Center
1980	Colorado Miner	George Carlson	Washington Park
1980	Scripture Gardens	William F. Joseph	Denver Botanic Garden
1981	Golden Eagle Sculpture	T.H. Dickson	Denver Zoo
1983	Babi Yar Park	Satoru Nishita	Babi Yar Park
1988	Cares For Her Brother	Veryl Goodnight	Denver Zoo
1988	When Legends Run Free (Running Wolves)	William Frederick Sargent	Museum of Natural History

Year	TITLE OF ART WORK	ARTIST(S)	LOCATION
1989	Hogback	Elaine Calzolari	Cherry Creek Park
1991	Water Friends and At Play (2 pieces)	Julie Burrington	Congress Park Pool
1991	Parked Perspectives	Susan Cooper	Congress Park Pool
1991	Medalions	John Boak	Harvard Gulch Rec. Center
1991	Juntos/Together	Tony Ortego	Lakewood Dry Gulch Park
1991	Ode to the West Wind	George Woodman	Temple Buell Theatre
1991	Come on in!	Jim Sale	Washington Park Rec Center
1993	Personal Icons	Barry Rose	City Park Pavillion
1993	Continuum	Clay Wright	20th St. Rec. Center
1993	Berkeley Park: Past and Present	Randi Eyre	Berkeley Park Pool
1993	Petros	Bill Gian.	Creekfront Park
1993	Drums of Peace and Dignity	Nick Vigil	Russell Square Park
1993	Backward Somersault	Emanuel Martinez	Southwest Rec Center
1993	Family and Community Fun	Nick Vigil	St. Charles Recreation Center
1994	Clear Concept	Sherry Allen	Berkeley Park
1994	First Round	JoeSam.	Kennedy Golf Course
1997	3 Wild Spaces	Andrew Dufford	Goldsmith Gulch-3 locations
1998	Full Play	Barbara Baer	Cook Park
1998	Earth, Air, Fire, & Water	Nancy Lovendahl	Rockmont Park-Cuernavaca Park
2000	TBA	Tony Ortega/Maureen Auman	Northside Park- North Platte Reclamation
2001	Martin Luther King Jr. Monument	Ed Dwight	City Park - Martin Luther King, Jr. Sculpture
2002	Silver Sky	Dayton Claudio	East Denver Swimming Pool -Lowry/Montclair
2003	Portrait of William Scheitler	Steve Altman	Skyline Park Recreation Center
2003	Portrait of Hiwatha Davis ( at Hiawatha)	Robert Evans	Hiawatha Davis Rec. Center
2003	Meeting of the Minds	Douglas Kornfeld	City Park Golf Clubhouse
2003	Davis in Motion	Gary Emrich	Hiawatha Davis Rec. Center
2003	Red Rocks sceneries	Andrew Reid	Red Rocks Amphitheater
2003	Red Rocks sceneries	Stephen Batura	Red Rocks Amphitheater
2003	Red Rocks sceneries	Joellyn Duesberry	Red Rocks Amphitheater
2003	Red Rocks sceneries	Christy Wyckoff	Red Rocks Amphitheater
2003	Red Rocks sceneries	Buffalo Kaplinski	Red Rocks Amphitheater
2003	Red Rocks sceneries	Carol Fitzgerald	Red Rocks Amphitheater
2003	Red Rocks sceneries	Jim Colbert	Red Rocks Amphitheater
2003	Red Rocks sceneries	William Stockman	Red Rocks Amphitheater
2003	Red Rocks s	Judith Trager	Red Rocks Amphitheater
2003	Swimming under the Trees & Autumn Leaves	Shan Shan Sheng	Rude Park Recreation Center
2004	Aqua Portal	Don Lawler & Meg White	Ashland Recreation Center
2004	TBA	Kristine Smock	Sloan's Lake Park
2005	TBA	Alice Aycock	Montbello Projects/Chambers Road
2005	Prairie Dogs	Judith Stewart	Green Valley Ranch Recreation Center
2005	TBA	John Davis	Skate Park
2005	TBA	Ann Weber	Skyline Park
2006	TBA	Li Hardison	MLK Improvement Project

