CHAPTER FOUR

CHAPTER 4

TRANSPORTATION

GENERAL CONSIDERATIONS

4.1 General

The overall goal of this chapter is to encourage the uniform development of an integrated, fully accessible public transportation system that will facilitate present and future travel demand with minimal environmental impact to the community as a whole.

This chapter provides minimum development standards supplementing the applicable standards as set forth in Section 3.1.

STREETS

4.2 General

Street design must provide for the maximum loading conditions anticipated. The width and grade of the pavement must conform to specific standards set forth herein for safety and uniformity.

4.3 Design Standards

The design of streets and roads shall depend upon their type and usage. The design elements of city streets shall conform to City standards as set forth herein and current design practice as set forth in Section 3.1. Alternate sections may be used based on the criteria as outlined in Table 1, Street Design Standards.

The layout of streets shall provide for the continuation of existing principal streets in adjoining subdivisions or of their proper projection when adjoining property is not subdivided. Minor streets which serve primarily to provide access to abutting property shall be designed to discourage through traffic.

A. Alignment.

Alignment of major arterials, minor arterials and collectors shall conform as nearly as possible with that shown in the Comprehensive Transportation Plan, latest edition. Horizontal alignment shall meet all applicable design standards.

When the Transportation Plan doesn't include a proposed alignment, the alignment must be approved by the City Engineer.

B. Grade.

Street grade should conform closely to the natural contour of the land and meet geometric design standards. In some cases, a different grade may be required by the City Engineer. The minimum allowable grade shall be 0.5 percent. The maximum allowable grade shall be 15 percent, depending upon the street classification. No dead-end street or cul-de-sac shall have a grade greater than 8 percent in order to facilitate emergency vehicle access. **See Table 1 Street Design Standards for more detail.**

C. Width.

The pavement and right-of-way width depend upon the street classification. Table 1 Minimum Street Design Standards shows the minimum widths allowed.

Street widths shall be measured from face of curb to face of curb on streets with cement concrete curb and gutter.

D. The General Notes below shall be included on any plans dealing with street design in addition to all applicable requirements in Section 3.6.

GENERAL NOTES (STREET CONSTRUCTION)

1. All workmanship and materials shall be in accordance with City of Tumwater standards and the most current copy of the State of Washington Standard Specifications for Road, Bridge, and Municipal Construction.

2. The contractor shall be responsible for all traffic control in accordance with the M.U.T.C.D. Prior to disruption of any traffic, traffic control plans shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic control is in place.

3. All curb and gutter, street grades, sidewalk grades, and any other vertical and/or horizontal alignment shall be staked by an engineering or surveying firm capable of performing such work.

4. Where new asphalt joins existing, the existing asphalt shall be cut to a neat vertical edge and tacked with Asphalt Emulsion type CSS-1 in accordance with the standard specifications. The new asphalt shall be feathered back over existing to provide for a seal at the saw cut location and the joint sealed with grade AR-4000W

paving asphalt.

5. Compaction of subgrade, rock, and asphalt shall be in accordance with the standard specifications.

6. Form and subgrade inspection by the City is required before pouring concrete. Twenty-four hours notice is required for form inspection.

7. See these Guidelines for testing and sampling frequencies.

4.4 Functional Classification

City streets are divided into major (or principal) arterials, minor (or secondary) arterials, collector and local access streets in accordance with regional transportation needs and the functional use each serves. Function is the controlling element for classification and shall govern right-of-way, road width, and road geometrics. The following list is provided to assist the developer in determining the classification of a particular street. Streets not listed are classified as local access streets or in industrial zones as commercial collectors. Classification of proposed new streets will be done by the City Engineer.

A. Major (Principal) Arterials.
   1. Capitol Boulevard from Airdustrial Way to Carlyon
   2. Trosper Road from Littlerock Rd./2nd Ave. to Capitol Blvd.
   3. Airdustrial Way from Littlerock to Capitol Blvd.

B. Minor (Secondary) Arterials
   1. Old Highway 99 from South C/L to 73rd Avenue
   2. Capitol Boulevard from 73rd to Airdustrial Way
   3. Airdustrial Way (Future) from Capitol Blvd. to East C/L
   4. Henderson Blvd. from South C/L to Yelm Hwy
   5. Cleveland Avenue from North St./Custer Way to South St.
   6. Cleveland Avenue from South St. to Yelm Hwy (Hartman)
   7. Yelm Hwy from Cleveland Ave. to Henderson Blvd.
   8. Custer Way from 2nd Ave. to Cleveland Ave.
   9. North Street from Cleveland Ave. to East C/L (Pifer)
   10. Boston Street from Deschutes Way to Custer Way
   11. "E" Street from Deschutes Way to Capitol Blvd.
   12. Deschutes Way from "E" St. to North C/L
   13. Littlerock Road from South C/L to Trosper Rd.
   14. 2nd Avenue from Trosper Road to Desoto
   15. Trosper Road from West C/L to East C/L
   16. Trosper Road from Rural Road to 2nd Ave/Littlerock Road
   17. Black Lake Blvd from South C/L to North C/L

18. Crosby Blvd. from Barnes Blvd. to SR101 EB Ramps

C. Commercial/Industrial Collectors

1. RW Johnson Blvd. from Sapp to 25th Avenue
2. Mottman Road from C/L at RR Grade to C/L
3. Mottman Road from C/L to Crosby
4. 25th Ave. from Mottman to Crites*
5. Crites St. from 29th to 25th*
6. 29th Ave. from Crites to RW Johnson*
7. Ferguson Street from 34th to 29th*
8. 34th Ave. from Ferguson to RW Johnson*
9. Frontage Road (future) from Airdustrial to Israel*
10. Frontage Road (future) from Israel to Littlerock*
11. Center St. from 83rd to Airdustrial*

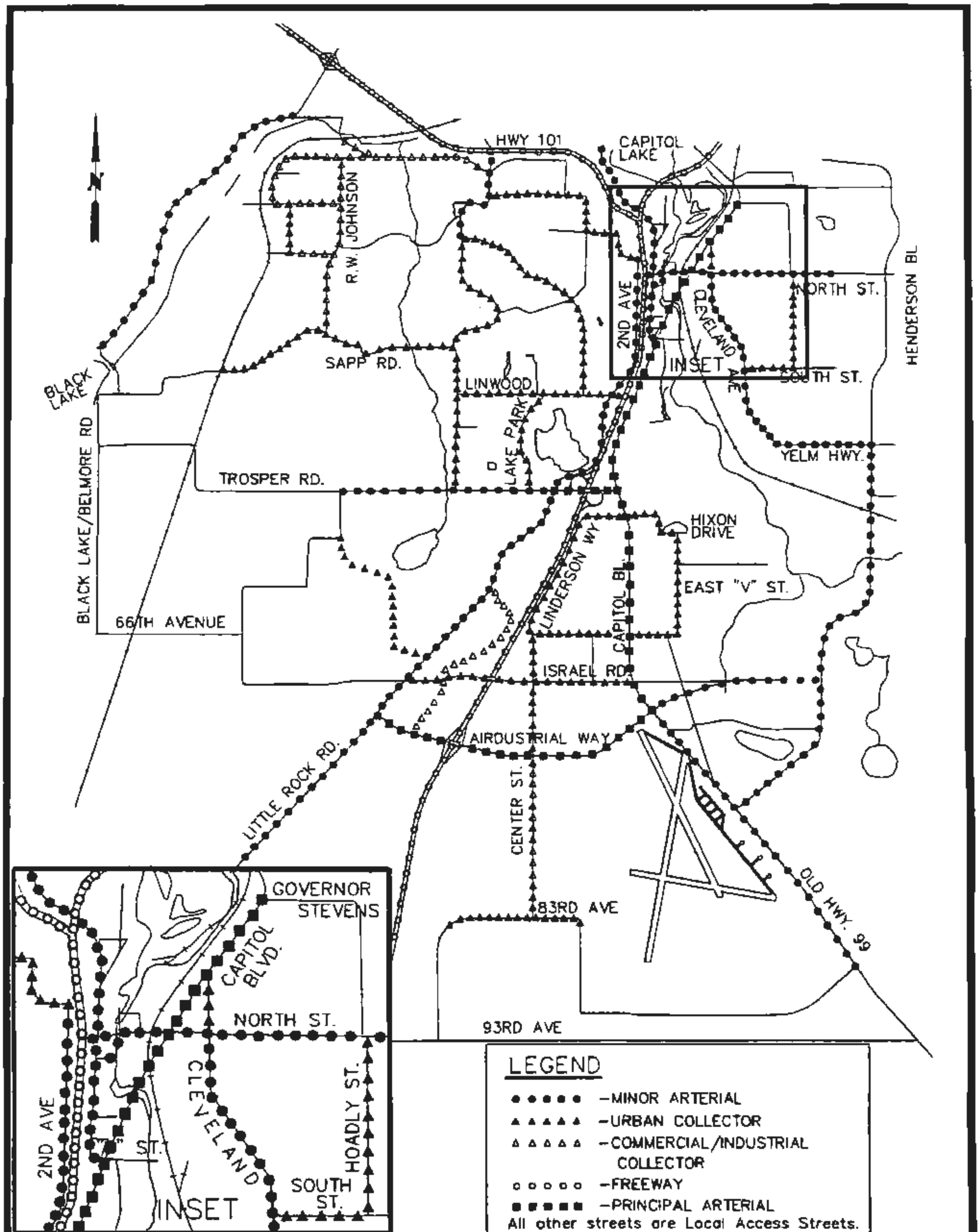
D. Urban Collectors

1. Israel Road from West C/L to Capitol Blvd.
2. Linderson Way from Airdustrial Way to Lee St.
3. Lee Street from Linderson to Capitol
4. Rural Road from Trosper road to Linwood
5. Linwood Avenue from 7th to Capitol
6. Sapp Road from RW Johnson to East C/L
7. 7th Avenue from Linwood to "I" Street
8. Barnes Blvd. from "I" Street to Crosby Blvd.
9. Linwood Avenue from Rural to 7th
10. Sapp Road from West C/L to RW Johnson
11. Crosby Blvd. from South End to Barnes
12. Irving Street from Crosby to 7th
13. 7th Avenue from Irving to Ferry
14. Ferry Street from 7th to 4th
15. 4th Avenue from Ferry to Desoto
16. Desoto Street from 4th to 2nd
17. South Street from Cleveland to Hoadly
18. Hoadly Street from South St. to North St.
19. Cleveland Ave. from Custer to Capitol
20. Miner Drive from Littlerock to Kirsop*
21. East Lake Street from Capitol to Boston*
22. Boston Street from Lee to Hazelhurst*
23. Hazelhurst St. from Boston to Elm*
24. Elm St. from Hazelhurst to East Dennis*
25. East Dennis from Elm to Capitol*
26. West Dennis from Linderson to Capitol*
27. 83rd Ave. from Kimmie to Armstrong*
28. Lakepark Drive from Trosper to Linwood*

E. Local Streets

All remaining City of Tumwater streets.

* *These streets are not included on the Federal Aid Functional Classification System.*



CITY OF TUMWATER

FUNCTIONAL CLASSIFICATION

DRAWN BY:	STD. PLAN NO.
BDH	ST-29
CHECKED BY: JRN	DATE: 4-24-95

Street Classification	Prescriptive[2,7] Structural Design	Right-of-way	Pavement Width	TWLTL or Median[8]	Parking Lane	Min/Max Grade	Curb	Sidewalks	Planter Strip	Intersection Curb Radius	Minimum Design Speed	Bike Lanes
Principal/Minor Arterial[1]	0.50’ HMA 0.20’ CSTC 1.50’ CSBC	Width of required improvement +2’ per side (60’ min.)	12’ per lane plus bike	12’	None	0.5%-8%	Concrete curb and gutter	Both side 6’ SEP	6’-10’ determined by City	35-50	40	(2) 7’ bike lane[4,7] where directed by the City
Collector	0.50’ HMA 0.20’ CSTC 1.50’ CSBC	Width of required improvement +2’ per side (60’ min.)	12’ per lane plus bike and/or parking	12’	Determined by City	0.5%-10%	Concrete curb and gutter	Both side 6’ SEP	6’-10’ determined by City	35[9]	30	(2) 6’ bike lanes where directed by the City
Local Residential[3]	0.33’ HMA 0.20’ CSTC 0.80’ CSBC	60 50(alternate)	32 (20)	N/A	Two	0.5%-15%	Concrete curb and gutter	Both side 6’ SEP	6’ or (variable)	25	20	(2) 6’ bike lanes where directed by the City
Local Residential Reduced[7]	0.33’ HMA 0.20’ CSTC 0.80’ CSBC	35-60	24-32	N/A	None to Two	0.5%-15%	Concrete curb and gutter	Both side 6’ SEP	6’ or (variable)	25	20	N/A
Private	0.20’ HMA 0.20’ CSTC 0.70’ CSBC	30’ easement	26	N/A	One	0.5%-15%	N/A	One side min.	6’ or (variable)	25	N/A	N/A
Private Alleys	0.20’ HMA 0.20’ CSTC 0.70’ CSBC	N/A	16	N/A	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A

City of Tumwater	Transportation & Engineering Department	Standard Plan	Updated 09-21-2023

1. Principal arterials shall include four vehicular lanes exclusive of turn lanes.
2. Prescriptive structural section shall be used absent a site specific AASHTO structural roadway design utilizing a field verified “R” value. A site specific AASHTO structural roadway design will be required where poor soil characteristics exist.
3. Roadways within developments estimate to create less than 500 ADT, with single access, no thru, and no potential for thru street will not be required to have sidewalk on one side.
4. 7’ bike lanes consist of 5’ of pavement plus a 2’ buffer stripe.
5. Bike lanes include gutter (City made reduce bike lane width to 5’ at its sole discretion).
6. For designated truck routes the section shall be 0.67’ HMA, 0.20’ of CSTC, and 1.50’ of CSBC. Truck routes include those shown in the City of Tumwater Transportation Master Plan or others not included in a plan, but determined by the City to function as a truck route.
7. At the discretion of the City, improvements and right-of-way widths may be reduced where there exists conditions of topography, access, location, shape, size, drainage or other physical features of the site or other adjacent development. The City may also consider use of this provision for narrow infill sites where it is unlikely redevelopment of other properties in the vicinity will occur. This provision should be considered the preferred alternative.
8. The City may the requirement for a TWLTL or median where deemed appropriate by the TED Director.
9. A larger radius may be required by the City at its discretion.

4.5 Naming

Streets and roads shall be named according to specific criteria. All streets lying west of Capitol Boulevard are designated Southwest (SW). Streets lying east of Capitol Boulevard are designated Southeast (SE). "Avenues" run east-west and are numbered with the exception of certain long-standing historical names. "Streets" run north-south and are named. "Drives" are irregular or diagonal streets over two grid blocks in length not conforming to the grid pattern. "Places" shall be a north-south street, parallel to but between streets. "Ways" shall be an east-west street parallel to but between avenues. "Courts" shall be a cul-de-sac which cannot be extended. Courts are to be named or numbered and carry the number of the preceding street or avenue. "Loops" shall be small loop-type streets to carry the name of the street from which they originate. "Lanes" shall be private streets.

An address number will be assigned to all new buildings at the time the building permit is issued. It is then the owner's responsibility to see that the house numbers are placed clearly and visibly on the structure at the main entrance to the residence or place of business and/or at the principal place of ingress.

