

Washington County Pedestrian Enhancements Design Guidelines

June 2005

Washington County Department of Land Use & Transportation

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This document is built upon the policies and strategies together with the analyses of pedestrian conditions, needs and recommended improvements that were developed as part of the 2020 Washington County Transportation Plan, adopted in October 2002.

Contents

Chapter One: Introduction

<i>Context & Background</i>	1
<i>Intent & Purpose</i>	1
<i>Using the Guidelines</i>	2

Chapter Two: Pedestrian Environment – Guidelines

<i>The Pedestrian Environment/Sidewalk Zones</i>	3
<i>Pedestrian Enhancements:</i>	
<i>Landscaping.....</i>	4
<i>Lighting</i>	4
<i>Streetscape Furnishings.....</i>	5
<i>Crossing Treatments.....</i>	6
<i>Sidewalk Widths & Designs.....</i>	9

June 2005

Chapter 1 – Introduction

Context & Background

Washington County adopted its 2020 Transportation Plan in October of 2002. The plan greatly elevates the importance of pedestrian travel when compared with the previous (1988) Transportation Plan. The 2020 Transportation Plan emphasizes development of an urban pedestrian network that will help support Comprehensive Plan policies that are intended to create mixed-use environments that are well suited to pedestrian travel.

To help achieve this goal, the 2020 Transportation Plan identifies Light Rail Station Communities, Regional and Town Centers, Transit Corridors and Main Streets as areas where enhanced pedestrian facilities are appropriate (see Policy 14.0 – Pedestrian Element of Washington County’s 2020 Transportation Plan for additional detail). The adopted policies and strategies of the 2020 Transportation Plan were developed with extensive public involvement. This Design Guideline is intended to help facilitate implementation of the concepts outlined in the Plan.

At the time this design guideline booklet was developed, land use planning had been completed in unincorporated Washington County for the Cedar Mill Town Center, the Washington Square Regional Center and Light Rail Station Communities. Some areas in unincorporated Washington County that are planned for enhanced pedestrian facilities in the 2020 Transportation Plan, such as Transit Corridors, Main Streets and the remaining Town and Regional Centers, do not yet have adopted land-use plans that implement these 2040 designations.

Areas of unincorporated Washington County with adopted land use plans implementing 2040 guidelines are subject to provisions of the Community Development Code, Community Plans and County Road standards that require various pedestrian amenities in conjunction with new development. In most cases these amenities are referenced in general terms such as ‘pedestrian-scale lighting’ or ‘street furniture’.

This Pedestrian Enhancements Design Guideline Booklet provides for a greater degree of continuity for pedestrian enhancements on a community-wide basis. Additionally, the design recommendations included herein are intended to facilitate ease of maintenance, resistance to vandalism, and cost effectiveness.

Intent & Purpose

This design reference is intended as a guideline for pedestrian enhancements called for by provisions of the 2020 Transportation Plan and the Community Development Code. The designs included in this booklet are intended as recommendations for improvements in public easements and rights-of-way and are not intended to be used as prescriptive standards.

The design guidelines must be flexible so that designs can be tailored to unique circumstances and accommodate new technologies as they continue to emerge. At the same time, continuity of design is an important consideration because it often supports the following desired principles: Safety, cost-effectiveness, community identity, ease of maintenance, practicality in implementation and resistance to vandalism. With these principles in mind, the County Engineer will have the authority to approve design proposals other than those outlined in these guidelines when they are consistent with one or more of these principles.

Design of improvements on state highways must address ODOT's *Oregon Highway Design Manual* standards. All proposed improvements on state highways must be reviewed and approved by the Oregon Department of Transportation.

As mentioned previously, these guidelines are intended to provide designs that will help foster a safer, more convenient and more attractive pedestrian environment as provided for in the County's Comprehensive Framework Plan and the 2020 Transportation Plan. Implicit in these guidelines is the recognition that constraints in the built environment may preclude or seriously limit the use of enhancements and that undeveloped sites are generally less constrained and may offer greater opportunity for implementing appropriate pedestrian amenities. From time to time, these guidelines may be revised or amended in order to provide for changing circumstances and innovative design technologies as they continue to emerge.

Using the Guidelines

These design guidelines include recommendations for use of the pedestrian realm generally (sidewalk zones) as well as landscaping, sidewalk design, crossing treatments, street furniture and lighting. For some features, there are existing minimum requirements in the Community Development Code and the Washington County Uniform Road Improvement Design Standards. The design guidelines that follow may be used to help identify and implement various treatments that are required by the Code but where specific, prescriptive standards are not adopted. In all cases, plans must be reviewed through the County Engineering Division's design review process and treatments not included in these guidelines that are consistent with the previously stated principles may be considered.

Chapter 2 – Pedestrian Environment – Guidelines

The Pedestrian Environment: General Principles

Policy 14.0 of the Washington County 2020 Transportation Plan and its accompanying strategies together with Technical Appendix C-2 of the Plan describe the priorities for the overall pedestrian network. Important considerations that are identified include the following:

- Safety – including illumination
- Connectivity
- System coverage
- Ease of street crossing
- Providing continuity in community design
- Providing for ease of maintenance, resistance to vandalism, value and durability
- Accessibility – providing connections to pedestrian attractors

These factors should always be kept in mind in considering any pedestrian enhancement designs.

As described in the Pedestrian Element of the Plan (Strategies 14.8 and 14.9) in areas where pedestrian enhancements are called for, wider sidewalks are appropriate. Technical Appendix C-2 calls for sidewalks of at least seven feet in areas with businesses or other pedestrian attractors (such as a transit line) and in 2040 centers and Station Communities widths in excess of seven feet. The plan also calls for consideration of crossing improvements in areas with strong pedestrian attractors, streetscape improvements (landscaping, street furniture and other features) as suggested in Metro's *Creating Livable Streets: Street Design Guidelines for 2040*. Metro's guidelines have been given strong consideration in developing the recommendations in this design booklet.

The Pedestrian Realm – Zonal Attributes

Generally, pedestrian zones have the following sub-zones:

- ***The curb zone:*** Area where the curb is set. Curb standards are found in the Washington County Uniform Road Improvement Design Standards (WCURIDS).
- ***The landscaping & furnishings zone:*** Located immediately behind the curb, this is a minimum 4-foot wide area where landscaping (landscape strips or planters such as tree wells) and various street furnishings (bus shelters, benches, controller boxes, etc.) should be placed.
- ***The pedestrian travelway (i.e., sidewalk) zone:*** Located between the landscape/furnishings zone and the 'frontage zone' (see below), this is the unobstructed area intended for pedestrian travel.
- ***The frontage zone:*** Located between the pedestrian travelway zone and the property line/back of sidewalk. In areas where no landscaping/furnishings zone exists, elements that would be sited in that zone may be placed in the frontage zone except where such elements would block access to existing or future buildings. Private temporary uses, such as outdoor seating for restaurants, where permitted, may occupy the frontage zone provided the pedestrian travelway zone is maintained.

The attached sample roadway cross-section drawings (from Appendix B-8) can be used to help identify the above zones.

Constraints

In many cases, constraints exist within the pedestrian zones that limit the accommodation of various elements. In some cases, these constraints can be minimized through design. Constraints include topographic features, pre-existing development, wetlands, utilities, etc. Limited right-of-way is not intended to be considered a constraint when additional dedication is legally justifiable.