---

## Executive Orders for Standards Appendix N

XO #	Description
3	Motor Vehicle Program for the City and County of Denver
8	Contracts and other Written Instruments of and for the City and County of Denver
15	Review process for Applications for Federal, State or Private Funds.
16	Use of Electronic Communication Devices and Services
20	Payment of Water and Sewage Bills
25	Vehicle Use Policies
33	Requesting and Purchasing Under Centralized Purchasing Services
33(sic)	Memorandums
46	State of Colorado Sales and Use Tax Exemption (regarding construction and building materials)
52	Use of Central Services Division
55	Department Information Centers
62	Preparation of Letters for Mayor's Signature, and Procedures for Response to Mayor Referral Letters
65	Operational Safety and Health Program
66	Submission of Matters for City Council Consideration
72	Control of Centralized Utilities and Utility Services
74	Parking by City Employees While on Official City Business (OCB)
100	City Owned and Leased Real Estate: Acquisition, Disposition, Leasing, and Facility management, Space Planning and Programming.
101	Affirmative Action in Equal Employment Opportunity Provisions of City Contracts
123	Greenprint Denver Office and Sustainability Policy
127	Establishment of a Coordinated Plan to Address West Nile Virus Issues

---

## **EXECUTIVE ORDER NO. 123**

**TO:** All Agencies Under the Mayor  
**FROM:** John W. Hickenlooper, Mayor  
**DATE:** October 24, 2007  
**SUBJECT:** Greenprint Denver Office and Sustainability Policy

**PURPOSE:** This Executive Order creates the Greenprint Denver Office from the existing Greenprint Denver initiative and establishes the sustainability policy for the City and County of Denver. The following Executive Orders and Memoranda are hereby canceled and superseded by this Executive Order, dated October 24, 2007: Executive Order 87, dated March 2, 1993; Executive Order 108, dated January 7, 1997; Executive Order 120, dated February 5, 1980; and Executive Order 123, dated May 20, 2003.

The applicable authority relevant to the provisions and requirements of this Executive Order 123 is found in Section 2.2.10 of the 2002 Revised Charter.

This Executive Order is divided into the following chapters and subjects:

Chapter 1 – Greenprint Denver Office  
Chapter 2 – Green Building and Energy Conservation  
Chapter 3 – Vehicle Replacement and Operation  
Chapter 4 – Materials and Waste Management  
Chapter 5 – Water Conservation  
Chapter 6 – Environmental Public Health Policy  
Chapter 7 – Memorandum Attachments

Chapter 1 – Greenprint Denver Office

- 1.0 The mission of the Greenprint Denver Office is to position Denver as a national leader in sustainability by developing and implementing solutions to resource challenges that meet the needs of current Denver residents while securing the economic, social, and environmental health of future generations.
- 1.1 The following functions shall be the responsibility of the Greenprint Denver Office:
  - a. Promote sustainability as a core business value in City government to seek efficiencies in resource use, reduce environmental impacts, and invoke cultural change.
  - b. Work with City agencies and promote interagency cooperation to adapt operational and administrative processes towards accomplishment of sustainability goals. City government targets can be found in Memorandum 123-A of this Executive Order.

# Better Denver Program – Project Sustainability Form

<b>Section 1</b>	Project Lead:	Date:
	Project Manager:	
	Project Title:	Project Number:
	Location/Address:	Purpose Number:
	Council District:	Ballot Issue Number:
Neighborhood:		



<b>Section 2</b>	<b>Brief Work Scope Description</b>

Note: See related Project Sustainability Form instructions at [Better Denver Program Project Sustainability Form Instructions](#) and the “Review Process” at [Better Denver Program Sustainability Committee Description](#).