New development projects must check with the Building Official regarding the naming of streets within proposed developments. This should be done at the time the preliminary plat is submitted and again upon approval of the final plat. The Building Official will insure that the name assigned to a new street is consistent with policies of the City and is not in conflict with existing street names within the county and other cities. The City has final authority for designation of street names.

4.6 Signing

The developer is responsible for providing all traffic control signs and street markings. Traffic control signing shall comply with the provisions as established by the U.S. Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD).

Street designation signs, including poles and hardware, will be furnished and installed by the developer according to City standards. All signage shall be shown on engineering site plans and designs shall be shown on detail sheets. Signage shall be installed prior to issuance of building permits. Street designation signs shall display street names, district destinations and grid numbers.

4.7 Right-of-Way

Right-of-way is determined by the functional classification of a street and the number of traffic lanes required. All streets should have sufficient right-of-way to accommodate all required traffic lanes, sidewalks, bicycle paths, and landscaping, plus two feet per side for utility pole placement etc. See Table 1, minimum street design standards, for specific widths.

Right-of-way requirements may be increased if transit lanes, bus loading zones, operational speed, schools or other factors are required as determined by the Director of Development Services.

Right-of-way shall be conveyed to the City on a recorded plat or by a right-of-way dedication deed.

4.8 Private Streets

See definition of private street in Section 3.4.

A. Private streets may be allowed under the following conditions:

1. Permanently established by tract or easement providing legal access to serve no more than four dwelling unit~~s~~ or businesses on four separate parcels, or unlimited dwelling units or businesses situated on one parcel and sufficient to accommodate required improvements, to include provisions for future use by adjacent property owners when applicable. The four parcel restriction does not apply to Port of Olympia Airdustrial Park private roads due to Federal Aviation Administration requirements. In addition, private streets may be allowed as part of an approved PUD, if conditions 2-5, below, are met.
2. Meet the minimum design standards for private streets in Table 1.
3. Accessible at all times for emergency and public service vehicle use.
4. Will not result in landlocking of present or future parcels nor obstruct public street circulation.
5. Covenants have been approved, recorded, and verified with the City which provide for maintenance of the private streets and associated parking areas by the owner or homeowners association or other legal entity.

B. Acceptance as Public Streets.

Acceptance of private streets as public streets will be considered only if the street(s) meet all applicable public street standards, including right-of-way widths. The developers engineer shall provide as built designs and testing to confirm proper construction standards.

4.9 Street Frontage Improvements

A. All commercial and residential (including multi-family) development, including alterations or improvements to existing structures, plats, and short plats shall install street frontage improvements at the time of construction as required by the Development Services Department. If improvements or alterations are made to property amounting to 25% or greater of the assessed valuation or current market value as shown by an appraisal approved by the City, within any twelve month period, frontage improvements are required. Such improvements may include curb and gutter; sidewalk; street storm drainage; street lighting system; traffic signal modification, relocation or installation; utility relocation; landscaping and irrigation, and street widening all per this Guide. Plans shall be prepared and signed by a licensed civil engineer registered in the State of Washington. Additions, alterations or repairs to single family dwellings shall be exempt from this requirement. Alterations, repairs or replacements of a residential structure due to fire, earthquake, storm damage or other natural disasters shall be exempt from these requirements.

B. All frontage improvements shall be made across full frontage of property from centerline to right-of-way line. This may include reconstruction of existing roadway in order to provide a uniform roadway section and meet current design standards.

C. Exceptions. For construction of a single family home or a duplex on an existing lot of record, the Development Services Director may under certain circumstances determine that the immediate construction of frontage improvements is not appropriate. Such circumstances include:

1. Frontage improvements on properties within 200 feet either side of subject property do not exist and are not anticipated in the next 6 years so that the immediately required frontage improvements would not connect with other frontages to provide continuous frontage improvements on the block face.

2. City scheduled utility or street improvements will necessitate the reconstruction of the developer required

frontage improvements.

3. Where, due to topographical conditions, the estimated cost of installing the required frontage improvements is greater than two times the estimated cost of installing the same improvements on a property with typical topographical conditions.

4. Existing right-of-way is not available to accommodate placement of the frontage improvements and the city doesn't desire to pursue acquisition at this time.

Upon a finding by the Development Services Director based on the above criteria that the immediate installation of frontage improvements is not appropriate, the Director may allow the developer, at the option of the developer, to pay a fee in lieu of actual installation of the otherwise required frontage improvements. The fee in lieu assessment shall be calculated by the developer's engineer and approved by the Public Works Director.

D. Frontage improvements on an unopened right-of-way or newly dedicated right-of-way for a project accessing the right-of-way shall include full half street frontage improvements plus one 12 foot traffic lane.

E. In such cases when deferral of street frontage improvements are granted, sufficient fiscal assurance must be submitted to insure completion of the street frontage improvements at the end of the deferral period.

4.10 Cul-de-sac

Streets designed to have one end permanently closed shall be no longer than 500 feet. At the closed end, there shall be a widened "bulb" having a minimum paved traveled radius as shown in the Minimum Street Design Standards Table. A "Y" or "T" which allows for comparable ease in turning for emergency vehicles may be allowed on private streets.

4.11 Temporary Dead Ends

Where a street is temporarily dead ended, turn-around provisions must be provided where the road serves more than one lot. The turn-around may be a hammerhead with a minimum distance on both sides at the centerline intersection of 60 feet to facilitate emergency vehicle turn-around.

4.12 Half Street

A half street is an otherwise acceptable roadway section modified to conform to limited right-of-way on the boundary of property subject to development. See definition in section 3.4.

A. A half street may be permitted subject to approval by the Development Services Director when:

1. There is reasonable assurance of obtaining the prescribed additional right-of-way from the adjoining property suitable for completion of a full-section roadway; and

2. Such alignment is consistent with or will establish a reasonable circulation pattern; and

3. The right-of-way width of the half street shall equal at least 30 feet; and

4. The traveled way shall be surfaced the same as the designated street classification to a width not less than 24 feet; and

5. The half street shall be graded consistent with locating centerline of the ultimate roadway section on the property line; and

6. Property line edge of street shall be finished with permanent-type curb and gutter to insure proper drainage, bank stability and traffic safety.

4.13 Medians

A median shall be in addition to, not part of, the specified roadway width except on a road classed as a boulevard. Medians shall be designed so as not to limit turning radius or sight distance at intersections. Landscaping and irrigation shall be installed when directed by the City Engineer.

4.14 Intersections

A. Traffic control will be as specified in the Manual on Uniform Traffic Control Devices (MUTCD) or as modified by the City Engineer as a result of appropriate traffic engineering studies.

B. Street intersections shall be laid out so as to intersect as nearly as possible at right angles. Deviations to this may be allowed at the discretion of the City Engineer. For safe design, the following types of intersection features should be avoided:

1. Intersections with more than four intersecting streets;

2. "Y" type intersections where streets meet at acute angles;

3. Intersections adjacent to bridges and other sight obstructions.

C. Spacing between adjacent intersecting streets, whether crossing or "T" should be as follows:

When highest classification involved is:	Minimum centerline offset should be:
Major Arterial	350 feet
Minor Arterial	300 feet
Commercial Collector	200 feet
Neighborhood Collector	200 feet
Local Access	150 feet

D. On sloping approaches at an intersection, landings shall be provided with grade not to exceed one foot difference in elevation for a distance of 30 feet approaching any arterial or 20 feet approaching a collector or local access street, measured from nearest right-of-way line (extended) of intersecting street.

E. Deviations to this section may be allowed at the direction of the City Engineer.

4.15 Driveways (Curb/Sidewalk cut)

A. General

1. Details of driveway approach sections are located at the end of this chapter.

2. All abandoned driveway approaches on the same frontage shall be removed and the curbing and sidewalk or shoulder and ditch section and landscaping strip shall be properly

restored.

3. All driveway approaches shall be constructed of Portland Concrete Cement and shall be subject to the same testing and inspection requirements as curb, gutter, and sidewalk construction.

4. Joint-use driveway approaches serving two adjacent parcels may be built upon formal written agreement by both property owners and approval of the City. The agreement shall be a recorded easement for both parcels of land specifying joint usage.

5. Grade breaks, including the tie to the roadway, shall be constructed as smooth vertical curves. The maximum change in driveway grade shall not exceed 8 percent within any 10 feet of distance on a crest and 12 percent within any 10 feet of distance in a sag vertical curve.

6. No commercial driveway approach shall be approved where backing onto the sidewalk or street will occur.

B. Arterial Streets

1. No driveway may access an arterial street within 75 feet (measured along the arterial) of any other such arterial street access on either side of the street; provided, that such access may be located directly opposite another access.

2. No driveway access shall be allowed to an arterial street within 150 feet of the nearest right-of-way line of an intersecting street.

3. For the purposes of this section within the limitations set forth above, access to arterial streets within the City shall be limited to one driveway for each tract of property separately owned. Properties contiguous to each other and owned by the same person are considered to be one tract.

4. Driveways giving direct access onto arterials may be denied if alternate access is available.

Deviations to the standards in Section B above may be granted at the discretion of the Director of Development Services based on site conditions.

C. Width

1. The maximum driveway width for two-way access drives onto an arterial or collector shall be 24 feet for residential, 30 feet for commercial uses, and 36 feet for industrial uses. Maximum driveway widths for one way access drives onto an arterial or collector shall be 20 feet for residential, 20 feet for commercial, and 25 feet for industrial uses. A road approach or wider driveway width may be approved by the Development Services Director where a substantial percentage of oversized vehicle traffic exists, where divisional islands are desired, or where multiple exit or entrance lanes are needed.

2. The maximum driveway width onto a local access street shall be 24 feet for residential uses and 26 feet for commercial uses. Industrial access onto local access streets is not allowed.

3. The maximum one way driveway width onto a local access street shall be 14 feet for residential and 22 feet for commercial driveways. Parking lot circulation and signing needs shall be met on site. The public right-of-way shall not be utilized as part of a one way parking lot flow.

4. Road approaches and/or ingress and egress tapers may be required in industrial and commercially zoned areas as directed by the City Engineer. Tapers shall be designed per Institute of Transportation Engineers publication "Transportation and Land Development" by V. G. Stover and F. Koepke.

4.16 Sight Obstruction

The following sight clearance requirements take into account the proportional relationship between speed and stopping distance.

The sight distance area is a clear-view triangle formed on all intersections by extending two lines of specified length (A) and (B) as shown below from the center of the intersecting streets along the centerlines of both streets and connecting those endpoints to form the hypotenuse of the triangle. See detail ST-33 at the end of this chapter. The area within the triangle shall be subject to said restrictions to maintain a clear view on the intersection approaches.

Sight Distance Triangle:

A. Stop or Yield Controlled Intersection

Sight Distance (Ft.)

Speed Limit	(A) Major Street	(B) Minor Street
25 mph	250	*
30 mph	300	*
35 mph	350	*
40 mph	400	*
45 mph	450	*
50 mph	500	*

*Sight distance measured from a point on the minor road 15 feet from the edge (extended) of the major road pavement and measured from a height of eye at 3.5 feet on the minor road to height of object at 4.25 feet on the major road.

B. The vertical clearance area within the sight distance triangle shall be free from obstructions to a motor vehicle operator's view between a height of 3 feet and 10 feet above the existing surface of the street.

C. Exclusions. Sight obstructions that may be excluded from these requirements include: fences in conformance with this chapter, utility poles, regulatory signs, trees trimmed from the base to a height of 10 feet above the street, places where the contour of the ground is such that there can be no cross visibility at the intersection, saplings or plant species of open growth habits and not in the form of a hedge which are so planted and trimmed as to leave at all seasons a clear and unobstructed cross view, buildings constructed in conformance with the provisions of appropriate zoning regulations and preexisting buildings.

4.17 Surfacing Requirements

See Table 1 for surfacing requirements for each application listed.

4.18 Temporary Street Patching

Temporary restoration of trenches shall be accomplished immediately by using 2" Class B Asphalt Concrete Pavement, or steel plates. No trench shall be left open overnight without a temporary patch.

All temporary patches shall be maintained by the contractor until such time as the permanent pavement patch is in place.

If the contractor fails to maintain a patch for whatever reason, the City will patch it at actual cost plus overhead and materials.

4.19 Trench Backfill And Restoration

Trench restoration shall be either by a patch or patch plus overlay as required by the City.

A. All trench and pavement cuts shall be made by saw cuts. The cuts shall be a minimum of 1 foot outside the trench width.

B. All trenching shall be backfilled as according to WSDOT/APWA and City of Tumwater Standards except as noted below.

   If the existing material is determined by the City to be suitable for backfill, the contractor may use the native material. All trench backfill materials shall be compacted to 95% density.

   Backfill compaction shall be performed in 6 inch lifts.

   Perpendicular trenchs shall be backfilled with controlled density fill as according to detail No. ST-13..

   Replacement of the asphalt concrete or Portland concrete cement shall be of existing depth plus 1 inch, or total thickness of 3 inches, whichever is greater.

C. Tack shall be applied to the existing pavement and edge of cut and shall be emulsified asphalt grade CSS-1 as specified in Section 9-02.1(6) of the WSDOT/APWA Standard Specifications. Tack coat shall be applied as specified in Section 5-04 of the WSDOT/APWA Standard Specifications.

D. Asphalt concrete Class B shall be placed on the prepared surface by an approved paving machine and shall be in accordance with the applicable requirements of Section 5-04 of the WSDOT/APWA Standard Specifications, except that longitudinal joints between successive layers of asphalt concrete shall be displaced laterally a minimum of 12 inches unless otherwise approved by the City Engineer. Fine and coarse aggregate shall be in accordance with Section 9-03.8 of the WSDOT/APWA Standard Specifications. Asphalt concrete over 2 inches thick shall be placed in equal lifts not to exceed 2 inches each.

   All street surfaces, walks or driveways within the street trenching areas affected by the trenching shall be feathered and shimmed to an extent that provides a smooth-riding connection and expeditious drainage flow for the newly paved surface. Shimming and feathering as required by the City Engineer shall be accomplished by raking out the oversized aggregates from the Class B mix as appropriate.

Surface smoothness shall be per Section 5-04.3(13) of the WSDOT/APWA Standard Specifications. The paving shall be corrected by removal and repaving of the trench only.

E. All joints shall be sealed using paving asphalt AR4000W.

F. When trenching within the roadway shoulder(s), the shoulder shall be restored to its original or better condition.

G. The final patch shall be completed as soon as possible and shall be completed within 30 days after first opening the trench. This time frame may be adjusted if delays are due to inclement paving weather, or other adverse conditions that may exist. However, delaying of final patch of overlay work is allowable only subject to the City Engineer's approval. The City Engineer may deem it necessary to complete the work within the 30 days time frame and not allow any time extension. If this occurs, the Contractor shall perform the necessary work as directed by the City Engineer.

H. When trenching within an existing roadway, no existing asphalt less than 4' wide shall be left in place. The Contractor will be required to remove existing asphalt and replace at the time of patching the trench.

4.20 Staking

All project staking shall be performed by qualified survey personnel working under the direct supervision of a Professional Land Surveyor or Professional Civil Engineer licensed by the State of Washington. In cases where the work includes the setting or perpetuation of street monumentation, the setting or replacement of land corners, or any other work requiring the services of a Professional Land Surveyor as defined by the laws of the State of Washington, said work shall be done under the direct supervision of a Professional Land Surveyor licensed in the State of Washington.

A preconstruction conference shall be held with the City prior to staking. All staking shall be inspected by the City prior to construction.