For example, street trees in tree wells can be used in place of a continuous planter strip to allow for siting of street furnishings and a wider sidewalk. Other constrained areas will require different solutions such as siting a bench or other desired street furnishing at the back of the walkway (in the frontage zone), in an easement or on private property. Because so many variables exist in constrained situations, it may not be possible to accommodate all the desired uses or attributes in the pedestrian realm. The County Engineer shall have ultimate discretion to approve design proposals.

Pedestrian Enhancements

Landscaping

Street trees are a valuable part of an attractive, inviting pedestrian environment. Inside the Urban Growth Boundary, street trees are required in conjunction with most types of new development by CDC Sections 407-7 and 431-5.1B.(2), which include placement and spacing requirements.

For all new road projects landscaping should be considered along streets located within Pedestrian Districts, Transit Corridors, Main Streets, and Streetscape Improvement Areas shown on the Washington County 2020 Transportation Plan Pedestrian System Map (Figures 12B through E) as well as along roadways and intersections identified on the Regional Street Design Overlay Map (Figure 3).

Attachment “A” is a list of recommended street trees that may be used in areas that are slated for enhanced pedestrian facilities. Other street trees, including conifers, may be used upon approval of the County Engineer. Where conditions permit, use of broad canopy trees, rather than columnar or sentry trees should be considered.

Pedestrian Scale Lighting

Adequate street lighting is important to pedestrian safety. Lighting should be provided on sidewalks as well as streets, particularly at intersections and key crossing locations. Pedestrian scale lighting characteristics and recommendations include the following:

- Lower than ‘Cobra Head’ (CH) lights, pedestrian scale lighting should be less than 20 feet in height, should be located below tree canopy and should provide more continuous and uniform lighting of pedestrian facilities than traditional ‘CH’ lights. Designs for poles and fixtures to provide for consistency in lighting (i.e., uniform design will be required locally) and must be consistent with Portland General Electric (PGE) Option “B” materials, installation requirements and workmanship.
- Use only lighting that meets PGE’s *Approved Street Lighting Equipment* and that is consistent with PGE’s *Statement of Streetlight Installation Responsibilities*.
- Avoid over-lighting, light trespass and glare – consider lighting levels of 2.5 foot-candles in commercial areas to 0.20 foot-candles on streets abutting residential uses.

- Provision of lighting plans that show coverage and type of illumination, lighting levels, fixture type and design is recommended.
- Overall illumination requirements for streets and roadways need to be met but may be satisfied with pedestrian scale lighting provided it meets overall illumination requirements.
- Placement of pedestrian scale lighting should generally be centered in the landscaping and furnishings zone; there may be instances where supplemental pedestrian scale lighting, such as bollard-type lights, may be placed elsewhere, such as behind the sidewalk. Poles and lights should be aligned along street corridors.
- Consider light color (bulb type) and favor lighting with higher color rendition index when possible.

Streetscape Furnishings

Streetscape furnishings should be provided in areas of existing or expected high pedestrian use. Such areas are identified in the Washington County 2020 Transportation Plan as Pedestrian Districts and Streetscape Improvement Areas (see Figures 12B through E). Streetscape elements provide a human-scale to the environment and encourage walking. Streetscape furnishings include features such as benches, trash receptacles, drinking fountains, bus shelters, and information kiosks. Recommended placement of streetscape furnishings should be determined in conjunction with the land development review process. In order to maximize design continuity, facilitate ease of maintenance and maximize cost-effectiveness, Washington County has developed the following design recommendations and principles for Streetscape Furnishings:

Street Furniture Requirements

ITEM	SPECIFICATIONS	APPROVED PRODUCTS
Bench (see Attachment "B" for drawing)	Flat-bar slats, welded,length 6'-0", surface-mounted bolts, powder-coated with polyester, black color	Cascadia bench by Creative Pipe, RB-28 by Victor Stanley, Promenade by Urban Accessories, or approved equal.
Litter receptacle (see Attachment "C" for drawing)	Flat-bar slats, 36-gallon, flat steel top with elevated canopy, surface-mounted bolts, powder-coated with polyester, black color	Cascadia trash receptacle by Creative pipe, S-42 or RB-36 by Victor Stanley, RR-SS Trash by Urban Accessories
Bike Rack	Surface-mounted bolts, polyester powder-coated, black color	WU20-30" by Creative Pipe, BK-3 by Victor Stanley, Bike Rail by Urban Accessories, or approved equal.
Tree Grate	Cast iron, ADA compliant	STA 4872 by FairWeather, Sunrise by Ironsmith, or approved equal.
Bollard	Cast iron or aluminum 35: height, 6" diameter minimum, removable, locking, black color	Omni-Stop by Coral Sales, Salem by Ironsmith, or approved equal.

Design Principles

- Benches should be constructed of vandalism resistant materials such as those identified above or in the drawing that is included as Attachment “B”. Center armrests should be considered to discourage use of benches for sleeping.
- Trash receptacles should be centered within the landscaping and furnishings zone when this zone is at least 3’0” wide. Consider alternative design style to maintain necessary clearances.
- Drinking fountains are permissible and should be maintained by the adjacent property owner. Maintenance/operation agreements with property owners should be executed. Placement should not interfere with required clear zones, sight distances, etc.
- Kiosks are permissible and should be maintained by the adjacent property owner. Maintenance/operation agreements between the property owner/operator of kiosk and the county should be required. Placement should not interfere with required clear zones, sight distances, etc.
- Furnishings should be placed in the landscaping and furnishings zone and should not interfere with the pedestrian travelway zone. Maintenance of furnishings should typically be the responsibility of the adjacent property owner.

Crossing Treatments

Safe street crossings are an essential component of a pedestrian network. They are especially important in Light Rail Station Communities, Regional and Town Centers, Transit Corridors and Main Streets, all of which are areas identified for pedestrian enhancements in the Transportation Plan.

While traditional marked crosswalks can be used in many locations, there are a number of alternative crossing treatments that improve pedestrian safety as well as the attractiveness of the pedestrian environment that may be employed in Pedestrian Districts.

A number of enhanced crossing treatments are identified below; because of the many variables in circumstances, no single ‘standard’ for pedestrian crossings is appropriate in all situations. Relevant considerations include safety, ease of maintenance, driver expectations, utility access, roadway functional classification and design speed.

The Institute of Transportation Engineers report entitled *Alternative Treatments for At-Grade Pedestrian Crossings* (Nazir Lalani and the ITE Pedestrian and Bicycle Task Force) includes a number of important considerations for assessing crossing treatment options. The county may use this report to evaluate potential crossing treatments and in considering other treatments in addition to those listed below.