<b>Section 3 - Horizontal Projects</b>		
Horizontal Requirements	Will meet requirement? If “Not Applicable” please explain.	Comments
3.1 <b>Fly Ash:</b> Use a minimum of 20% by volume of fly ash in concrete per current revision of the Standard Specifications.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.2 <b>Building Materials:</b> Use materials with recycled content of at least 10% (based on cost) of the total value of the materials in the project per LEED-NC, ver. 2.2, Materials & Resources (MR) Credit 4.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.3 <b>Construction and Demolition Debris:</b> Recycle and/or salvage with a goal of 50% (by weight or volume) of non-hazardous construction and demolition debris per LEED-NC, ver. 2.2, MR Credit 2.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.4 <b>Water Efficiency - Landscaping:</b> Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case per LEED-NC, ver. 2.2, Water Efficiency (WE) Credit 1.1., and/or use a water budget of 10 gallons per square foot of landscaped area per season.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.5 <b>Light Pollution Reduction – Exterior:</b> Only light exterior areas as required for safety and comfort per LEED-NC, ver. 2.2, Sustainable Sites (SS) Credit 8.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.6 <b>Stormwater Design - Quantity:</b> Control runoff, reduce impervious cover, and promote infiltration per LEED-NC, ver. 2.2, SS Credit 6.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.7 <b>Stormwater Design - Quality:</b> Capture/treat runoff per LEED-NC, ver. 2.2, SS Credit 6.2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.8 <b>Regional Materials:</b> Use a minimum of 10% (based on cost) of regional building materials per LEED-NC, ver. 2.2, MR Credit 5.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.9 <b>Protect or Restore Habitat:</b> Restore or protect a minimum of 50% of the site area with native or naturalized vegetation per LEED-NC, ver. 2.2, SS Credit 5.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.10 <b>Rapidly Renewable Materials:</b> Use rapidly renewable materials or products for 2.5% of the total value of the project per LEED-NC, ver. 2.2, MR Credit 6.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.11 <b>Infrastructure Energy Efficiency:</b> Design or purchase equipment to achieve a 15% energy reduction per LEED-ND, Feb. 2007 pilot version, Green Construction & Technology (GCT) Credit 15.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
3.12 <b>Innovation: Describe other sustainable approaches or benefits of the project not already specifically addressed.</b>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	

Unless otherwise specified at the end of the document, printed copies of this document are UNCONTROLLED. Always refer to the online EMS document library prior to use to ensure you are using the most current version.

# Better Denver Program – Project Sustainability Form

Section 4 – Vertical Projects		
Vertical Requirements	Will meet requirement? If “Not Applicable” please explain.	Comments
4.1 <u>Fly Ash</u> : Utilize a minimum of 20% by volume of fly ash in concrete per current revisions the Standard Specifications.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.2 <u>Building Materials</u> : Use materials with recycled content of at least 10% (based on cost) of the total value of the materials in the project per LEED-NC, ver. 2.2, Materials & Resources (MR) Credit 4.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.3 <u>Construction and Demolition Debris</u> : Recycle and/or salvage with a goal of 50% (by weight or volume) of non-hazardous construction and demolition debris per LEED-NC, ver. 2.2, MR Credit 2.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.4 <u>Water Efficiency - Landscaping</u> : Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case per LEED-NC, ver. 2.2, Water Efficiency (WE) Credit 1.1., and/or use a water budget of 10 gallons per square foot of landscaped area per season.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.5 <u>Water Efficiency - Fixtures</u> : Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Act of 1992 fixture performance requirements per LEED-NC, ver. 2.2, WE Credit 3.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.6 <u>Wastewater</u> : Reduce potable water use for building sewage conveyance by 50% through the use of the water-conserving fixtures or non-potable water per LEED-NC, ver. 2.2, WE Credit 2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.7 <u>Stormwater Design</u> : Control runoff and reduce impervious cover, promote infiltration and capture/treat runoff per LEED-NC, ver. 2.2, Sustainable Sites (SS) Credit 6.1 and 6.2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.8 <u>Light Pollution Reduction – Interior</u> : Minimize interior after hours lighting per LEED-NC, ver. 2.2, SS Credit 8 regarding after hours interior lighting.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.9 <u>Light Pollution Reduction – Exterior</u> : Only light areas as required for safety and comfort per LEED-NC, ver. 2.2, SS Credit 8 regarding exterior lighting.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.10 <u>Energy – Commissioning</u> : Ensure fundamental commissioning of building energy systems and enhanced commissioning per LEED-NC, ver. 2.2, Energy & Atmosphere (EA) Prerequisite 1 and Credit 3.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.11 <u>Energy – Energy Star</u> : For eligible building types, design to earn the “ENERGY STAR.” For eligible equipment types, use “ENERGY STAR” labeled equipment. For more information see <a href="http://www.energystar.gov">www.energystar.gov</a> .	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.12 <u>Energy – Optimize Energy Performance</u> : Earn at least 6 points (includes 2 mandatory points required for all projects registered after 6/26/07) by achieving an increased level of energy performance above the baseline established by ASHRAE/IESNA Standard 90.1-2004 per LEED-NC, ver. 2.2, EA Credit 1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.13 <u>Energy – Building Orientation</u> : Orient and design building to maximize use of passive solar and day lighting.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.14 <u>Energy – Renewable Energy</u> : Incorporate photovoltaic or other renewable energy technologies per LEED-NC, ver. 2.2, EA Credit 2, or prepare for future installations by pre-wiring building and designing for increased structural load.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	

Unless otherwise specified at the end of the document, printed copies of this document are UNCONTROLLED. Always refer to the online EMS document library prior to use to ensure you are using the most current version.