The minimum staking of streets shall be as directed by the City Engineer or as follows:

A. Stake centerline every 50 feet in tangent sections and 25 feet in curved sections plus grade breaks, PVCs, PVTs, high points and low points, with cut and/or fill to subgrade.

B. Stake top of ballast and top of crushed surfacing at centerline and edge of pavement at the above-described intervals.

C. Stake top back of curb at the above-described intervals with cut or fill to finished grade.

4.21 Testing

Testing shall be required at the developers or contractors expense. The testing shall be ordered by the developer or contractor and chosen testing lab shall be approved by the City construction inspector. Testing shall be done on all materials and construction as specified in the WSDOT/APWA Standard Specifications and with frequency as specified herein.

In addition, the City shall be notified before each phase of street construction commences (i.e. staking, grading, subgrade, ballast, base, top course, and surfacing) and must approve the preceding work prior to the next phase.

CITY OF TUMWATER

TESTING AND SAMPLING FREQUENCY GUIDE

ITEM	TYPE OF TESTS	MINIMUM #	FREQUENCY
GRAVEL BORROW	GRADING & SE	1 EACH	1 - 4000 TON
SAND DRAINAGE BLANKET	GRADING	1 EACH	1 - 4000 TON
CSTC	GRADING, SE & FRACTURE	1 EACH	1 - 2000 TON
CSBC	GRADING, SE & FRACTURE	1 EACH	1 - 2000 TON
BALLAST	GRADING, SE & DUST RATIO	1 EACH	1 - 2000 TON
BACKFILL/ SAND DRAINS	GRADING	1 EACH	1 - 2000 TON
GRAVEL BACKFILL FOR:			
Foundations	GRADING, SE & DUST RATIO	1 EACH	1 - 1000 TON
Walls	GRADING, SE & DUST RATIO	1 EACH	1 - 1000 TON
Pipe Bedding	GRADING, SE & DUST RATIO	1 EACH	1 - 1000 TON
Drains	GRADING	1 EACH	1 - 100 TON
CEMENT:	MIX DESIGN CERTIFICATION	1 EACH	1 - JOB
PCC STRUCTURES: (Sidewalk, curb and gutter, foundations)			
CYLINDERS(28 day)	COMPRESSIVE STRENGTH	2 EACH	1 - 100 CY
ASPHALT:	CERTIFICATION	1 EACH	1 - JOB
	MIX DESIGN	1 EACH	1 - JOB
	COMPACTION	2 EACH	5 - 200 TON
COMPACTION TESTING:			
Subgrade	COMPACTION	1 EACH**	1 - 150 LF
CSTC	COMPACTION	1 EACH**	1 - 150 LF
CSBC	COMPACTION	1 EACH**	1 - 150 LF
Ballast	COMPACTION	1 EACH**	1 - 150 LF
Trench Backfill	COMPACTION	1 EACH**	1 - 150 LF

SE = Sand Equivalency

* A control lot shall be a normal day's production. For minor quantities 200 tons or less per day, a minimum of two (2) gauge readings shall be taken.

** Minimum of two (2) tests for projects shorter than 150'.

SIDEWALKS, CURBS AND GUTTERS

4.22 General

All new building construction where the real premises involved abuts upon a street or public right-of-way, or when additions, alterations or repairs within any twelve month period exceed twenty-five percent of the value of existing building(s) or structure(s), shall make frontage improvements in conjunction with other improvement of the property. Such improvements may include sidewalks, curbs, gutters, street patch, street lights, storm drainage, street trees, and landscaping constructed along the street frontage or right-of-way in accordance with this development guide (see Table 1). Additions, alterations, or repairs to single family dwellings shall be exempt from this requirement. Alterations, repairs, or replacement of a residential structure due to fire, earthquake, storm damage, or other natural disaster shall be exempt from these requirements.

4.23 Design Standards

Plans for the construction of sidewalks, curbs and gutters are to be submitted as part of the street plans when applicable.

The City has set forth plan submittal minimum standards as outlined in Section 3.6 which must be met in the design and construction of sidewalks, curbs and gutters.

4.24 Sidewalks

Sidewalks shall be constructed of Commercial Concrete 4 inches thick. When the sidewalk, curb and gutter are contiguous, the width of the sidewalk shall be measured from back of curb and gutter to back of sidewalk.

A. Sidewalks, curbs and gutters shall be required on both sides of all streets except as follows: sidewalks will be required on one side within residential developments that generate less than 500 average daily vehicle trips; have a single access and have no thru or connecting streets or the possibility of any such streets.

B. The design and construction of all sidewalks, curbs, gutters and walkways shall meet the following minimum standards:

The width of sidewalks shall be as shown in the street design drawings. Those sidewalks designated in the comprehensive Parks Plan of the City as bike paths shall, in addition, meet the minimum width requirements established for said bike paths.

The City Engineer shall require that the design of all sidewalks provides for a gradual rather than an abrupt transition between sidewalks of different widths or alignments.

C. Form and subgrade inspection by the City, are required before sidewalk is poured.

D. Monolithic pour of curb, gutter and sidewalk will not be allowed.

E. For driveway requirements, see Section 4.15.

4.25 Curb and Gutter

Cement concrete curb and gutter shall be used for all street edges unless otherwise approved by the Director of Public Works. All curbs and gutters shall be constructed of Commercial Concrete as shown on Detail ST-11.

Extruded curb and gutter per WSDOT/APWA Standard Specifications is allowed.

Form and subgrade inspection by the City are required before curb and gutter are poured.

The face or top of all new curbs shall be embossed to denote the location of water and sewer services crossings. Water services shall be marked 1/4 inch into concrete with a "W" and side sewers shall be marked with an "S."

4.26 Handicap Ramps

Handicap ramps, in accordance with the standards of State law, must be constructed at all intersections, crosswalk locations and as designated by the City Engineer.

4.27 Staking

The minimum staking of curb, gutter and sidewalk shall be as directed by the City Engineer or as follows:

Stake top back of curb every 50 feet in tangent sections and 25 feet in curved sections plus grade breaks, PVCs, PVTs, high point and low points, with cut or fill to finished grade.

4.28 Testing

Testing shall be required at the developer's or contractor's expense on all materials and construction as specified in the WSDOT/APWA Standard Specifications.

At a minimum, one slump test and 2 test cylinders shall be taken once per day. All other testing frequencies shall be as specified in the Testing and Sampling Table in Section 4.21.

In addition, the City shall be notified before each phase of sidewalk, curb and gutter construction commences.

BIKEWAYS

4.29 This section is reserved for bikeway development standards following completion of a bicycle facilities plan.

ILLUMINATION

4.30 General

All new commercial or residential subdivisions, short plats or property development shall provide street lights in accordance with the standards for such improvements and they shall be owned and operated by the City.

4.31 Design Standards

Street lighting plans submitted by the applicant and approved by the City Engineer shall be required for all street light installations. Type of installation shall be as set forth in WSDOT/APWA Standard Specifications and as directed by the City except where noted herein.

All public street light designs shall be prepared by an engineering firm capable of performing such work. The engineer shall be licensed by the State of Washington.

Lights shall be located in accordance with the Illumination Standards Table. In addition, intersections shall be illuminated to 1.5 times the highest foot candle requirement of the streets surrounding the intersection. Exception: In residential and intermediate classes, local and collector streets intersecting other local and collector streets do not need 1.5 times the illumination provided a luminaire is placed at the intersection. Poles shall be opposite across the roadway or on one side of the roadway. Staggered spacing will not be allowed under most conditions.

For the purposes of this section, area classes are determined by zoning as referenced in the TMC.

Commercial

Commercial Development
Commercial High Intensity
Business Park

Industrial

Commercial Industrial
Airdustrial Park

Intermediate

Commercial Low Intensity
Commercial Medium Intensity
Commercial Services

Residential

Residential Sensitive Resource
Residential Low Density
Residential Medium Density
Residential High Density
Historic Commercial

As new zoning designations are created, they will be classified by the City Engineer. If road widths differ from those in the Illuminations Standards table, other spacings will be determined by the City Engineer using the following criteria:

AVERAGE MAINTAINED HORIZONTAL ILLUMINATION
(FOOT CANDLES)

AREA CLASS

Road Class	**Residential**	**Intermediate**	**Industrial**	**Commercial**
Local/Private	0.2	0.6	N/A	N/A
Collector	0.5	0.7.	0.8	0.9
Arterial	0.7	1.0	1.2	1.4

Uniformity ratio:
6:1 average: minimum for local
4:1 average: minimum for collector
3:1 average: minimum for arterial

Dirt Factor = 0.85, lamp lumen depreciation factor = 0.73
Weak Point Light = 0.2fc except residential local street

Average illumination at intersections 1.5 times the illumination required on the more highly illuminated street.

Line loss calculations shall show that no more than five percent voltage drop occurs in any circuit. Lamp Load factor shall equal 1.2. Pole foundations shall be per detail number ST-25 and ST-26. Poles shall be as follows:

	6' Single Arm	8' Single Arm	8' Twin Arm
GE	RRTA40SA6S8.01B	RRTA40SA8S8.01B	RRTA40SA8D10.02B
Hap Co	50700-001	50700-002	50701.013
Lexington	3608-45806T4	3608-45806T4	3608-60106T4
Valmont	21-40006CS0845	21-40008CS0845	22-40008CLS1060

Use type of pole already in use on a roadway.

ILLUMINATION STANDARDS

					MAXIMUM SPACING	
ROAD CLASS	AREA CLASS	STREET WIDTH	LUMIN HPS	MOUNTING HEIGHT	ONE SIDE	BOTH SIDES OPPOSITE
LOCAL	RES	36	100	30	170	--
	INT	36	200	30	170	--
COLLECTOR	RES	28	250	35	170	--
	RES	40	250	35	170	--
	INT	40	250	35	150	--
	IND	40	250	35	150	--
	COM	40	250	35	150	--
ARTERIAL	RES	58	310	40	170	240
	RES	70	310	40	170	240
	INT	58	310	40	150	240
	INT	70	310	40	150	240
	IND	58	310	40	150	220
	IND	70	310	40	150	240
	COM	58	310	40	130	220
	COM	70	310	40	130	225

*All luminairies to be flat lens, medium cut off, IES Type III distribution, General Electric Power Door or city approved equal.
100 watt catalog number GE M2AC10S3A1GMC31.
200 watt catalog number GE M4AC20S3A1GMC31.
400 watt catalog number GE M4AC40S3A1GMC31.

All street light electrical installations including wiring conduit, and power connections shall be located underground.

The following General Notes need to be included on any plans dealing with street design in addition to all applicable requirements as set forth in section 3.6.

GENERAL NOTES (Street Light Construction)

1. All workmanship, materials and testing shall be in accordance with the most current Washington State Department of Transportation/American Public Work Association Standard Specifications for Road, Bridge, and Municipal Construction, National Electrical Code and City of Tumwater Development Guide Manual unless otherwise specified below. In cases of conflict, the most stringent guideline shall apply. When the most stringent guideline is not clear, the City Engineer will make the determination. The electrical contractor shall

be familiar with all above-stated publications and guidelines as they will be strictly enforced by the City.

2. All safety standards and requirements shall be complied with as set forth by the State of Washington, Department of Labor and Industries.

3. The contractor shall be responsible for all traffic control in accordance with the Manual on Uniform Traffic Control Devices. Prior to disruption of any traffic, traffic control plans shall be prepared and submitted to the City for approval. (See WSDOT Standard Plans K2-K21.) No work shall commence until all approved traffic control is in place.

4. A pre-construction meeting shall be held with the City of Tumwater prior to the start of construction. Contact the Development Services Department to schedule a meeting.

5. All approvals and permits required by the City of Tumwater shall be obtained by the contractor prior to the start of construction.

6. It shall be the responsibility of the contractor to have a copy of an approved set of plans on the construction site at all times.

7. All project staking shall be performed by qualified survey personnel working under the direct supervision of a Professional Land Surveyor or Professional Civil Engineer licensed by the State of Washington. In cases where the work includes the setting or perpetuation of street monumentation, the setting or replacement of land corners, or any other work requiring the services of a Professional Land Surveyor as defined by the laws of the State of Washington, said work shall be done under the direct supervision of a Professional Land Surveyor licensed in the State of Washington.

8. Temporary erosion control/water pollution measures shall be required in accordance with section 1-07.15 of the WSDOT/APWA Standard Specifications and the Drainage Design and Erosion Control Manual for Thurston Region Washington. At no time will silts and debris be allowed to drain into an existing or newly installed facility.

9. If construction is to take place in the County right-of-way, the contractor shall notify the County and obtain all the required approvals and permits.

10. The contractor shall be fully responsible for the location and protection of all existing utilities. The contractor shall verify all utility locations prior to construction by calling the Underground Locate Line at 1-800-424-5555 a minimum of 48 hours prior to any excavation. The contractor will also be responsible for maintaining all locate marks once the utilities have been

located.

11. Electrical permits and inspections are required for all street lighting installations within the City of Tumwater. The contractor is responsible for obtaining said permits prior to any type of actual construction. These permits are available from the Washington State Department of Labor and Industries Electrical Safety Division.

12. Prior to installation of any materials, the electrical contractor shall submit for approval by the City two copies of material catalog cuts, specifications, shop drawings and/or wiring diagrams. Any materials purchased or labor performed prior to such approval shall be at the contractor's risk. Mounting heights, arm length, power source, luminaire type and bolt patterns shall follow City of Tumwater Development Guide Manual Section 4.31. Modifications of any portion of an existing lighting system will not be allowed without prior approval by the City.

13. A rated Service Disconnect shall be provided for every branch circuit. Light branch circuit breakers shall be 40 amp minimum. The location and installation of the disconnect shall conform to the National Electric Code (NEC) and City of Tumwater Standards. The Service Disconnect shall be of a type equal to a "MYERS" MEUGL-M100C-UM or a "UNICORN" CPIIIB-0111A Service, 120/240 VAC, CALTRANS TYPE 3B or City approved equal, with two lighting relays, one three position test switch (Auto/Off/Manual) and one photocell. The photocell shall face north unless otherwise directed by the City. (See Guideline Drawing ST-23.)

14. Service Entrance Conductors shall be a minimum size of #2 copper. All lighting wire shall be stranded copper with a minimum size of #8 with insulation suitable for wet locations. Phasing Tape will not be allowed. All wire shall be installed in schedule 40 PVC conduit with a minimum diameter of 1-1/4 inches. All conduit shall be installed in the "Utility Ditch" or as otherwise directed by the City. A bushing or bell end shall be used at the end of every conduit. All splices shall be in the nearest junction box. Wire nuts will not be allowed. All splices will be made with Type C copper fittings, centered and encased in a 3-M Scotchcast epoxy kit, rated at 600 Volts, type 82-A1, 82-B1 or City approved equal. If more than one circuit passes through a Junction Box each is to have a PCV sleeve clearly identifying the circuit. (WSDOT Standard Specification 8-20.3). A 500 volt megger test will be performed by the City on each circuit between conductor and ground prior to acceptance of the lighting system. The insulation resistance shall not be less than 6 megaohms to ground 2,500 feet and over nor less than 8 megaohms under 2,500 feet. A functional test will be performed by the City, in which it is demonstrated that each and every part of the system functions as specified or intended herein. (WSDOT Standard Specifications 8-20.3(11).

15. Each luminaire pole shall have an in-line, fused, water-tight electrical disconnect located at the base of the pole. Access to these fused disconnects shall be through the hand-hole on the pole. The hand-hole shall be facing away from on-coming traffic. Load side of in-line fuse to luminaire head shall be cable and pole bracket wire, 2 conductor, 19 strand copper #10 and shall be supported at the end of the luminaire arm by an approved means. Fuse size, disconnect installation and grounding in pole shall conform to WSDOT Standards.