Pedestrian Crossing Treatments

<i>Improvement</i>	<i>Purpose</i>	<i>Where to use</i>	<i>Considerations</i>
Pedestrian Refuge Island	To minimize pedestrian exposure during crossing by shortening crossing distance and increasing the number of gaps available for crossing.	Appropriate where roadway crossing is greater than 15 m (50 ft) or where more than three lanes; can be used anywhere to increase number of gaps. Can be used at unsignalized or signalized	At signalized locations with pedestrian actuation, provide push buttons at refuge. At right-turn slip lanes, provide pedestrian signalization

<i>Improvement</i>	<i>Purpose</i>	<i>Where to use</i>	<i>Considerations</i>
Curb Extensions See Attachment "D" for Standard Drawing	To minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing.	crosswalks. Appropriate for any crosswalk where there is a parking lane adjacent to the curb. Sometimes used to accommodate bus stops, with bus stopping in travel lane.	Unless there is a parking lane, curb extensions can be a problem for bicycle travel and truck or bus turning movements.
Mid-block Crosswalk	To provide a crossing opportunity where there is no nearby intersection.	Use where there is a demand for crossing and there is no nearby crossing. Consider using when protected intersections are spaced greater than 600 feet.	May present additional hazards to pedestrians on multi-lane roadways when not signalized.
Raised Crosswalk	To eliminate grade changes from the pedestrian route and give pedestrians greater prominence as they cross the street.	In business districts, near schools and other areas with significant pedestrian travel.	Provide tactile warnings to alert blind pedestrians when they are leaving the sidewalk and entering the roadway.
Flashing Beacons or In-Roadway Lights	To alert motorists to the presence of pedestrians in a crosswalk.	Used to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop. Use only at marked crosswalks with no traffic control devices.	Most successful when the flashing corresponds closely to actual pedestrian use, which calls for best available pedestrian detection.
Signal or Pedestrian Signal	To allocate relative time at an intersection to conflicting vehicular and pedestrian movements.	MUTCD gives warrants for installing signals based on relatively high pedestrian volumes. Consideration can be given to installing signals in locations where a demonstrated need for crossing cannot be safely accommodated with other design elements.	Recommended that the time allocated to pedestrian crossing be calculated using a design walking speed of 3.5 to 4.0 feet per second. Recommended that all pedestrian-actuated signals be accessible with audible and tactile information provided.
Colored or Textured Pavements	To better delineate crossing area boundaries to motorists and pedestrians.	At intersections of high pedestrian activity.	Maintenance and repair after utility cuts or other damage, costs.
Illumination	To ensure that pedestrians can be seen as they cross the street.	On collectors and arterial streets, with particular emphasis on crosswalks.	Streetlights should not "wash" the crosswalk but should be located at least 25 feet on either side to best illuminate or backlight a crossing pedestrian. The spectrum of light ideally should render colors well (high-pressure sodium does not).
Grade-separated Crossing Structure	To provide a crossing opportunity in which the pedestrian is completely separated from traffic.	Use only where it is not feasible to provide an at-grade pedestrian crosswalk (such as at an interstate highway, expressway, or very wide busy major arterial).	A high cost option. Recommended that all grade-separated crossing structures be accessible with elevator access, not just ramps. Excessive added travel distance will discourage pedestrians who want to take a more direct route.

<i>Improvement</i>	<i>Purpose</i>	<i>Where to use</i>	<i>Considerations</i>
Four Lane To Three Lane Conversion	To reduce the number of travel lanes to cross and provide space for pedestrian refuges.	Where a facility with four travel lanes has significant left-turn activity, a three-lane configuration can perform as well or better.	The conversion may permit adding bicycle lanes or curb extensions if there are none at present.
Traffic Calming	To slow the speed of traffic as it approaches the crosswalk.	Where to use varies with types of traffic calming measures. Some examples include mini-traffic circles, slow points, traffic diverters, chicanes, etc.	Vertical and horizontal deflection devices can slow emergency response vehicles and cause pain to people with spinal injuries (as passengers in para-transit vehicles, for example)
Reduced Curb Return Radii	To reduce crossing distance, increase queuing area for pedestrians waiting to cross, and slow vehicles as they travel through the intersection.	Where pedestrian use is high and truck and bus turning movements are low. Very short radii (1.5 m or 5 ft) can be used where a parking lane or bike lane provides an "effective turning radius" that is larger than the curb return, or on one-way streets where there are no turning movements possible.	Balance the needs of pedestrians with the need to accommodate the types of vehicles that turn at the intersection.
Parking Control	To improve visibility in the vicinity of a crosswalk.	"No Parking" may be signed for some distance back from the intersection to improve visibility.	State law prohibits parking within intersections and crosswalks unless specifically signed.
No Pedestrian Crossing	To avoid conflicts between pedestrians and traffic in situations that are particularly dangerous.	Prohibiting crossing should be considered only in very limited circumstances, such as where it would be dangerous for pedestrians to cross because visibility is obstructed, or where there are unique considerations at an intersection.	Prohibiting crossing can significantly reduce pedestrian level of service and mobility. Careful consideration should be given to pedestrian travel patterns and other solutions to improve safety before this measure is implemented.

Resource notes:

- A. Metro, *Creating Livable Streets: Street Design Guidelines for 2040*, November 1997.
- B. Zegeer, Charles V., Stewart, J. Richard and Huang, Herman, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines," University of North Carolina Highway Safety Research Center for Federal Highway Administration, July 2000.
- C. Public Rights-of-Way Access Advisory Committee (PROWAAC), *Building a True Community: Final Report of the Public Rights-of-Way Access Advisory Committee to the Access Board*, January 2001.
- D. Federal Highway Administration, *Manual on Uniform Traffic Control Devices (MUTCD)*, Millennium Edition, December 2000.
- E. Oregon Department of Transportation (ODOT), *Oregon Bicycle and Pedestrian Plan: An Element of the Oregon Transportation Plan*, June 1995.
- F. Washington State Department of Transportation (WSDOT), *Pedestrian Facilities Guidebook: Incorporating Pedestrians Into Washington's Transportation System*, prepared by OTAK for WSDOT, Puget Sound Regional Council, County Road Administration Board and Association of Washington Cities, September 1997.

Sidewalk Widths & Designs

Pedestrian Districts, as set forth in Policy 14.0 of the Washington County 2020 Transportation Plan are intended to have ‘wide sidewalks’. Sidewalk width should be based on expected usage. Some areas that are designated for enhanced pedestrian facilities, such as Town Centers or Station Community areas with Transit Oriented Development plan designations would be expected to have high levels of pedestrian use. Such areas would consequently warrant use of the widest sidewalks as shown on the street cross-section drawings that are included in this section. The attached street cross-sections are taken from the Technical Appendix of the 2020 Transportation Plan (Appendix B-8). Areas with ‘Special Area Street’ designations should use the Special Area Street Design Standards that have been incorporated into the Washington County Uniform Road Improvement Design Standards. Other areas, that are within Pedestrian Districts that are designated in the 2020 Transportation Plan, that would be expected to have lower levels of pedestrian activity, such as along a residential neighborhood route, do not require as wide a sidewalk. The following principles should be considered in determining sidewalk widths:

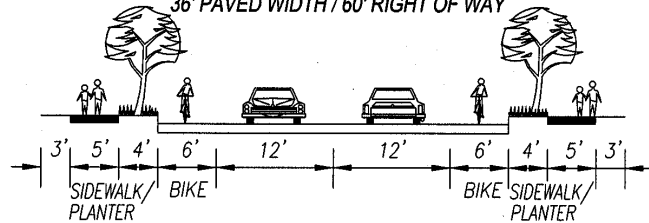
- Existing neighborhood design and the feasibility for design continuity.
- Americans with Disabilities Act (ADA) design standards.
- Protection and incorporation of large trees in project design.
- Level of near-term and long-term pedestrian usage in determination of sidewalk widths. This consideration should take into account existing and planned land uses and the likelihood of redevelopment. The greater the potential for heavy pedestrian use, the wider the sidewalk should be.
- The use of alternative pavement treatments or materials.
- On sidewalks that incorporate tree wells in the furnishings zone, rather than a continuously landscaped strip, the County encourages the use of the following type of grates. Use of standard grates eases maintenance and reduces costs.

ITEM	SPECIFICATIONS	APPROVED PRODUCTS
Tree Grate	Cast iron, ADA compliant	STA 4872 by FairWeather, Sunrise by Ironsmith or approved equal.