# Better Denver Program – Project Sustainability Form

Section 4 – Vertical Projects		
Vertical Requirements	Will meet requirement? If “Not Applicable” please explain.	Comments
4.15 <u>Construction IAQ Management Plan</u> : Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building per LEED-NC, ver. 2.2, Indoor Environmental Quality (EQ) Credit 3.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.16 <u>Low-Emitting Adhesives and Sealants</u> : All adhesives and sealants used on the interior of the building shall comply with LEED-NC, ver. 2.2, EQ Credit 4.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.17 <u>Low-Emitting Paints and Coatings</u> : All paint and coatings used on the interior of the building shall comply with LEED-NC, ver. 2.2, EQ Credit 4.2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.18 <u>Low-Emitting Carpet Systems</u> : All carpet systems installed in the interior of the building shall comply with LEED-NC, ver. 2.2, EQ Credit 4.3.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.19 <u>Low-Emitting Composite Wood and Agrifibers</u> : All composite wood and agrifibers used on the interior of the building shall comply with LEED-NC, ver. 2.2, EQ Credit 4.4.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.20 <u>Rapidly Renewable Materials</u> : Use rapidly renewable materials or products for 2.5% of the total value of the project per LEED-NC, ver. 2.2, MR Credit 6.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.21 <u>Open Space</u> : Maximize open space per LEED-NC, ver. 2.2, SS Credit 5.2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.22 <u>Regional Materials</u> : Use a minimum of 10% (based on cost) of regional building materials per LEED-NC, ver. 2.2, MR Credit 5.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.23 <u>Heat Island</u> : Reduce heat island per LEED-NC, ver. 2.2, SS Credit 7.1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.24 <u>Minimize Site Disturbance – Site Design</u> : Minimize site disturbance through site design per LEED-ND, Feb. 2007 pilot version, Green Construction & Technology (GCT) GCT Credit 6.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.25 <u>Minimize Site Disturbance – Site Design</u> : Minimize site disturbance during construction per LEED-ND, Feb. 2007 pilot version, GCT Credit 7.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.26 <u>Storage &amp; Collection of Recyclables</u> : Provide an easily accessible area that serves the entire building for the storage and collection of recyclables per LEED-NC, ver. 2.2, MR Prerequisite 1.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.27 <b>Innovation: Describe other sustainable approaches or benefits of the project not already specifically addressed.</b>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
<b>Additional vertical requirements for:</b>  <input type="checkbox"/> <b>All New Building Projects of 5,000 square feet or more.</b>  <b>And/or...</b>  <input type="checkbox"/> <b>Major Renovations where useful life is greater than 15 yrs <i>and</i> that affect more than 25% of a building’s square footage <i>or</i> that include a major HVAC renovation, envelope modification and interior rehabilitation.</b>		
4.28 <u>Baseline Requirements</u> : Address the requirements stated above, items 4.1 – 4.23.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	
4.29 <u>LEED-NC Silver</u> : Achieve LEED-NC “Silver” status per LEED-NC, ver. 2.2.	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	

Unless otherwise specified at the end of the document, printed copies of this document are UNCONTROLLED. Always refer to the online EMS document library prior to use to ensure you are using the most current version.

## **Better Denver Program – Project Sustainability Form**

Section 5.a. (Reserved for internal administration)			

Section 5.b. (Reserved for EMS document information)	
<b>Title:</b>	<i>Better Denver Program Project Sustainability Form</i>
<b>Document Identification Number:</b>	CCD-304.02.01
<b>Version:</b>	Version 2.0
<b>Revision Date:</b>	July 29, 2008
<b>Document Owner:</b>	Cindy Bosco, <i>Greenprint Denver</i>
<b>Controlled Copy Location:</b>	Not applicable.

Unless otherwise specified at the end of the document, printed copies of this document are UNCONTROLLED. Always refer to the online EMS document library prior to use to ensure you are using the most current version.