16. City-approved pull boxes or junction boxes shall be installed per WSDOT Standard Plan J-11a in all street lighting installations. Junction boxes shall be incorporated into the back edge of sidewalk or as directed by City. Where no sidewalks exists, junction boxes shall have a concrete pad per Tumwater Drawing ST-22. No conduit run shall be more than 200 feet between junction boxes. A junction box shall be located within 10 feet of each luminaire pole and at every road crossing. No conduit shall be installed in the roadway except at designated road crossings. Conduit entering the junction box shall be perpendicular to the sides of the box and a minimum of 6 but no more than 8 inches below the lid. Boxes shall be clearly and indelibly marked as lighting boxes by the legend "L.T." or "LIGHTING". All J-Boxes shall be supported by a minimum 6 inch crushed gravel pad. A 3/8 inch expansion joint shall be installed between concrete sidewalk and junction box.

17. All lighting poles shall be as specified in section 4.31 of the Development Guide Manual. In existing developed areas, the City may require the use of other poles to establish uniformity within the developed area. After installation and before acceptance by the City, all poles shall be free of dents and marks. Sonotube shall be removed to below ground level. Pole bases shall be grouted and all luminaire heads shall be plumb and level.

18. Cement concrete bases shall follow City of Tumwater Development Guide Manual Drawing ST-25 Luminaire Foundation detail. Conduit shall extend between 3 and 6 inches above the concrete base.

19. Any modification to approved lighting plans shall be reviewed and approved by the City prior to installation. Any approved modifications shall be shown on a mylar asbuilt supplied to the City after the lighting installation is completed and before final acceptance. It shall be the responsibility of the electrical contractor to ensure these asbuilts are provided to the City.

4.32 Staking

All project staking shall be performed by qualified survey personnel working under the direct supervision of a Professional Land Surveyor or Professional Civil Engineer licensed by the State of Washington. In cases where the work includes the setting or perpetuation of street monumentation, the setting or replacement of land corners, or any other work requiring the services of a Professional Land Surveyor as defined by the laws of the State of Washington, said work shall be done under the direct supervision of a Professional Land Surveyor licensed in the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of luminaires shall be as follows:

A. Location and elevation to the center of every pole base:

B. Location and elevation of each service disconnect.

4.33 Testing

All illumination systems shall be subject to an electrical inspection which shall include megger testing and functional test. Lamp, photocell and fixture shall be under warranty for a period of two years.

SIGNALS

4.34 General

Signals shall be installed per the requirements set forth herein. This work shall consist of furnishing and installing a complete and functional traffic control system of controllers, signals, 1 "OPTICOM" pre-emption system and other appurtenances as required by the City.

4.35 Design Standards

Signal systems shall be designed in accordance with the specifications as set forth in the WSDOT Design Manual and the WSDOT/APWA Standard Specifications unless otherwise authorized by the City.

All public signal designs shall be prepared by an engineering firm capable of preforming such work. The engineer shall be licensed by the State of Washington. All applicable requirements set forth in Section 3.6 shall be included.

4.36 Induction Loops

Induction loops shall be constructed per WSDOT/APWA Standard Specification 8-20.3(14)C and the following:

A. Loops shall not be cut into final lift of new asphalt.

B. Loops shall be preformed in crushed surfacing top course (CSTC) before paving or shall be cut in existing asphalt or leveling course to subbase before intersection is overlaid.

4.37 Staking

The minimum staking of signals shall be as follows:

A. Location, with cut or fill to center of all pole bases.
B. Location of junction boxes.
C. Location of all corners of controller base.
D. Location of service disconnect.
E. Staking of pole bases to show orientation of pole/mast arm to the roadway.

4.38 Testing

All signals shall be subject to all necessary electrical inspections as well as requirements as set forth in the WSDOT Design manual and the WSDOT/APWA Standard Specifications.

Controller and cabinet testing will be required. Arrangements are to be made with equipment delivered to WSDOT District 3 laboratory for testing. All specifications and material samples shall be submitted to the City for review and approval prior to installation. All costs for this testing will be the responsibility of the Developer.

4.39 Check-Out Procedure

The contractor shall call for an intersection check-out after completing the controller cabinet installation along with all other signal equipment complete with wiring connections. All parts and workmanship shall be warranted for one year from date of acceptance.

New signals shall operate without any type of failure for a period of 30 days. The contractor shall have a man available to respond to system failure within 24 hours during the 30-day "check-out" period.

A signal system shall not be approved or accepted by the City until the signal has performed correctly to the City's satisfaction for a 30-day "check-out" period as outlined below.

Failure of any control equipment or hardware within the "check-out" period shall restart the 30-day "check-out" period.

ROADSIDE FEATURES

4.40 General

Miscellaneous features included herein shall be developed and constructed to encourage the uniform development and use of roadside features wherever possible.

4.41 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington.

4.42 Testing

Testing shall be required at the developer's or contractor's expense on all materials and construction as specified in the WSDOT/APWA Standard Specifications and with a frequency as specified in the WSDOT Construction Manual.

4.43 Survey Monuments

A. All existing survey control monuments which are disturbed, lost, or destroyed during surveying or building shall be replaced with the proper monument as outlined in B or C below by a land surveyor registered in the State of Washington at the expense of the responsible builder or developer.

B. Street type: Major Arterial; Minor Arterial; Bus Routes and Truck Routes. A pre-cast concrete monument with cast iron monument case and cover installed per City of Tumwater standards is required.

If the monument case and cover are placed in cement concrete pavement, the pre-cast base will not be necessary.

C. Street type: Commercial Collector; Neighborhood Collector; and Local.

A cast-in-place concrete surface monument with sufficient ferrous metal embedded to allow for detection by a magnetic detection device per City of Tumwater standards is required. Cap shall be "Berntsen RB Series" or brass plug marker.

D. Monument Locations

Appropriate monuments shall be placed:

1. At all street intersections;

2. At the Point of Curvature (PC) and Point of Tangency (PT) of all horizontal curves;

3. At Point Intersection (PI) of all horizontal curves of streets where the PI lies within the limits of the travelled roadway;

4. At all corners, control points and angle points around the perimeter of subdivisions as determined by the City;

5. At all section corners, quarter corners, and sixteenth corners that fall within the right-of-way.

E. The monument case shall be installed after the final course of surfacing has been placed.

4.44 Bus Shelter and Amenities

A. Different population densities dictate the number and placement of Intercity bus stops. The City and Intercity Transit will use the following general guidelines to determine frequency and spacing of stops on any given Intercity Transit route.

1. Commercial and Industrial Zones and environs bus stops can be placed approximately every 600 feet (8 to 10 per mile or 1 every 2 to 3 blocks.)

2. Fully developed areas with mixed apartments, single-family housing or no open space other than parks and schools can be placed no more frequently than every 800 feet (6 to 7 per mile or every 3 to 4 blocks.)

3. Suburban areas with primarily single-family housing with pockets of open space and undeveloped land can be placed every 1,250 feet (4 per mile), as needed in open areas.

   In order to evaluate a new route and build ridership placement of bus zones may initially depart from the above guidelines.

4. New service will not be initiated prior to the establishment of designated bus stops.

5. Bus stops can be initially located on an average of 4 to 6 stops per route mile along local residential collection/distribution

segments of a new route.

6. Additional stops may be added if warranted, but shall not exceed the basic stop spacing guidelines of 8 to 10 stops per mile and no 2 stops within 600 feet of one another.

7. For further information, refer to the Intercity Transit Facilities Design Manual.

B. The City, and Tumwater School District, and Olympia School District will use the following criteria in placement and design of school bus stops:

1. A school bus stop shall be required for each new residential subdivision or apartment complex where school children are to be boarding or deboarding unless it is determined by the appropriate School District that a new bus stop is not required because adjacent facilities already exist for the site.

2. Placement shall be determined by the appropriate School District and the City.

3. Location of school bus stops shall be designed with safety as a paramount concern. Major arterials with high traffic counts should be avoided where possible and only used when bus pull outs are available and significant protection provided for children.

4. School bus stops shall be designed to compliment the residential environment and provide convenient location and access for neighborhood children including sidewalk access.

5. Every effort shall be made to make school bus stops, sidewalk and or crosswalk access to school bus stops a safe and friendly pedestrian environment.

6. Intercity Transit and the appropriate School District should make every effort to coordinate the location of bus stops.

C. The physical location of any bus stop shall be primarily determined by the following considerations: maximizing safety, operational efficiency, and minimizing impacts to adjacent property. Bus pullouts may be required on all arterial and commercial collector roads for safe bus berthing and to minimize impacts on traffic flow of buses stopping. Additionally, bus pull outs may be required on neighborhood collectors or local access roads if it is determined by the City, Intercity transit, and the appropriate School District.

D. All Intercity Transit and School District bus stops shall be identified in some fashion. This may include pavement marking and bus stop signs.

E. Passenger shelters are required at all bus pullouts, transfer centers, and bus stops. The following requirements apply to bus shelters:

1. Passenger shelters for Intercity Transit sites and School District sites shall be designed to the standards of Intercity Transit, e.g. transparent for passenger visibility and safety, provide protection from the elements, and reasonably vandalism resistant for easy maintenance. Contact Intercity Transit for details and current specifications.

2. Intercity Transit shelters shall be maintained by Intercity Transit. School bus stop shelters shall be maintained by the subdivision's Homeowner's Association or apartment owner, which ever is appropriate.

3. Shelter size shall be appropriate to anticipated service and use. The size of Intercity Transit shelter shall be determined by Intercity Transit and the City. School bus shelters shall provide a minimum of 50 square feet of shelter for each 25 lots in a subdivision or each 25 two or more bedroom units in an apartment complex.

F. Designing quality into the walk to and wait at a bus stop facility is an important design consideration. A pedestrian friendly environment shall be designed into all bus stop locations and surrounding service area to make bus stop use easy, friendly, and safe. The following pedestrian friendly criteria shall be applied by the Development Services Division to bus stop facilities.

1. Provide walkways paved with a hard all weather surface linking various sections of subdivision and developments to peripheral streets with bus stops.

2. In designing walkways provide access through mid-blocks to decrease distances to bus facilities and flexibility to pedestrians.

3. Provide wheel chair ramps and other facilities consistent with barrier free design standards along walkways leading to bus stops.

4. Developments enclosed by walls or fences shall provide openings or gates for walkways to provide direct access between developments and bus facilities.

5. Use street signs to mark pedestrian walkways.

6. Separate roads and parking areas from pedestrian pathways by grade separations, landscaping and other devises. A minimum 4-6 foot planting strip with trees shall be provided to buffer sidewalks or walkways from streets and parking areas. When possible a second row of trees should be provided between the sidewalk and adjacent property.

7. Provide pedestrian facilities such as lighting (minimum one foot candle illumination), signs, and trash cans as warranted by anticipated use.

8. New development street systems should be designed so as to minimize pedestrian travel to bus stops.

4.45 Mailboxes

A. During construction, existing mailboxes shall be accessible for the delivery of mail or, if necessary, moved to a temporary location. Temporary relocation shall be coordinated with the U.S. Postal Service. The mailboxes shall be reinstalled at the original location or, if construction has made it impossible, to a location as outlined below and approved by the U.S. Postal Service.

B. Location

1. Bottom or base of box shall be 36" to 42" above the road surface.

2. Front of mailbox 18 inches behind vertical curb face or outside edge of shoulder. There will be a flaring of sidewalk around the mailbox area so that minimum sidewalk width is maintained.

3. New developments: Clustered mailboxes are required. Contact the U.S. Postal Service for details.

C. Mailboxes shall be set on posts strong enough to give firm support but not to exceed 4 x 4 inch wood or one 1 1/2 inch diameter pipe, or material and design with comparable breakaway characteristics.

4.46 Guard Rails

For purposes of design and location, all guard rails along roadways shall conform to the criteria of the "Washington State Department of Transportation Design Manual" as may be amended or revised.

4.47 Retaining Walls on Private Property

Retaining walls on private property shall be designed in conformance with the Uniform Building Code.

4.48 Retaining/Erosion Control Walls Within Public Rights-of-Way:

Rock, mortared or proprietary block (i.e. Keystone, Cottagestone) walls may be used for erosion protection of cut or fill embankments in stable soil conditions which will result in no significant foundation settlement or outward thrust upon the walls.

A. For wall heights over 6 feet, when soil is unstable or when outward thrust exists, structural walls of acceptable design stamped by a professional engineer qualified in retaining wall design shall be used. Walls over 6 feet high shall be subject to special inspection as outlined in the following paragraph.

B. Walls over 30 inches high in a fill section shall require an engineered design by a professional engineer qualified in retaining wall design. The construction of the wall shall be continuously inspected by a qualified special inspector as it progresses. The special inspector shall submit inspection reports, including compaction test results and photographs taken during the construction, documenting the techniques used and the degree of conformance to the design.

C. Rock walls not requiring an engineered design shall be approved by the Development Services Department and designed and constructed in conformance with Drawing No. ST-34 and as follows:

1. The rock material shall be as nearly rectangular as possible. No stone shall be used which does not extend through the wall. The rock material shall be hard, sound, durable and free from weathered portions, seams, cracks and other defects. The rock density shall be a minimum of 160 pounds per cubic foot.

2. The rock wall shall be started by excavating a trench having a depth below subgrade of one half the base course or one foot whichever is greater.

3. Rock selection and placement shall be such that there will be minimum voids and, in the exposed face, no open voids over 6 inches across in any direction. The final top course shall have a continuous appearance and shall be placed to minimize

erosion of the backfill material. The larger rocks shall be placed at the base of the rockery so that the wall will be stable and have a stable appearance. The rocks shall be placed in a manner such that the longitudinal axis of the rock shall be at right angles or perpendicular to the rockery face. The rock shall have all inclining faces sloping to the back of the rockery. Each course of rocks shall be seated as tightly and evenly as possible on the course beneath. After setting each course of rock, all voids between the rocks shall be chinked on the back with qnarry rock to eliminate any void sufficient to pass a 2 inch square probe.

4. The wall backfill shall consist of 1-1/2 inch washed drain rock. This material shall be placed to a 8 inch minimum thickness between the entire wall and the cut or fill material. The backfill material shall be placed in lifts to an elevation approximately 6 inches below the top of each course of rocks as they are placed, until the uppermost course is placed. Any backfill material on the bearing surface of one rock course shall be removed before setting the next course.

5. Perforated drainage pipe 4-inch minimnm diameter shall be placed within the backfill area at the base of the wall. Filter fabric shall be installed between the wall and the backfill and along the bottom of the drainage pipe. Outflow from the perforated drainage pipe needs to be properly addressed as part of the drainage design for the project.

D. Mortared walls not requiring an engineered design shall be constructed to the same overall dimensions and requirements as rock walls except that smaller size rocks may be joined together with mortar to achieve the overall wall dimension.

E. Proprietary block walls not requiring an engineered design shall be constructed to the specifications provided by the manufacturer. These specifications must be submitted to the Development Services Department.

4.49 Street Trees

All streets classified as arterial and collector as per this Development Guide Manual shall have street trees planted as provided below. Shrubs and ground cover are optional, but if used it shall be chosen from the list below.

A. Species of trees, shrubs and groundcover must be chosen from the following, or equal, as determined by the Community Development Services Director. No plant species currently listed by the Washington State Noxious Weed Control Board may be planted.