**TRANSPORTATION
SYSTEM PLAN:
COLLECTOR**

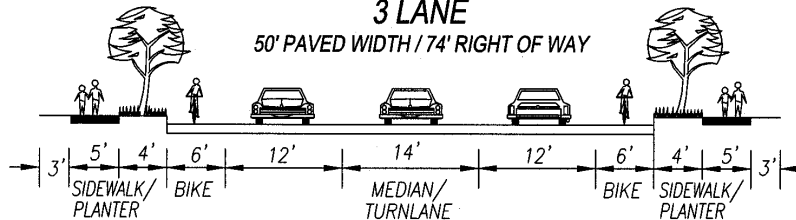
2 LANE

36' PAVED WIDTH / 60' RIGHT OF WAY



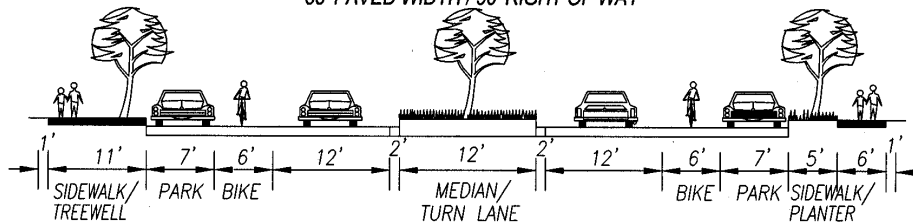
3 LANE

50' PAVED WIDTH / 74' RIGHT OF WAY



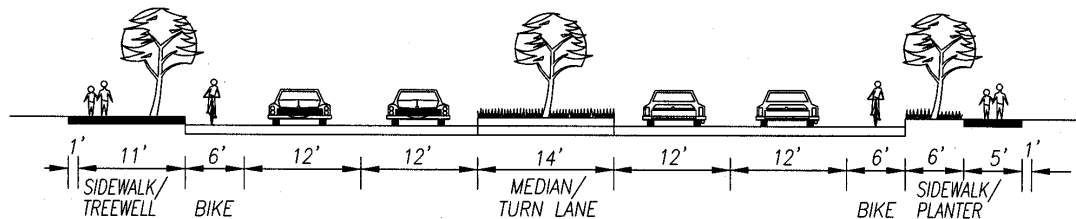
3 LANE - COMMUNITY STREET / BOULEVARD WITH PARKING

66' PAVED WIDTH / 90' RIGHT OF WAY



5 LANE - COMMUNITY STREET / BOULEVARD

74' PAVED WIDTH / 98' RIGHT OF WAY



DATE 07/18/02 . . \2312\TPU.DWG (L.YT. TPUB (COLLECTORS))

CRITERIA	5 LANES	3 LANES	2 LANES
VEHICLE LANE WIDTHS:	11-12 FT.	11-12 FT.	11-12 FT.
ON STREET PARKING:	NONE	7 FT. (OPTIONAL)	NONE
BICYCLE LANES:	5-6 FT.	5-6 FT.	5-6 FT.
SIDEWALKS:	5-14 FT.	5-14 FT.	5-12 FT.
LANDSCAPE STRIPS:	0-8 FT.	0-8 FT.	0-8 FT.
MEDIANS/TURN LANE WIDTHS:	12-16 FT.	12-16 FT.	NONE
NEIGHBORHOOD TRAFFIC MANAGEMENT:	NOT APPROPRIATE	NOT APPROPRIATE	NOT APPROPRIATE

NOTE: 20 FT. CLEAR BETWEEN PARKING AND RAISED MEDIAN CURB FOR EMERGENCY RESPONSE REQUIRED.



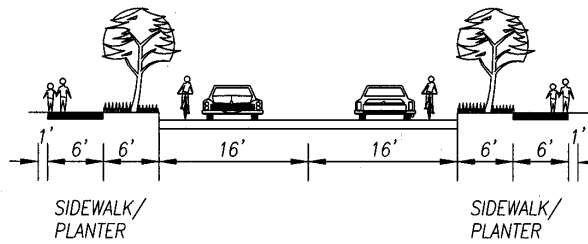
**WASHINGTON COUNTY
STREET CROSS SECTIONS**
WASHINGTON COUNTY, OREGON

**EXAMPLES OF TYPICAL COLLECTOR
ROADWAY SECTIONS**

TRANSPORTATION SYSTEM PLAN: NEIGHBORHOOD ROUTE

NEIGHBORHOOD ROUTE

36' PAVED WIDTH / 60' RW



CRITERIA

2 LANES

VEHICLE LANE WIDTHS:	16-18 FT.
ON STREET PARKING:	SHARED
BICYCLE LANES:	SHARED
SIDEWALKS:	5-12 FT.
LANDSCAPE STRIPS:	0-7 FT.
MEDIANS/TURN LANE WIDTHS:	NONE
NEIGHBORHOOD TRAFFIC MANAGEMENT:	CONDITIONALLY ALLOWED

DATE 07/18/02 . . . \2312\TPU.DWG (LYT. TPU6 (NEIGHBORHOOD STREET))

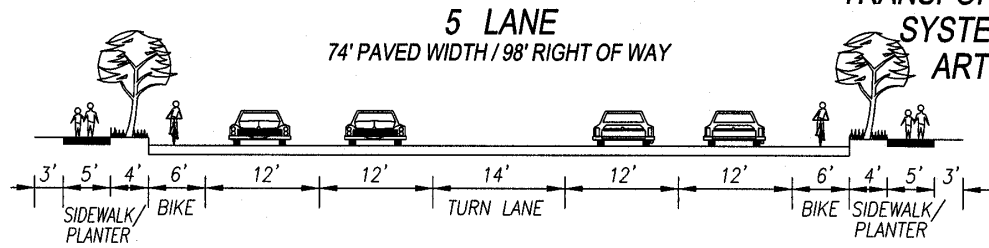


**WASHINGTON COUNTY
STREET CROSS SECTIONS**
WASHINGTON COUNTY, OREGON

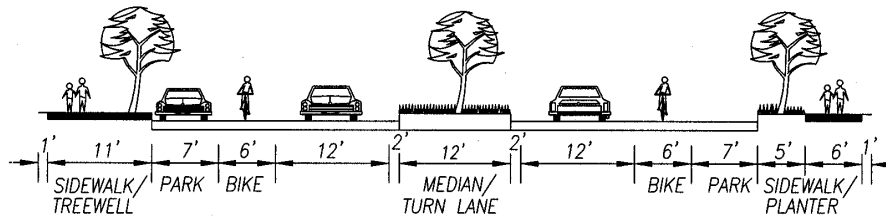
**EXAMPLE OF TYPICAL
NEIGHBORHOOD ROUTE ROADWAY SECTIONS**

DATE 07/18/02 . . . \2312\TPU.DWG (LYT. TPU7 (URBAN ARTERIALS))

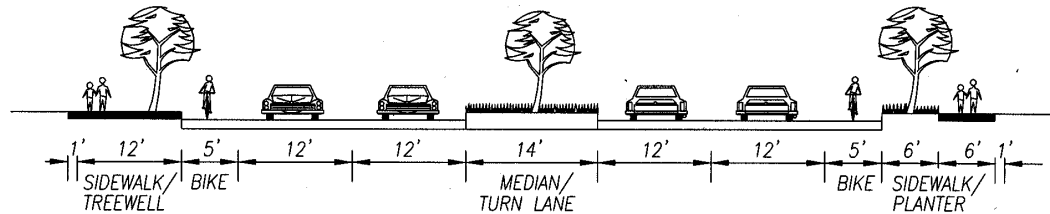
TRANSPORTATION SYSTEM PLAN: ARTERIAL



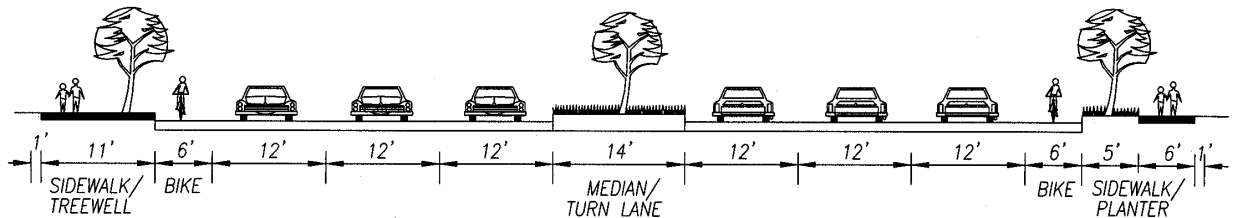
3 LANE - COMMUNITY STREET / BOULEVARD WITH PARKING
66' PAVED WIDTH / 90' RIGHT OF WAY



5 LANE - COMMUNITY STREET & BOULEVARD
72' PAVED WIDTH / 98' RIGHT OF WAY



7 LANE - COMMUNITY STREET / BOULEVARD
98' PAVED WIDTH / 122' RIGHT OF WAY



CRITERIA	7 LANES	5 LANES	3 LANES
VEHICLE LANE WIDTHS:	11-12 FT.	11-12 FT.	12 FT.
ON STREET PARKING:	NONE	NONE	7-8 FT. (OPTIONAL)
BICYCLE LANES:	5-6 FT.	5-6 FT.	5-6 FT.
SIDEWALKS:	5-12 FT.	5-14 FT.	5-12 FT.
LANDSCAPE STRIPS:	0-8 FT.	0-8 FT.	0-8 FT.
MEDIANS/TURN LANE WIDTHS:	12-16 FT.	12-16 FT.	12-16 FT.
NEIGHBORHOOD TRAFFIC MANAGEMENT:	NOT APPROPRIATE	NOT APPROPRIATE	NOT APPROPRIATE

NOTE: 20 FT. CLEAR BETWEEN PARKING AND RAISED MEDIAN CURB FOR EMERGENCY RESPONSE REQUIRED.