TREES:

Trees below are listed in order of Urban Forester preference first, then in alphabetical order by scientific name. Only select species that meet the planting strip width for the design. A diversity of species is strongly encouraged, please choose more than one species for your design.

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Calocedrus decurrens	Incense Cedar	Large Columnar	60	20	No	6
Carpinus japonica	Japanese Hornbeam	Small Spreading	20	25	Yes	6
Cornus alternifolia	Pagoda Dogwood	Medium Spreading	25	25	Yes	6
Cornus 'Aurora'	Aurora © Dogwood	Small Spreading	18	18	Yes	6
Cornus controversa 'June Snow'	Giant Dogwood	Medium Spreading	30	40	Yes	7
Cornus 'Eddie's White Wonder'	Eddie's White Wonder Dogwood	Medium Spreading	30	20	Yes	6
Cornus elwinortonii 'KN30-8'	Venus © Dogwood	Medium Spreading	25	20	Yes	7
Cornus elwinortonii 'KN4-43'	Starlight © Dogwood	Medium Spreading	30	20	Yes	7
Cornus florida	Flowering Dogwood	Medium Spreading	25	25	Yes	6
Cornus 'Rutcan'	Constellation © Dogwood	Medium Spreading	25	20	Yes	6
Cornus 'Rutdan'	Celestial © Dogwood	Medium Spreading	25	20	Yes	6
Lagerstroemia indica x fauriei	Hybrid Crape Myrtle	Small Spreading	20	20	Yes	6
Magnolia grandiflora 'Victoria'	Victoria Evergreen Magnolia	Medium Spreading	25	20	Yes	6

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Magnolia x 'Elizabeth'	Elizabeth Magnolia	Medium Spreading	30	20	Yes	6
Magnolia x 'Galaxy'	Galaxy Magnolia	Medium Spreading	25	25	Yes	6
Nyssa sylvatica 'David Odom'	Afterburner © Black Tupelo	Medium Spreading	40	25	No	6
Nyssa sylvatica 'Firestarter'	Firestarter © Black Tupelo	Medium Spreading	40	25	No	6
Nyssa sylvatica 'Haymanred'	Red Rage © Black Tupelo	Medium Spreading	40	25	No	6
Nyssa sylvatica 'JFS-PN Legacy 1'	Gum Drop © Tupelo	Medium Spreading	30	20	Yes	6
Nyssa sylvatica 'Sheri's Cloud'	Sheri's Cloud Black Tupelo	Medium Spreading	40	25	No	6
Nyssa sylvatica 'Wildfire'	Wildfire Black Tupelo	Medium Spreading	40	25	No	6
Acer circinatum	Vine Maple	Medium Spreading	25	20	Yes	8
Acer griseum	Paperbark Maple	Medium Spreading	30	25	No	8
Arbutus unedo 'Marina'	Strawberry Tree	Medium Spreading	25	20	Yes	6
Crataegus x lavalii	Lavalle Hawthorne	Small Spreading	20	20	Yes	6
Pinus contorta var.contorta	Shore Pine	Large Spreading	50	40	No	8
Quercus robur 'Fastigata'	Skyrocket Oak	Medium Columnar	45	15	No	8
Betula nigra 'Heritage'	Heritage River Birch	Pyramidal	60'	40'	no	6
Cedrus atlantica 'Fastigiata'	Atlas Cedar 'Fastigiata'	Columnar	60'	10'	No	6
Celtis occidentalis	Northern Hackberry	Pyramidal	70'	n/a	No	6
Araucaria araucana	Monkey Puzzle Tree	Pyramidal	80'		No	8+
Cedrus atlantica	Atlas Cedar	Pyramidal	80'		no	10
Cryptomeria japonica	Japanese Sugi Cedar	Conical	80'	n/a	no	8

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Amelanchier laevis 'Lastre Allegheny'	Lustre Allegheny Serviceberry	Medium Spreading	25	18	Yes	6
Amelanchier x grandiflora 'Princess Diana'	Princess Diana Serviceberry	Small Spreading	20	15	Yes	6
Amelanchier x grandiflora 'Robin Hill'	Robin Hill Serviceberry	Medium Spreading	25	15	Yes	6
Amelanchier x grandifloria 'Autumn Brilliance'	Autumn Brilliance Serviceberry	Small Spreading	20	15	Yes	6
Carpinus betulus	European Hornbeam	Medium Spreading	40	25	No	6
Carpinus betulus 'Columnaris'	Columnar European Hornbeam	Medium Columnar	35	15	No	6
Carpinus betulus 'Fastigata'	Pyramidal European Hornbeam	Medium Columnar	40	15	No	6
Carpinus caroliniana	American Hornbeam	Medium Spreading	25	20	Yes	6
Carpinus caroliniana "CCSU'	Palisade © American Hornbeam	Medium Columnar	30	15	Yes	4
Carpinus caroliniana "Uxbridge'	Rising Fire American Hornbeam	Medium Columnar	30	15	Yes	3
Carpinus caroliniana 'J.N. Upright'	Firespire © American Hornbeam	Medium Spreading	30	35	Yes	4
Carpinus caroliniana 'JFS-KW6'	Native Flame © American Hornbeam	Medium Spreading	30	25	Yes	4
Eucommia ulmoides	Hardy Rubber Tree	Large Spreading	50	40	No	7
Lagerstroemia indica x fauriei	Muskogee' Crape Myrtle	Small Spreading	20	20	Yes	6
Lagerstroemia indica x fauriei	Natchez' Crape Myrtle	Small Spreading	20	20	Yes	6
Lagerstroemia indica x fauriei	Tuscarora' Hybrid Crape Myrtle	Small Spreading	20	20	Yes	6
Magnolia denudata	Yulan Magnolia	Medium Spreading	40	40	No	8
Magnolia x soulangeana 'Rustica Rubra'	Rustica Rubra Saucer Magnolia	Medium Spreading	25	20	Yes	6

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Ostrya virgiana	Ironwood/American Hophornbeam	Medium Spreading	40	25	No	8
Oxydendron arboreum	Sourwood	Medium Columnar	35	12	No	6
Pinus flexilis 'Vanderwolf's Pyramid'	Limber Pine	Medium Columnar	35	15	No	6
Ulmus parvifolia 'Emer II'	Alee Elm	Medium Spreading	45	35	No	8
Ulmus x 'Frontier'	Frontier Elm	Medium Spreading	40	30	No	7
Abies grandis	Grand Fir	Large Columnar	80	25	No	10+
Abies pinsapo	Spanish Fir	Large Spreading	50	30	No	8
Acer buegerianum	Trident Maple	Medium Spreading	30	30	Yes	6
Acer glabrum	Rocky Mt. Maple	Medium Spreading	30	20	Yes	6
Acer tataricum	Tartarian Maple	Small Spreading	20	20	Yes	6
Aesculus hippocastanum 'Baumannii'	Fruitless Horsechestnut	Large Spreading	55	40	No	8
Alnus rubra	Red Alder	Large Spreading	50	30	No	
Amelanchier x hybrida	Cumulus Serviceberry	Medium Spreading	25	15	Yes	6
Azara microphylla	Boxleaf Azara	Small Columnar	18	10	Yes	6
Betula albonsinensis var. septentrionalis	Northern Chinese Red Birch	Medium Spreading	40	35	No	6
Cedrus deodara	Deodar Cedar	Large Spreading	50	35	No	10+
Chionanthus retusus	Chinese Fringetree	Small Spreading	20	25	Yes	6
Chitalpa tashkentensis 'Pink Dawn'	Chitalpa	Medium Spreading	35	30	No	6
Cupressus bakeri	Baker Cypress	Large Spreading	50	35	No	6
Davidia involucrata	Dove Tree	Medium Spreading	40	30	No	8
Frangula purshiana	Cascara	Medium Spreading	30	20	Yes	10+
Gymnocladus dioicus	Kentucky Coffeetree	Large Spreading	60	40	No	7

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Gymnocladus dioicus 'Espresso'	Espresso Kentucky Coffeetree	Large Spreading	50	35	No	8
Halesia monticola	Mountain Silverbell	Medium Columnar	45	25	No	6
Halesia tetraptera	Carolina Silverbell	Medium Spreading	35	30	No	6
Koelreuteria paniculata	Goldenrain Tree	Medium Spreading	30	30	Yes	6
Maackia amurensis	Amur Maackia	Medium Spreading	30	20	Yes	6
Metasequioa glyptostroboides	Dawn Redwood	Large Columnar	50	25	No	10+
Pinus densiflora 'Umbraculifera'	Dwarf Japanese Red Pine	Small Spreading	20	25	Yes	8
Pinus heldreichii	Bosnian Pine	Large Columnar	65	30	No	8
Pistacia chinensis	Chinese Pistache	Medium Spreading	35	25	No	6
Platanus x acerifolia	London Planetree	Large Spreading	50	40	No	10+
Platanus x acerifolia 'Bloodgood'	Bloodgood London Planetree	Large Spreading	50	40	No	10+
Platanus x acerifolia 'Columbia'	Colombia London Planetree	Large Spreading	55	40	No	8
Platanus x acerifolia 'Exclamation'	Exclamation © London Planetree	Large Spreading	55	40	No	10+
Prunus x yedoensis 'Akebono'	Akebono Flowering Cherry	Medium Spreading	25	25	Yes	6
Pseudotsuga menziesii	Douglas-fir	Large Columnar	300	25	No	10+
Pterostyrax hispida	Fragrant Epaulette Tree	Medium Spreading	40	30	No	6
Quercus alba	White Oak	Large Spreading	50	45	No	8
Quercus coccinea	Scarlet Oak	Large Spreading	60	40	No	8
Quercus hypoleucoides	Silverleaf Oak	Large Spreading	50	35	No	6
Quercus ilex	Holly Oak	Large Spreading	50	40	No	6
Quercus macrocarpa	Bur Oak	Large Spreading	70	45	No	8
Quercus muehlenbergii	Chinkapin Oak	Large Spreading	50	50	No	10+
Quercus shumardii	Shumard Oak	Large Spreading	75	55	No	8

Scientific Name	Common Name	Form	Mature Height (ft)	Spread (ft)	Under Wires	Planting Strip Width (ft)
Quercus velutina	Black Oak	Large Spreading	60	50	No	8
Sophora japonica	Japanese Pagodatree	Large Spreading	60	40	No	6
Sophora japonica 'Regent'	Japanese Pagodatree	Medium Spreading	45	40	No	8
Styrax japonicus 'Emerald Pagoda'	Emerald Pagoda Japanese Snowbell	Medium Spreading	25	20	Yes	6
Styrax japonicus 'JFS-E'	Snow Charm © Japanese Snowbell	Medium Spreading	25	20	Yes	6
Styrax japonicus 'Pink Chimes'	Pink Chimes Japanese Snowbell	Medium Spreading	25	20	Yes	6
Styrax obassia	Fragrant Styrax	Medium Spreading	25	20	Yes	6
Taxodium distichum 'Mickelson'	Shawnee Brave® Bald Cypress	Large Columnar	55	20	No	8
Thuja plicata	Western redcedar	Large Columnar	150	30	No	10+
Tilia cordata 'De Groot'	De Groot Littleleaf Linden	Medium Spreading	30	20	Yes	6
Tilia tomentosa 'Sterling'	Silver Linden	Medium Spreading	45	30	No	8
Tsuga heterophylla	Western Hemlock	Large Columnar	80	30	No	10+

SHRUBS:

Salal – *Gaulteria shallon* – part shade to shade, native

Alpine Laurel – *Kalmia micrphyllia* – full sun

Hollyleaved barberry – *Mahonia aquifolium* – part shade, shade, native

Evergreen Huckleberry – *Vaccinium ovatum* - partial shade, native, drought-tolerant

Red Huckleberry – *Vaccinium parvifolium* – native

Oregon boxwood – *Paistima myrsinites* - native

Pacific ninebark – *Physocarpus capitatus* - native

Mock Orange – *Philadelphus lewisii* – native, drought-tolerant

Nootka rose – *Rosa nutkana* - native

Fraser Photina - *Photinia fraseri*

Viburnum - *Viburnum Davidii* or *V. Opulus Compactum*

Japanese Privet - *Ligustrum texanum*

Siberian Dogwood - *Cornus alba sibirica*

Evergreen Azalea (Gable Hybrids, Glenn Dale Hybrids)

Rhododendron – *Rhododendron spp.*

Deciduous Azaleas (Knap Hill, Exbury Hybrids, Mollis, and Occidentale Hybrids)

GROUNDCOVER:

Kinnikinnik – *Arctostaphylos uva-ursi* – sun to part shade, native, drought-tolerant

Creeping barberry – *Mahonia repens* – native, drought-tolerant

Wild Ginger – *Asarum caudatum* - native, part to full shade

Bleeding Heart – *Dicentra formosa* – native

Beach strawberry – *Fragaria chiloensis* - native

Wintercreeper - *Euonymus fortunei*

Bearbery Cotoneaster - *Cotoneaster dammeri*

Japanese Spruge - *Pachysandra terminalis*

Carpet Bugle - *Ajuga*

B. Planting Size: Trees, 2 or 3-inch caliper, measured 6 inches above base. Ground cover , 4-inch pot spaced 18 to 20 inches on center or 1-gallon pots at 20 inches on center. Low growth shrubs (i.e. Viburnum), 1-gallon pots at 3 feet on center. Shrubs (i.e. rhododendron), 18 to 24 inches in height at 5 feet on center or 3-gallon pot at 5 feet on center.

C. Location: Trees shall be located at least three (3) feet behind the backside of the curb on both sides of the street. Trees shall be spaced 30 feet on center starting 15 feet from the property line. Tree spacing may be adjusted slightly to allow a 10-foot clear zone on either side of a driveway. In cases where street trees will be planted at street intersections, the developer will need to coordinate the location of trees and shrubs planted in these areas with city staff.

D. Planter strips: Planting strips shall be a minimum of 6 feet in width in order to provide adequate root space and water infiltration for street trees. Planter strips as shown on the alternate street designs may vary from a minimum of 4 feet, with specific species utilized suited to fit such small planter strips. Utility poles and light standards placement is allowed in required planting strips.

E. Maintenance: All trees, shrubs and other vegetation should be maintained in a healthy growing condition. Dead or dying plants shall be replaced as soon as possible and the planting area should be reasonably free of weeds and trash. Trees, plants, shrubs or vegetation or parts thereof, which constitute a hazard to any public street, sidewalk, sewer or underground utility, pedestrian or vehicular traffic must be removed. All developments required to plant street trees will also be required to maintain the trees for the life of the project, regardless of ownership. This shall be accomplished as follows:

RESIDENTIAL SHORT PLATS AND LONG PLATS

Responsibility for maintenance of required landscape plantings within the right-of-way shall be clearly identified on the face of the final short plat or long plat drawing. The language should be as follows, or of similar substance:

Note: Maintenance of required landscaping within the public right-of-way is the sole responsibility of the (property owners) or (homeowners association) within this land division. The City of Tumwater has no responsibility to maintain or service said landscaping.

In the event the maintenance agreement is not honored by a landowner despite efforts made by the City to enforce, the City may take over maintenance responsibilities at the expense of the landowner.

COMMERCIAL PROJECTS

The proponent of a commercial project which is required to plant street trees shall submit a maintenance agreement for the landscaping within the public right-of-way on a form approved by the City Attorney. This agreement shall be filed with the Thurston County Auditor's office and shall run with the land regardless of ownership.

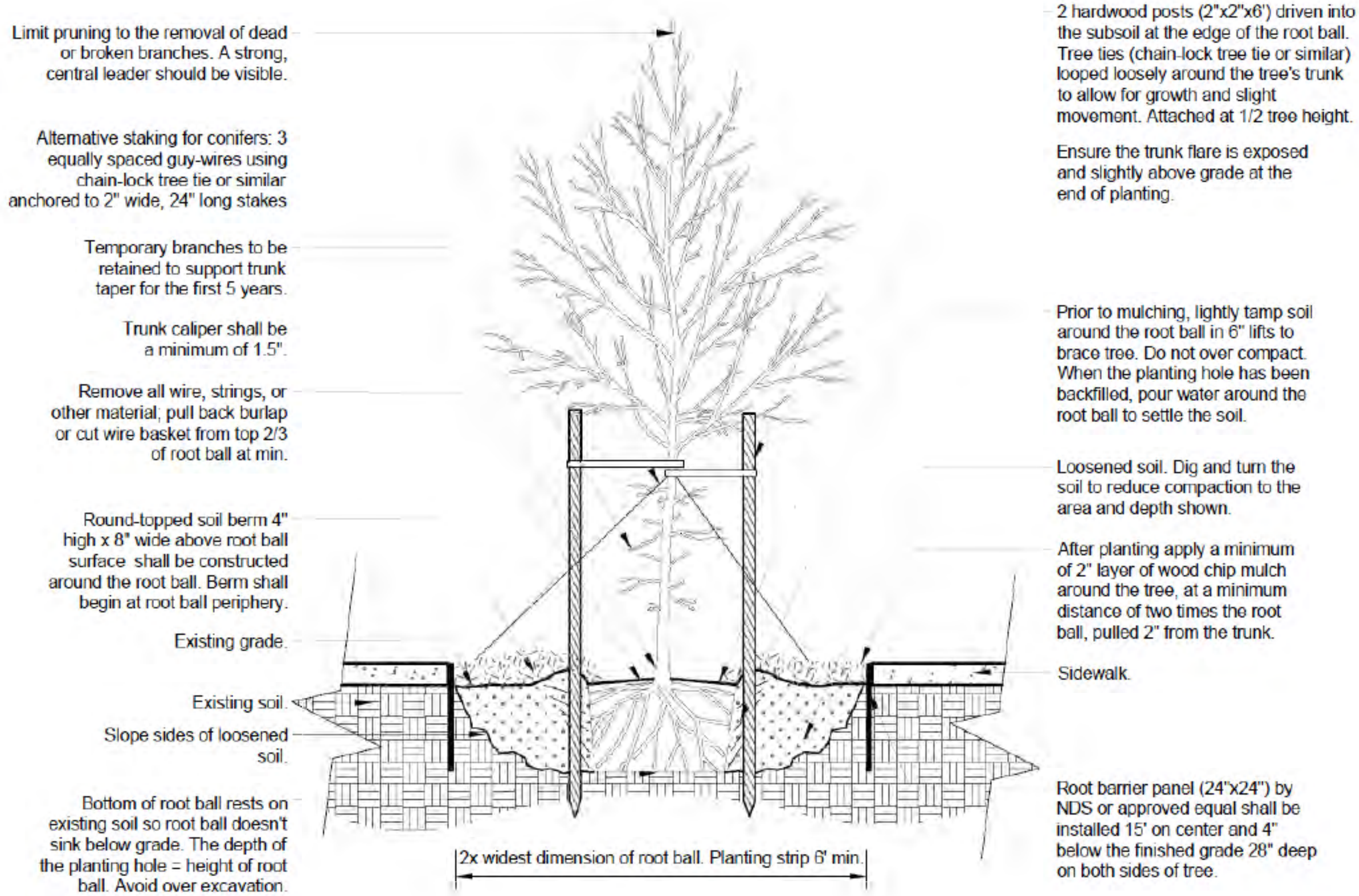
Pursuant to the terms of the maintenance agreement, in the event of a breach by the property owner, the City shall be authorized to take over maintenance responsibilities at the expense of the landowner.

F. Exceptions to the planting theme may be made by the City. Exceptions include but are not limited to; screening industrial areas; planting around historical sites; maintaining natural vegetation that better serves as street landscaping or beautification, where any of the above are compatible with the applicable zoning requirements.

If inadequate right-of-way exists, required plants may be placed in yard setback areas. If the improvements are associated with a City project and inadequate right-of-way exists, the planting may be deferred until such time as the adjoining property develops.

[…]

ST-31 Tree Planter and Barrier Detail



Planting notes:

1. Stakes installed only if necessary and shall be removed after 1 year of growth.
2. Nursery stakes and ties shall be removed at the time of planting.
3. Deciduous trees shall be 1.5" in caliper and coniferous trees 6' tall, unless approved by the Field Arborist.
4. Planting Guidance and best management practices outlined in the Street Tree Plan shall be followed.

All root materials including, but not limited, to wires, burlap, etc., shall be removed and compacted soil on the root ball shall be knocked loose prior to planting.

4.50 Parking Lot

Construction of all parking lots, whether part of a development project covered by the Development Review process or not, shall be required to go through site plan review and receive site plan approval.

Two sets of plans and specifications shall be required to be submitted for review and approval by the City with respect to storm drainage, matching street and/or sidewalk grades, access locations, parking layout, and to check for future street improvement conformity and City zoning regulations. Grading permits are required in accordance with the Uniform Building Code.

Storm water retention shall be provided and shall follow the criteria as set forth in the Thurston Region Stormdrainage Manual which is a part of these standards.

Parking lot surfacing materials shall satisfy the requirement for a permanent all-weather surface. Asphalt concrete pavement, cement concrete pavement, and turfstone type pavers satisfy this requirement and are approved materials. Gravel surfaces are not acceptable or approved surface material types. Combination grass/paving systems are approved surface material types, however, their use requires submittal of an overall parking lot paving plan showing the limits of the grass/paving systems and a description of how the systems will be irrigated and maintained. If the Development Services Engineer determines the grass/paving system is not appropriate for the specific application, alternate approved surfacing materials shall be utilized.

Minimum requirements for parking lot capacity shall be determined at Development Review. The configuration of the stalls shall be as outlined in TMC 18.50.

4.51 Pavement Analysis and Design Amended October 9, 2023

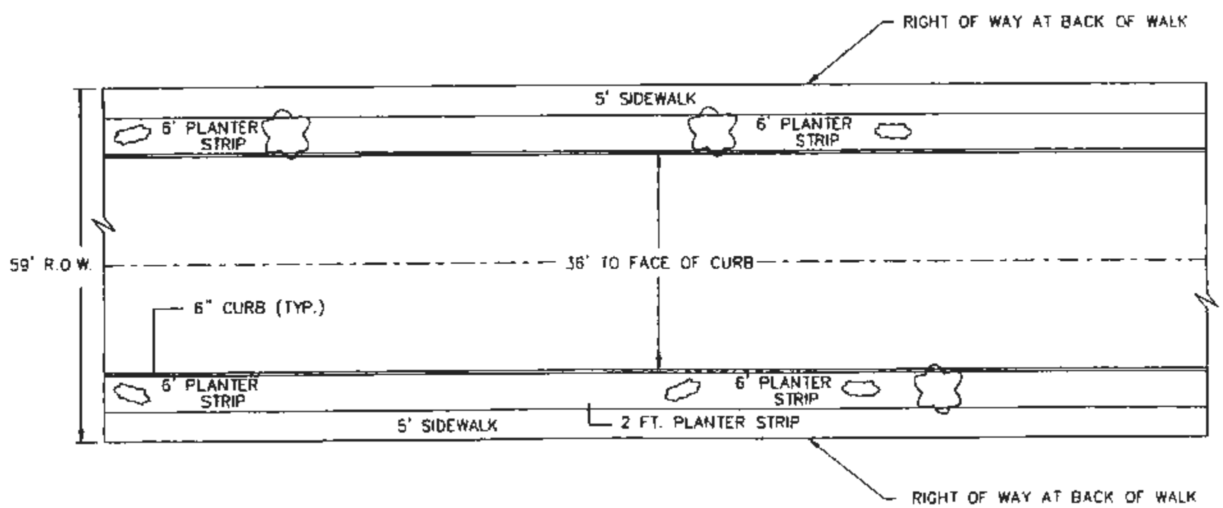
In lieu of adhering to the minimum structural design sections as shown in City of Tumwater Street Section Design table, the applicant may submit for consideration an alternative pavement analysis and design. The design is required to be completed by a licensed professional engineer or geologist. The design shall adhere to the criteria listed below.

1. 30-year design life
2. 90% reliability
3. 2.0 serviceability loss (delta PSI)
4. Layer coefficients: HMA – 0.42, Crushed Surfacing – 0.14, Structural Fill – 0.10 prescriptive to be adjusted depending on material type

The ESAL calculation shall be the greater of approved ADT from traffic study or 25,000 for Arterials, 10,000 for Commercial/Industrial Collectors, 15,000 for Urban Collectors, and 5,000 for local residential road types.

The City reserves the right to revise pavement design parameters where deemed appropriate at its sole discretion.

CHAPTER 4 - TRANSPORTATION
LIST OF DRAWINGS



CITY OF TUMWATER

NEIGHBORHOOD COLLECTOR

DRAWN BY: SRJ	STD. PLAN NO. ST-01
CHECKED BY: JRN	DATE: 06-08-95

CITY OF TUMWATER

NEIGHBORHOOD COLLECTOR

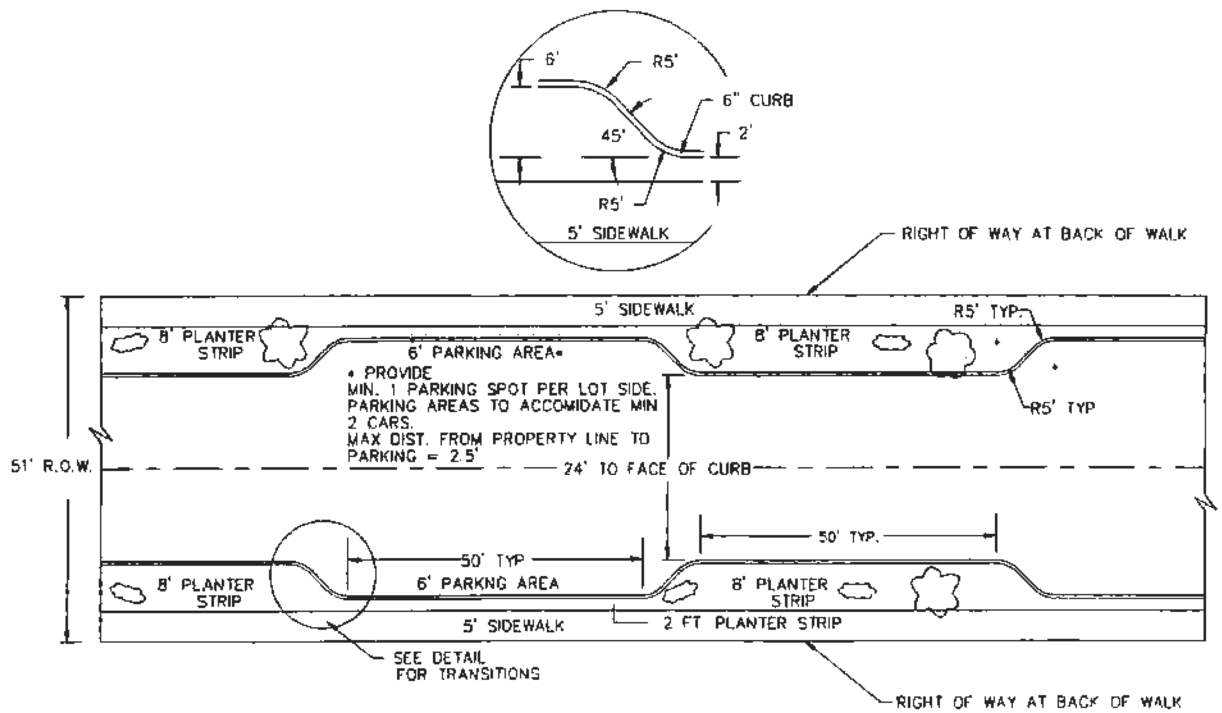
(ALTERNATE)

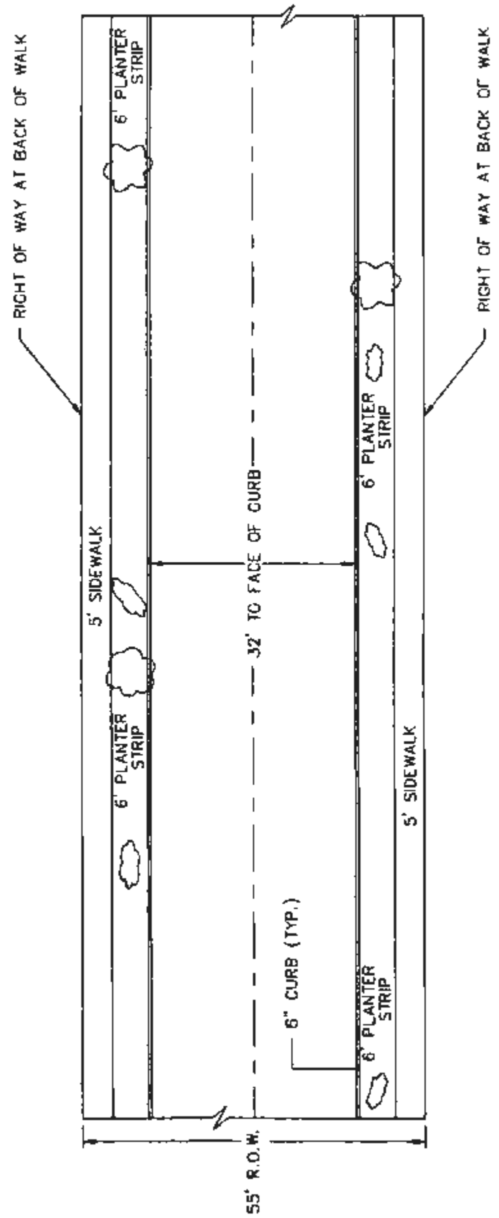
DRAWN BY: SRJ

CHECKED BY: JRN

STD PLAN NO. ST-02

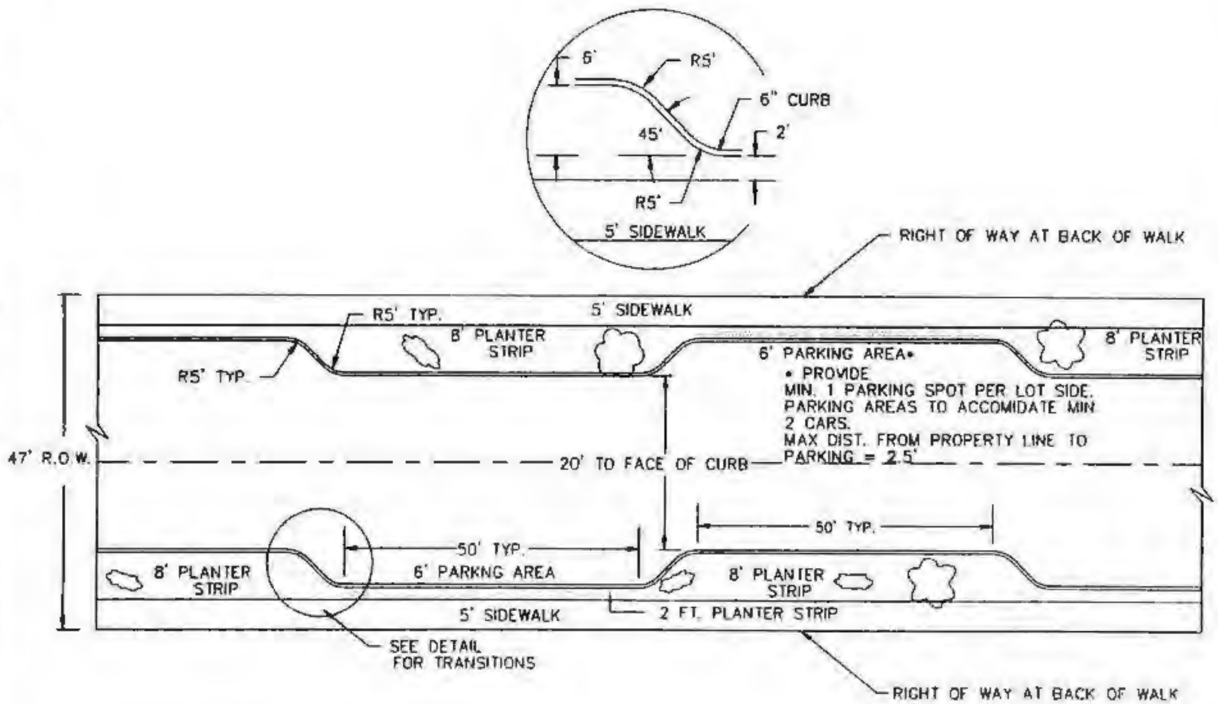
DATE: 06-08-95





CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-03
LOCAL RESIDENTIAL	CHECKED BY: JRN	DATE: 06-08-95