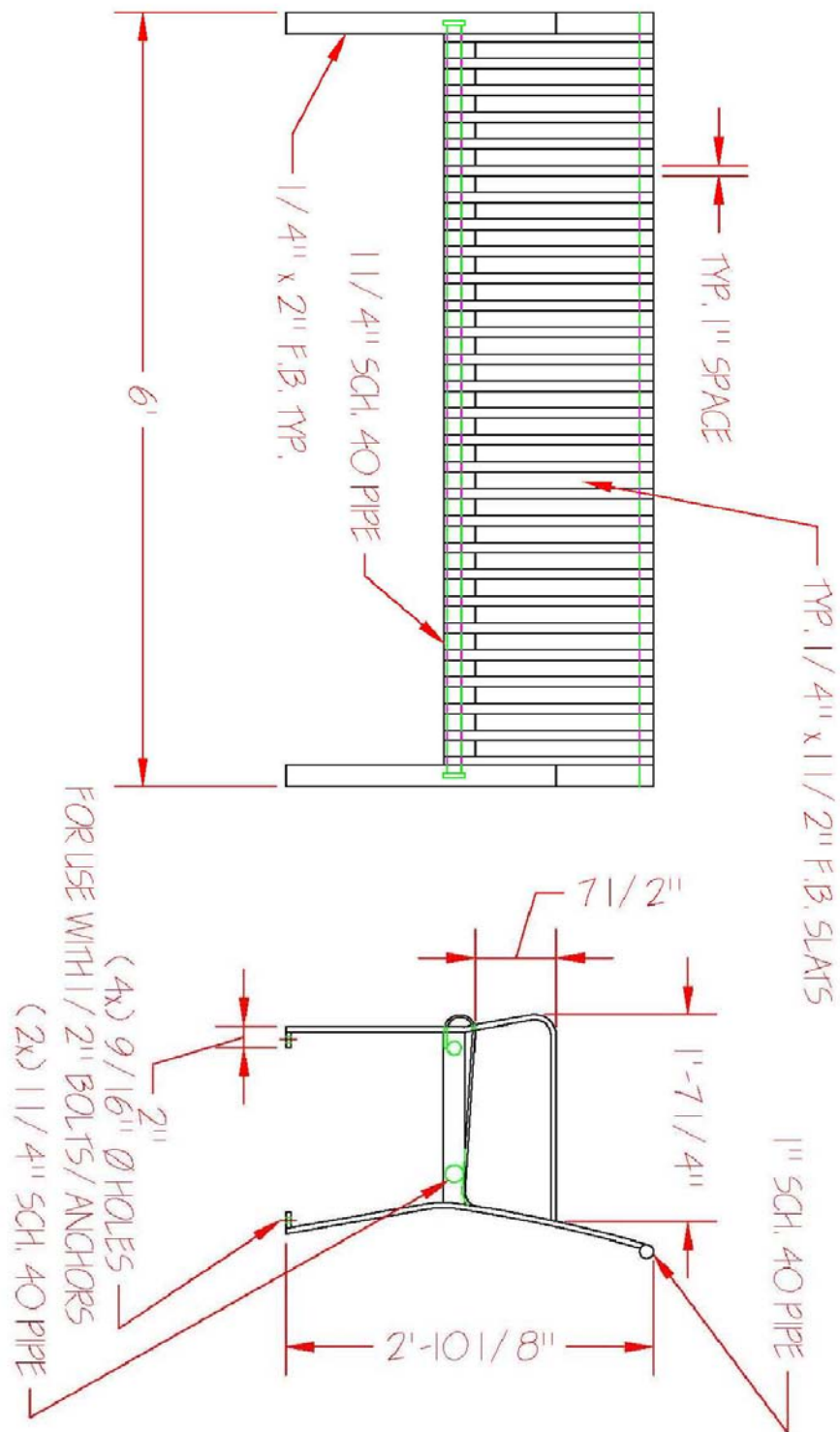
EXAMPLES OF TYPICAL ROADWAY SECTIONS - ARTERIAL

Name Botanical/Common	Height	Habit Spread	Shape	Compatability										List Source				Comments		
				Tree Wells	4' Planter	6' Planter	8' Planter	PGE / Powerline	Fruit / Hazard	Prune up 6'	Drought Tolerance	Native	Irrig. Required	City of Tualatin	City of Beaverton	City of Portland	Metro-Greenstreets			
Acer buergeranum/Trident Maple																	X	X		
Acer campestre/Maple, English Hedge					X	X												X		
Acer campstre/Hedge Maple									X									X		
Acer ginnala 'Flame'/Maple, Flame Amur					X	X												X		
Acer ginnala/Amur Maple									X								X	X		
Acer griseum/Maple, Paperbark	25	20			X	X			X									X		
Acer nigrum 'Greencolumn'/Maple, Greencolumn Black							X											X		
Acer peudoplatanus 'Atropurpureum'/Maple, Spaethii Sycamore								X										X		
Acer platanoides 'Cavalier'/Maple, Cavalier Norway							X											X		
Acer platanoides 'Cleveland'/Maple, Cleveland Norway	55	25	upright					X										X		
Acer platanoides 'Columnarbrood'/Maple, Parkway Norway							X											X		
Acer platanoides 'Columnar'/Columnar Norway Maple							X						X	X	X					
Acer platanoides 'Crimson King'/Maple, Crimson King Norway							X											X		
Acer platanoides 'Crimson Sentry'/Crimson Sentry Maple					X	X											X	X		
Acer platanoides 'Emerald Queen'/Maple, Emerald Queen Norway								X										X		
Acer platanoides 'Globosum'/Maple, Globe Norway					X	X												X		
Acer platanoides 'Schwedleri'/Maple, Schwedleri Norway								X										X		
Acer platanoides 'Superform'/Maple, Superform Norway								X										X		
Acer rubrum 'Armstrong'/Armstrong Maple																	X	X		
Acer rubrum 'Autumn Flame'/Maple, Autumn Flame Red							X											X		
Acer rubrum 'Bowhall'/Scanlon, Bowhall Maple							X					X		X	X					
Acer rubrum 'Doric'/Maple, Doric Red					X	X												X		
Acer rubrum 'Karpick'/Maple, Karpick Red	45	20	upright				X											X		
Acer rubrum 'October Glory'/Maple, October Glory Red								X										X		
Acer rubrum 'Red Sunset'/Maple, Red Sunset Red	45	35	oval				X							X	X					
Acer rubrum 'Scanlon'/Maple, Scanlon Red							X											X		
Acer rubrum x A. saccharinum 'Autumn Blaze'/Maple, Autumn Blaze								X										X		
Acer saccharum 'Arrowhead'/Maple, Arrowhead Sugar								X										X		
Acer saccharum 'Green Mountain'/Maple, Green Mountain Sugar							X											X		
Acer saccharum 'Legacy'/Maple, Legacy Sugar							X											X		
Acer tataricum/Maple, Tatarian					X	X												X		
Acer truncatum x A. platanoides 'Keithsform'/Maple, Norwegian Sunset					X													X		
Acer truncatum x A. platanoides 'Warrenred'/Maple, Pacific Sunset					X													X		
Acer x freemanii 'Armstrong'/Maple, Armstrong							X					X								
Acer x freemanii 'Celzam'/Maple, Celebration								X										X		
Aesculus x carnea 'Briotii'/Horsechestnut, Briotti Red							X											X		
Aesculus x carnea 'Ruby Red'							X											X		
Amelanchier canadensis 'Pyradidalis'/Serviceberry, Pyramidal Shadblow					X	X												X		
Amelanchier canadensis/Shadblow Service Berry									X									X		

Name Botanical/Common	Height	Habit Spread	Shape	Compatability										List Source				Comments		
				Tree Wells	4' Planter	6' Planter	8' Planter	PGE / Powerline	Fruit / Hazard	Prune up 6'	Drought Tolerance	Native	Irrig. Required	City of Tualatin	City of Beaverton	City of Portland	Metro-Greenstreets			
Amelanchier laevis x grandiflora 'Cumulus'/Serviceberry, Cumulus					X	X												X		
Amelanchier x grandiflora 'Robin Hill'/Serviceberry, Robin Hill Apple					X	X												X		
Amelanchier/Apple Service Berry									X									X		
Betula jacquemontii/Birch, Jacquemontii									X									X		
Betula nigra/Birch, River									X									X		
Carpinus betulus 'Fastigiata'/European Hornbeam	40	15	upright		X	X							?		X		X	X		
Celtis occidentalis/Hackberry, Common									X									X		
Cercis canadensis/Eastern Redbud						X			X									X		
Cercis canadensis/Redbud, Eastern					X													X		
Cercidiphyllum Japonicum/Katsura	60	40					X											X		
Cladrastis kentuckia/Yellow Wood							X											X		
Clerodendrum trichotomum/Glorybower						X			X									X		
Clerodendrum trichotomum/Glorybower, Harlequin					X													X		
Cleveland select' - pyrus calleryana/Flowering Pear									X									X		
Cornus florida/Dogwood, Eastern					X													X		
Cornus florida/Flowering Dogwood									X									X		
Cornus kousa chinesid/Dogwood, Kousa					X													X		
Cornus kousa/Japanese Dogwood									X									X		
Cornus mas/Dogwood/Cornelian Cherry					X													X		
Corylus/Filbert, Turkish									X									X		
Crataegus phaenopyrum/Washington Hawthorn									X									X		
Crataegus monogyna 'Stricta'/Hawthorn, Columnar					X	X												X		
Crataegus x lallevi/Hawthorn, Lavalley					X	X			X									X		
Crataegus phaenopyrum/Hawthorn, Washington	30	15			X	X												X		
Elaeagnus angustifolia/Olive, Russian					X	X												X		
Eucommia ulmoides/Rubber Tree, Hardy	50	45							X									X		
Fagus sylvatica 'Purpurea Tricolor'/Beech, Tricolor European							X											X		
Fraxinus amricana "Autumn Applause"/Ash, Autumn Applause White							X	X									X	X		
Fraxinus americana 'Autumn Purple'/Ash, Autumn Purple White								X										X		
Fraxinus excelsior 'Globosum'/Ash, Globe European					X	X												X		
Fraxinus excelsior globosum/Globe-Headed European Ash									X									X		
Fraxinus ornus/Ash, Flowering					X													X		
Fraxinus ornus/Flowering Ash						X			X									X		
Fraxinus oxycarpa aureaefolia 'Golden Desert'/Ash, Golden Desert					X	X												X		
Fraxinus osycarpa 'Flame'/Ash, Flame							X											X		
Fraxinus osycarpa 'Raywood'/Ash, Raywood							X											X		
Fraxinus exselsior 'Aureofolia'/Golden Desert Ash									X					X				X		
Fraxinus pennsylvanica 'Bergeson'/Ash, Bergeson Green									X									X		
Fraxinus pennsylvanica 'Patmore'/Ash, Patmore Green									X									X		
Fraxinus pennsylvanica 'Summit'/Ash, Summit Green	60	30							X									X		

Name Botanical/Common	Height	Habit Spread	Shape	Compatability											List Source				Comments		
				Tree Wells	4' Planter	6' Planter	8' Planter	PGE / Powerline	Fruit / Hazard	Prune up 6'	Drought Tolerance	Native	Irrig. Required	City of Tualatin	City of Beaverton	City of Portland	Metro-Greenstreets				
Ginkgo biloba 'Autumn Gold'/Ginkgo, Autumn Gold							X											X			
Ginkgo biloba 'Fairmont'/Ginkgo, Fairmont							X											X			
Ginkgo biloba 'Princeton Sentry'/Ginkgo, Princeton Sentry	75	20	columnar				X											X			
Ginkgo biloba 'Shangri-la'/Ginkgo, Shangri-la							X											X			
Ginkgo biloba/Ginkgo							X											X			
Ginkgobiloba 'Mayfield'/Ginkgo, Mayfield					X	X												X			
Gymnocladus dioicus/Coffeetree, Kentucky								X										X			
Honeylocust, Skyline/Gleditsia triacanthos 'Skyline'							X											X			
Koelreuteria paniculata 'Fastigiata'/Goldenrain, Columnar					X	X										X		X			
Koelreuteria paniculata/Golden Rain Tree					X	X			X									X			
Laburnum x waterii/Golden Chain Tree									X									X			
Liquidambar sturaciflua/Sweetgum								X										X			
Liquidambar styraciflua aurea 'Golden'/Sweetgum, Golden								X										X			
Liquidambar styraciflua 'Festival'/Sweetgum, Festival								X										X			
Liriodendron tulipifera 'Fastigiatum'/Tuliptree, Arnold							X	X										X			
Liriodendron tulipifera/Poplar, Yellow or Tuliptree							X											X			
Liriodendron tulipifera/Tuliptree or Yellow Poplar							X											X			
Magnolia grandiflora/Magnolia, Southern	70	40					X											X			needs room, fruit pods
Malus 'Profusion'/Crabapple, Profusion					X	X												X			
Malus 'Red Baron'/Crabapple, Red Baron					X	X												X			
Malus 'Royalty'/Crabapple, Royalty					X	X												X			
Malus 'Spring Snow'/Crabapple, Spring Snow					X	X												X			
Malus 'Sugar Tyme'/Crabapple, Sugar Tyme	18	15	upright		X	X												X			
Morus alba 'Kingan'/Mulberry, Kingan Fruitless								X										X			
Mt. Fuji' - prunus/Flowering Cherry									X									X			
Nyssa sylvatica/Tupelo, Black, Blackgum or Sourgum	90	35	pyramidal					X										X			
Ostrya virginiana/Hophornbeam, American								X										X			
Phellodendron amurense/Cork Tree, Amur									X									X			
Prunus cerasifera 'Krauter's Vesuvius'/Plum, Krauter's Vesuvius Flowering					X													X			
Prunus cerasifera 'Newport'/Plum, Newport Flowering					X													X			
Prunus cerasifera 'Thundercloud'/Plu, Thundercloud Flowering					X													X			
Prunus sargentii 'Columnaris'/Cherry, Columnar Sargent Flowering					X													X			
Prunus virginiana 'shubert'/Cherry, Shubert Select Flowering or Canada Red Chokecherry					X	X												X			
Prunus x yedoensis/Cherry, Yoshino Flowering					X	X												X			
Pyrus calleryana 'Aristocrat'/Pear, Aristocrat Flowering	35	25			X													X			
Pyrus calleryana 'Capital'/Pear, Capital Flowering					X													X			
Pyrus calleryana 'Glen's Form'/Chanticleer Pear													X	X							
Pyrus calleryana 'Chanticleer'/Pear, Autumn Blaze Flowering					X													X			

Name Botanical/Common	Height	Habit Spread	Shape	Compatability										List Source				Comments		
				Tree Wells	4' Planter	6' Planter	8' Planter	PGE / Powerline	Fruit / Hazard	Prune up 6'	Drought Tolerance	Native	Irrig. Required	City of Tualatin	City of Beaverton	City of Portland	Metro-Greenstreets			
Pyrus calleryana 'Chanticleer'/Pear, Chanticleer Flowering					X	X											X	X		
Pyrus calleryana 'Cleveland Select'/Pear, Cleveland Select Flowering					X	X												X		
Pyrus calleryana 'Princess'/Pear, Princess Flowering					X													X		
Pyrus calleryana 'Princess'/Pear, Redspire Flowering					X													X		
Pyrus calleryana 'Trinity'/Pear, Trinity Flowering					X	X												X		
Quercus acutissima/Oak, Sawtooth									X									X		
Quercus bicolor/Oak, Swamp White									X									X		
Quercus coccinea/Oak, Scarlet									X									X		
Quercus frainetto 'Schmidt'/Oak, Forest Green Hungarian or Italian									X									X		
Quercus imbricaria/Oak, Shingle									X									X		
Quercus macrocarpa/Oak, Burr									X									X		
Quercus palustris/Oak, Pin									X									X		
quercus robur /Oak, English									X									X		
Quercus robur 'Fastigiata'/Oak, Skyrocket English					X													X		
Quercus robur 'Michround'/Oak, Westminster Globe									X									X		
Quercus robur 'Pyramich'/Oak, Skymaster English						X												X		
Quercus rubra/Oak, Northern Red	75								X									X		
Quercus shumardii/Oak, Shumard									X									X		
Robinia pseudocacia 'Umbraculifera'/Locust, Globe							X											X		
Sophora japonica 'Regent'/Pagoda Tree, Regent Japanese							X											X		
Spring snow' or 'indian magic' - malus/Flowering Crabapple										X								X		
Stewartia pseudocamellia/Stewartia, Japanese							X											X		
Styrax japonica/Snowbell, Japanese					X	X			X									X		
Syringa reticulata 'Ivory Silk'/Japanese Tree Lilac	30	15	oval		X	X							X					X		
Tilia americana 'Redmond'/Linden, Redmond									X									X		
Tilia cordata 'DeGroot'/Linden, DeGroot Littleleaf							X											X		
Tilia cordata 'Glenleven'/Linden, Glenleven Littleleaf							X											X		
Tilia cordata 'Greenspire'/Linden, Redmond Crimean							X											X		
Tilia euchlora 'Redmond'/Linden, Redmond Crimean									X									X		
Tilia tomentosa 'Green Mountain'/Linden, Green Mountain Silver									X									X		
Tilia tomentosa 'Sterling'/Linden, Sterling Silver	45	30	round						X									X		
Ulmus 'Homestead'/Elm, Homestead									X									X		
Ulmus parvifolia/Elm, Chinese Elm or Lacebark									X									X		
Zelkova serrata 'Green Vase'/Zelkova, Green Vase									X									X		
Zelkova serrata 'Musashino'/Zelkova Musashino													X					X		
Zelkova serrata 'Village Green'/Zelkova, Village Green									X									X		



POLYESTER POWDER COATED.
BLACK COLOR.