CITY OF TUMWATER
LOCAL RESIDENTIAL
(ALTERNATE)



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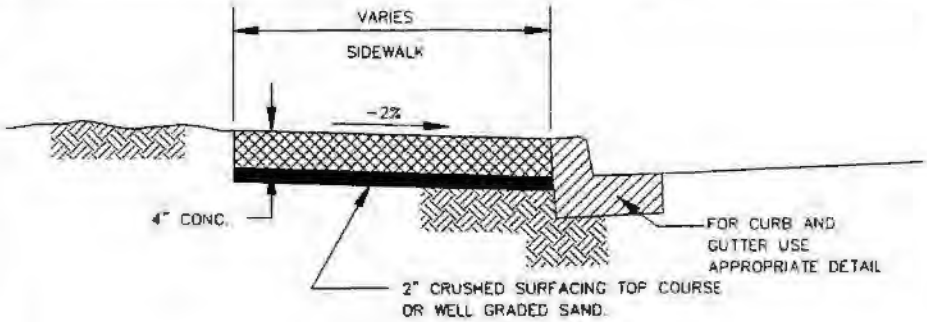
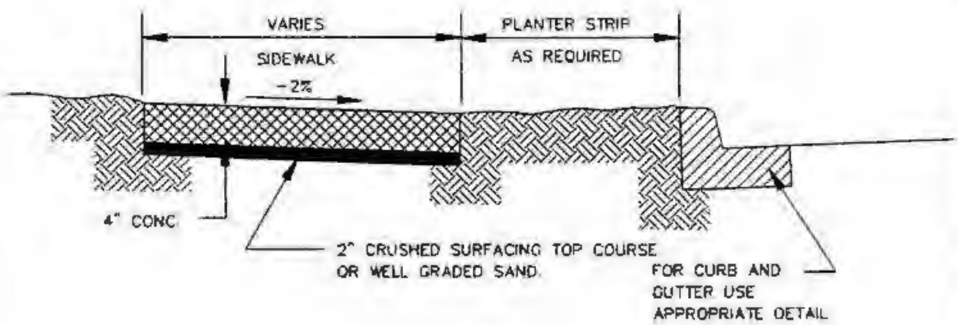
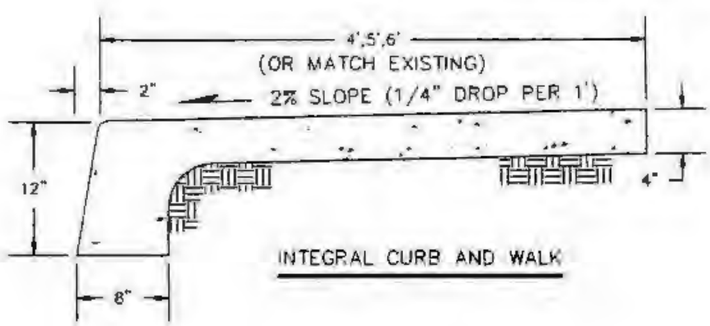
CHECKED BY: JRN	DATE: 06-08-95





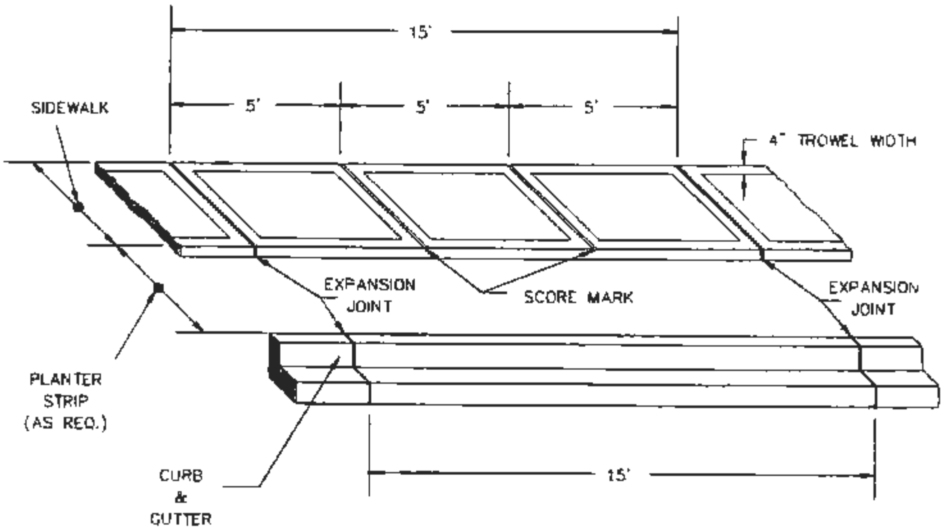


INTEGRAL CURB AND WALK

GENERAL NOTES:

1. FOR JOINTS AND SCORING,SEE APPROPRIATE STANDARD FOR SIDEWALK SPACING, EXPANSION JOINTS, AND SCORE MARKS.
2. CONCRETE DRIVEWAYS REQUIRE A MINIMUM DEPTH OF 6".
3. CURB AND WALK CONSTRUCTION IS TO CONFORM FO CITY OF TUMWATER CURB AND SIDEWALK STANDARDS, UNLESS OTHERWISE DIRECTED BY ENGINEER.
4. COMPACTION FOR CONCRETE CURB AND WALKS TO BE 95% OR MAXIMUM DENSITY. SEE SECTION 42-3.01 A.P.W.A.

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-05
SIDEWALK DETAIL	CHECKED BY: JRN	DATE: 03-30-95



GENERAL NOTES.

1. EXPANSION JOINT MATERIAL TO BE 3/8" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE.

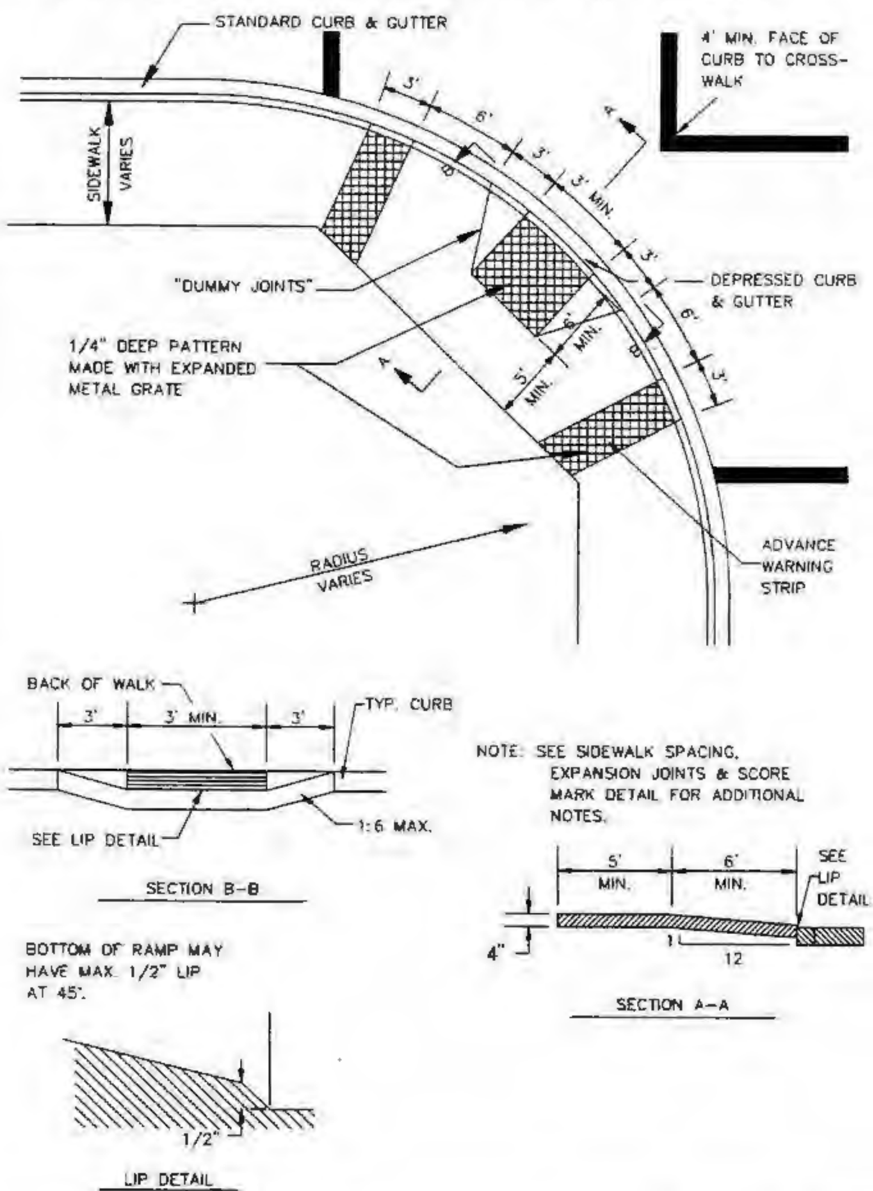
2. FORM AND SUBGRADE INSPECTION REQUIRED BEFORE PLACING CONCRETE.

3. SCORE MARKS SHALL BE ±1/8" WIDE BY ±1/4" DEEP. FOR SIDEWALKS OVER 8' IN WIDTH, A LONGITUDINAL SCORE MARK SHALL BE MADE ALONG CENTER OF WALK.

4. EXPANSION JOINTS SHALL BE INSTALLED IN CURB AND GUTTER AND IN SIDEWALK AT PC AND PT AT ALL CURB RETURNS. EXPANSION JOINTS SHALL BE PLACED IN SIDEWALK AT SAME LOCATIONS AS THOSE IN CURB AND GUTTER WHEN SIDEWALK IS ADJACENT TO CURB AND GUTTER, UNLESS OTHERWISE DIRECTED BY ENGINEER

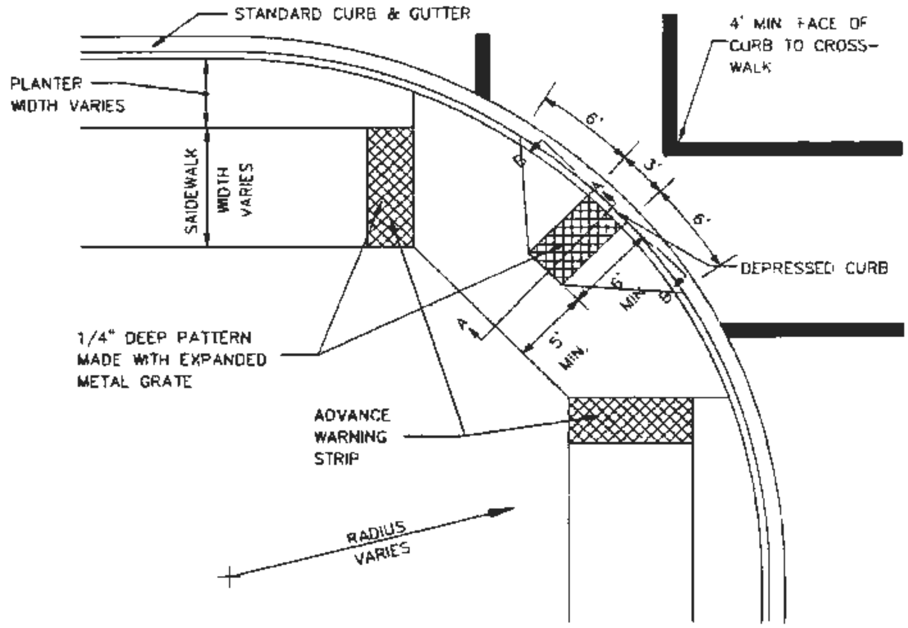
CITY OF TUMWATER SIDEWALK SPACING EXPANSION JOINTS & SCORE MARKS	DRAWN BY: SRJ CHECKED BY: JRN	STD. PLAN NO. ST-06 DATE: 03-28-95

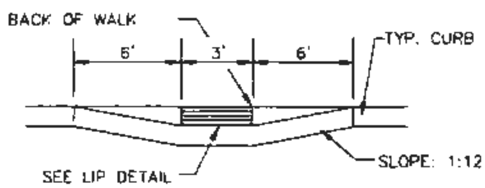
TYPICAL WHEELCHAIR RAMP



CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-07
WHEELCHAIR RAMP TYPE IA	CHECKED BY: JRN	DATE: 03-28-95

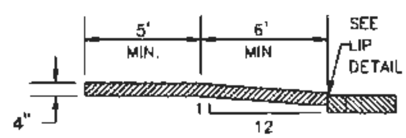
TYPICAL WHEELCHAIR RAMP



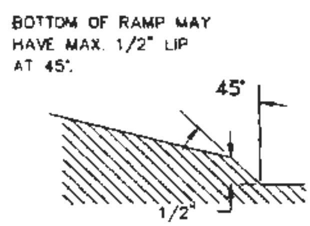


SECTION B–B

NOTE. SEE SIDEWALK SPACING, EXPANSION JOINTS & SCORE MARK DETAIL FOR ADDITIONAL NOTES.