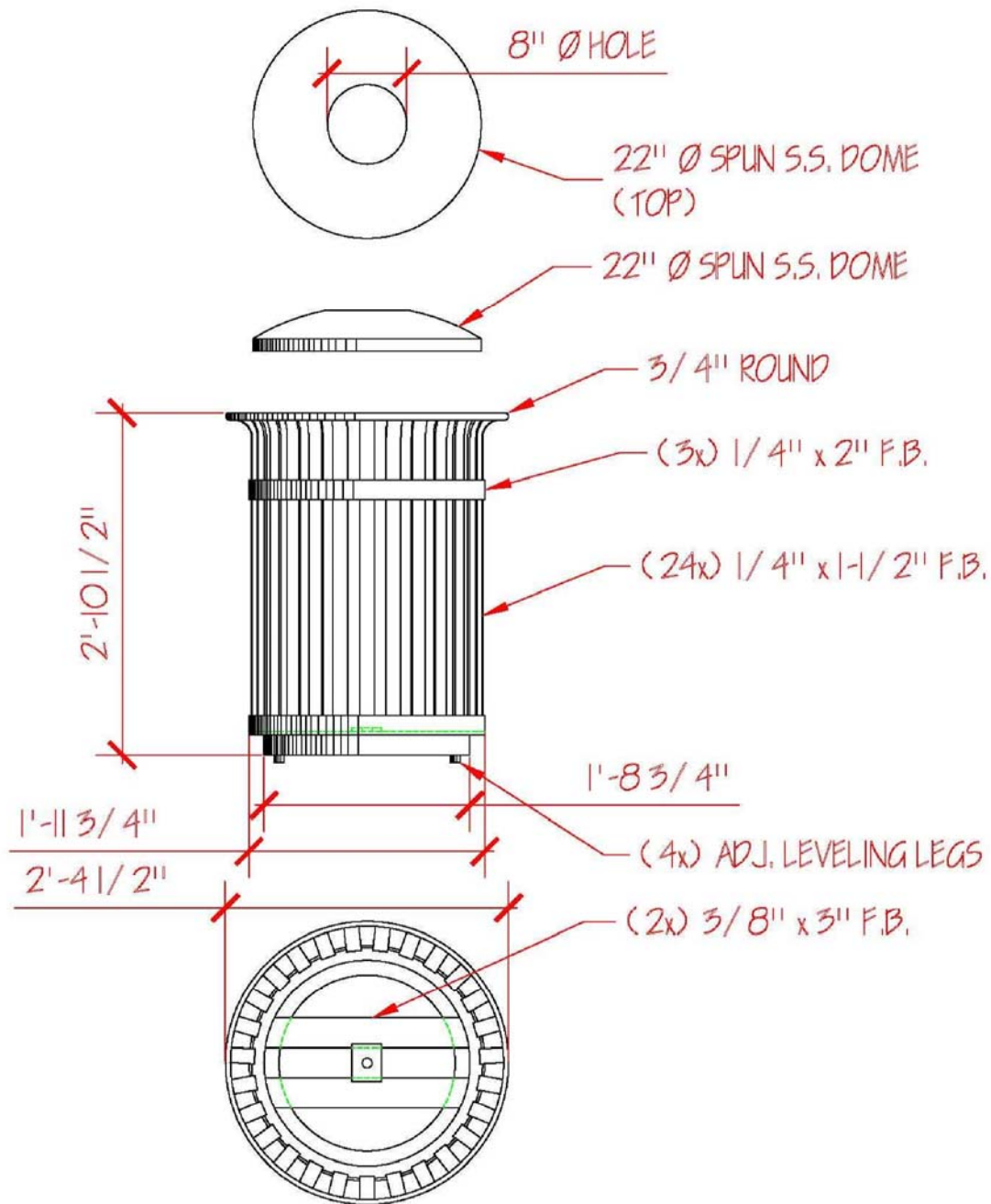
6' BENCH

PLOT STAMP: 03/22/05 10:59A KELLYE
 CAD: BENCH - 6 FOOT.DWG, TAB: 6 FT BENCH
 PATH: X:\DETAILS\STANDARD DETAILS\LANDSCAPE & WETLANDS\FURN\

BY	DATE
DRWN: KAE	3/05
DSGN: RBR	3/05
CHKD:	



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ENGINEERING



POLYESTER POWDER COATED.
BLACK COLOR.

TRASH RECEPTICAL

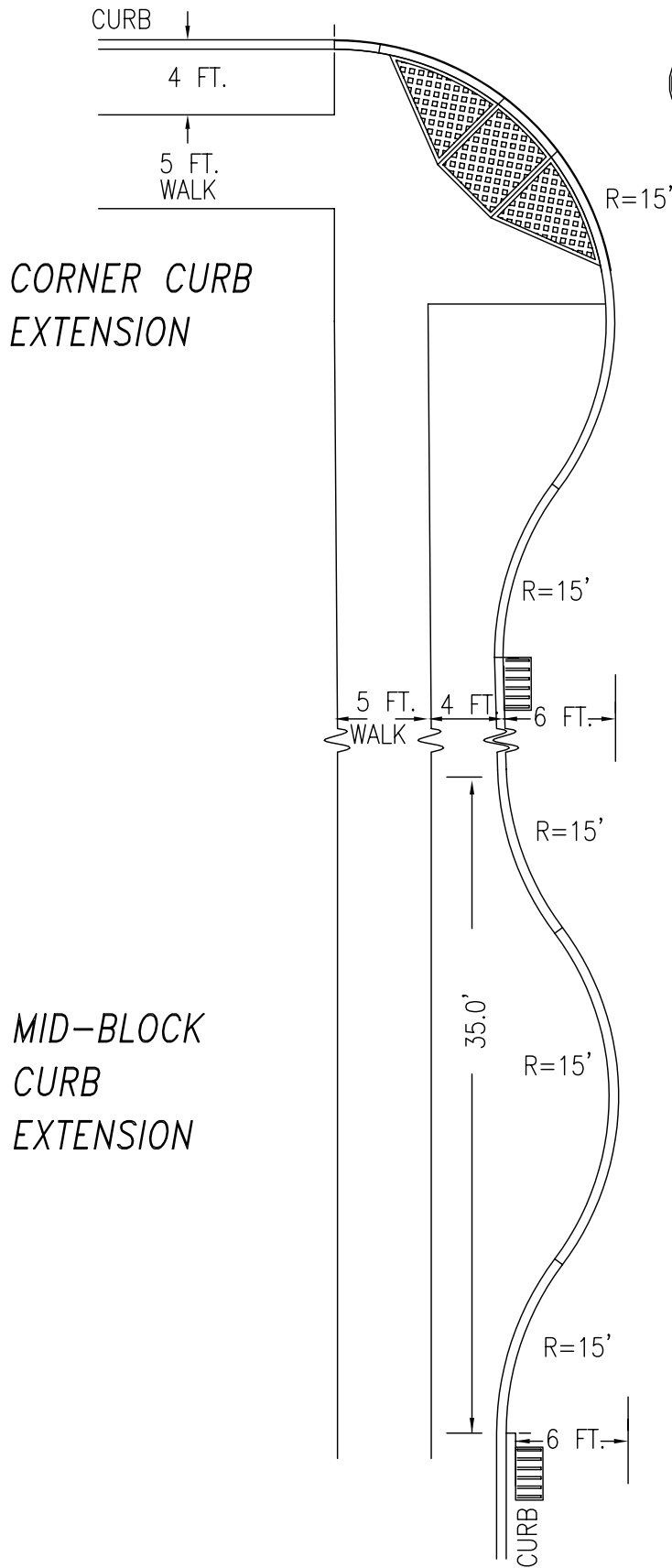
PLOT STAMP: 03/22/05 11:01A KELLYE
 CAD: TRASHRECEPTICAL.DWG, TAB: RECEPT
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DRWN: KAE	3/05
DSGN: RBR	3/05
CHKD: _____	_____



DEPARTMENT OF
LAND USE &
TRANSPORTATION
ENGINEERING

CURB EXTENSION



NOTES:

- 1) EXTENSIONS ARE INTENDED TO SIMULATE A PARKED VEHICLE, THEREFORE SHALL ONLY BE ALLOWED IN CONJUNCTION WITH ON-STREET PARKING.
- 2) EXTENSIONS SHALL BE LANDSCAPED WITH LOW GROWING VEGETATION SO AS TO NOT RESTRICT SIGHT DISTANCE.
- 3) INTERSECTION RADII SHALL BE CHECKED TO ASSURE SAFE PASSAGE OF THE DESIGN VEHICLE. IN ALL CASES, EMERGENCY VEHICLES SHALL BE ACCOMODATED.
- 4) DRAINAGE SHALL BE ADDRESSED WITH THE APPROPRIATE AGENCY
- 5) ON 28 FT. WIDE STREETS, CURB EXTENSIONS WILL NOT BE ALLOWED WITHIN 50 FT. OF THE INTERSECTION DUE TO THE TURNING RADIUS FOR EMERGENCY VEHICLES.
- 6) FOR THE SPECIAL AREA STREETS, CURB EXTENTION REQUIREMENTS ARE NOTED IN SECTION 215.7
- 7) SECTION 210.21 PROVIDES GUIDELINES FOR THE INSTALLATION OF MID-BLOCK CURB EXTENSIONS.



WASHINGTON COUNTY
DEPARTMENT OF LAND USE
AND TRANSPORTATION

CURB EXTENSION

REVISION	DATE

WASH. COUNTY NO.
M-409