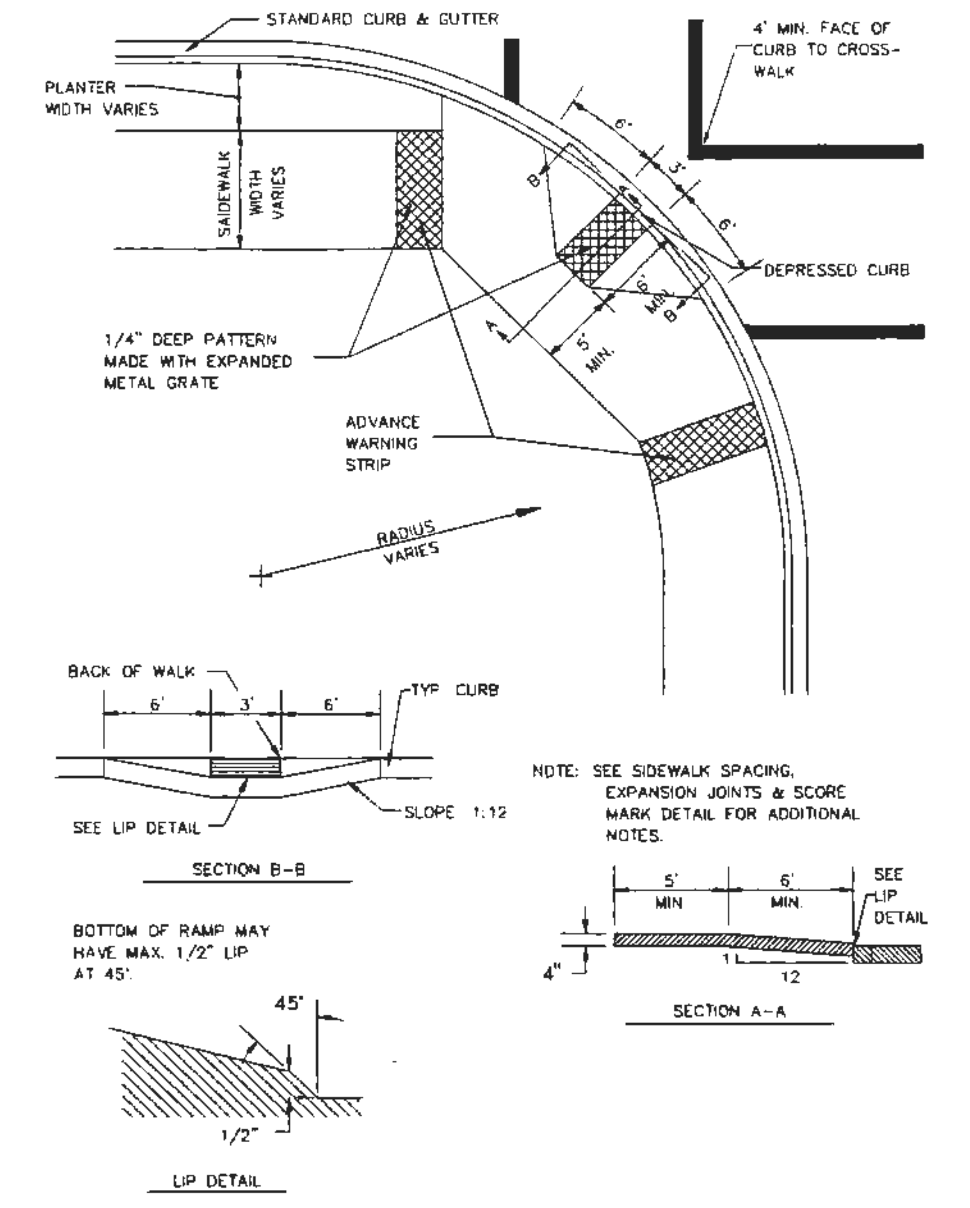
SECTION A–A



LIP DETAIL

CITY OF TUMWATER WHEELCHAIR RAMP TYPE IB	DRAWN BY: SRJ CHECKED BY: JRN	STD. PLAN NO. ST–08 DATE: 03–28–95

TYPICAL WHEELCHAIR RAMP



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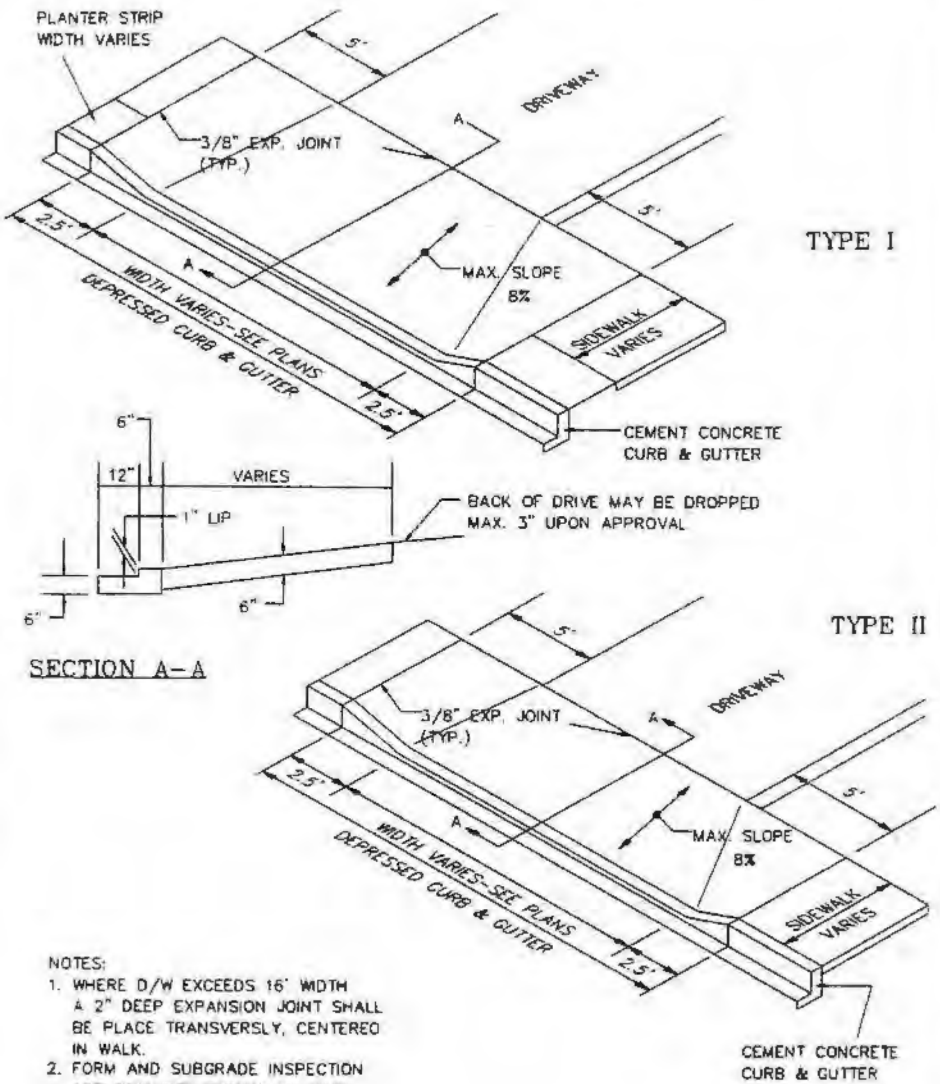
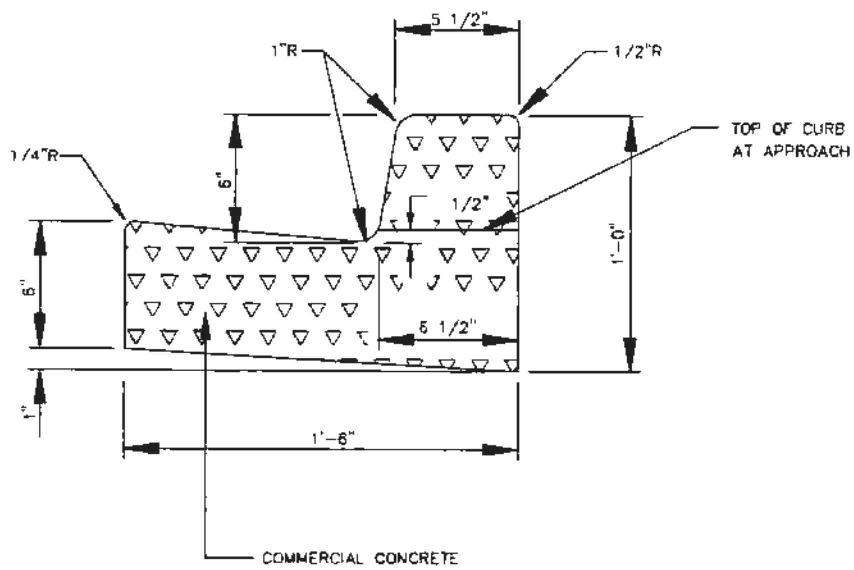
WHEELCHAIR RAMP TYPE IC	CHECKED BY: JRN	DATE: 03-28-95



NOTES:

1. WHERE D/W EXCEEDS 16' WIDTH A 2" DEEP EXPANSION JOINT SHALL BE PLACE TRANSVERSLY, CENTERED IN WALK.
2. FORM AND SUBGRADE INSPECTION ARE REQUIRED BEFORE PLACING CONCRETE.

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-10
CEMENT CONCRETE DRIVEWAY	CHECKED BY: JRN	DATE: 05-23-95



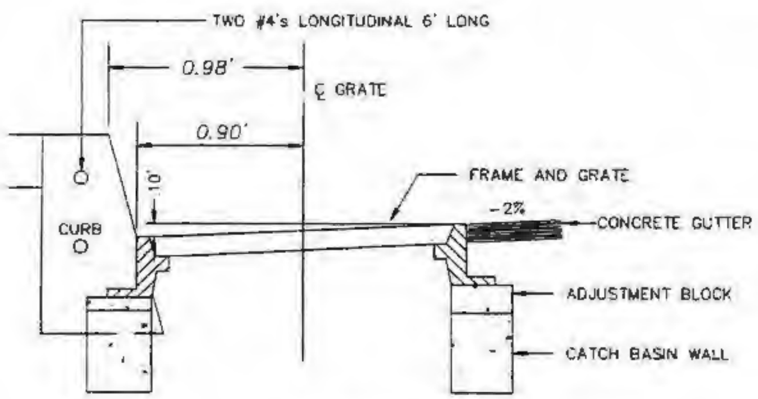
GENERAL NOTES:

1. EXPANSION JOINT MATERIAL TO BE 3/8" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE SPACING

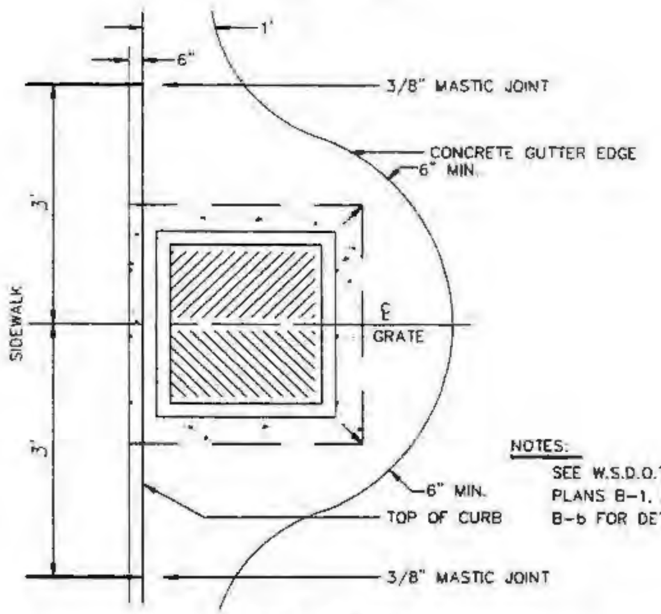
2. FORM AND SUBGRADE INSPECTION REQUIRED BEFORE PLACING CONCRETE.

SEE APPROPRIATE DETAIL FOR CURB AND GUTTER AROUND CATCH BASINS

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-11
CEMENT CONCRETE CURB & GUTTER	CHECKED BY: JRN	DATE: 03-30-95



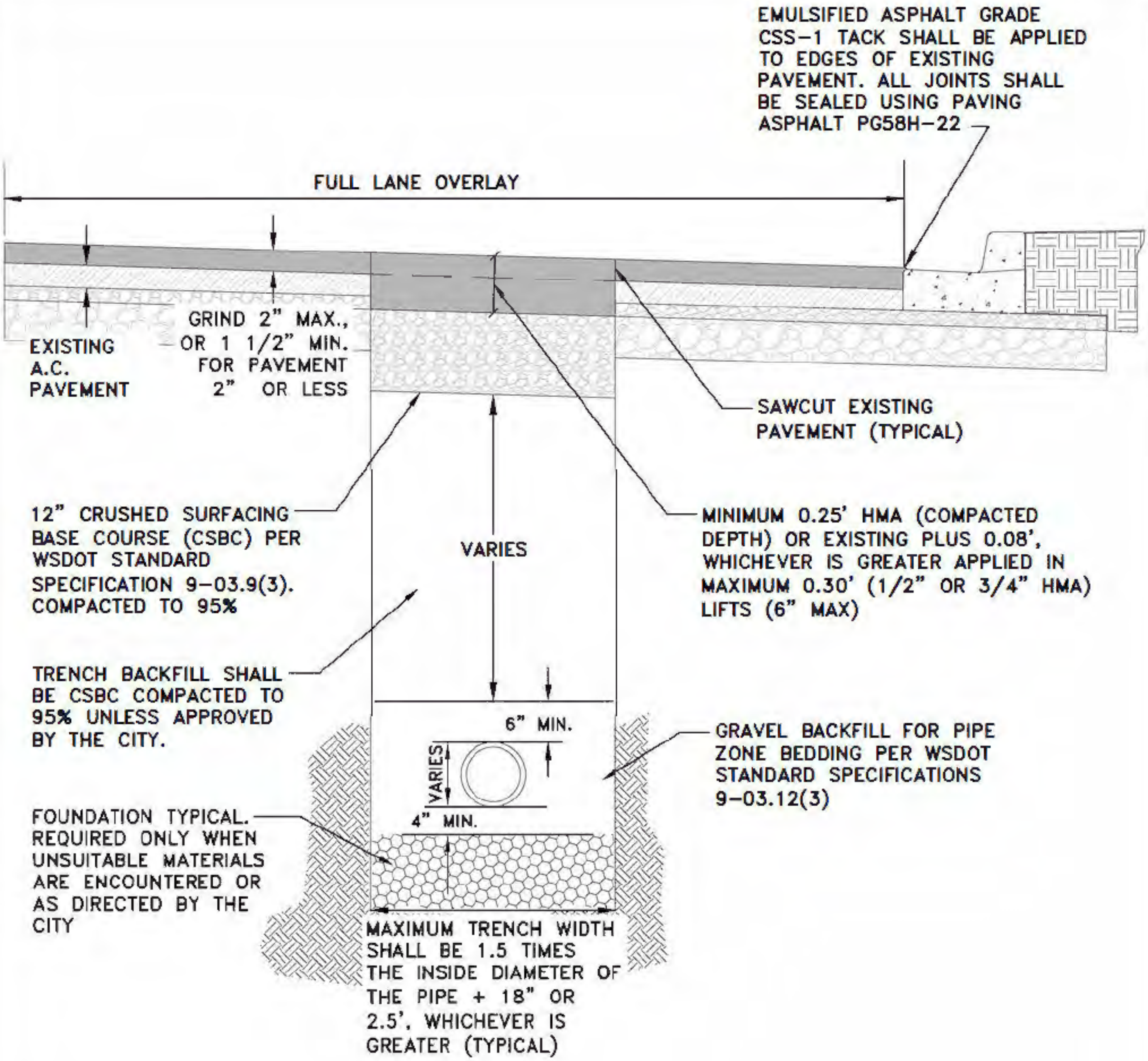
SIDE VIEW



NOTES:
SEE W.S.D.O.T. STANDARD PLANS B-1, B-2a, AND B-6 FOR DETAILS.

PLAN VIEW

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-12
STANDARD CATCH BASIN FRAME & GRATE DETAIL	CHECKED BY: JRN	DATE: 03-30-95



GENERAL NOTES:

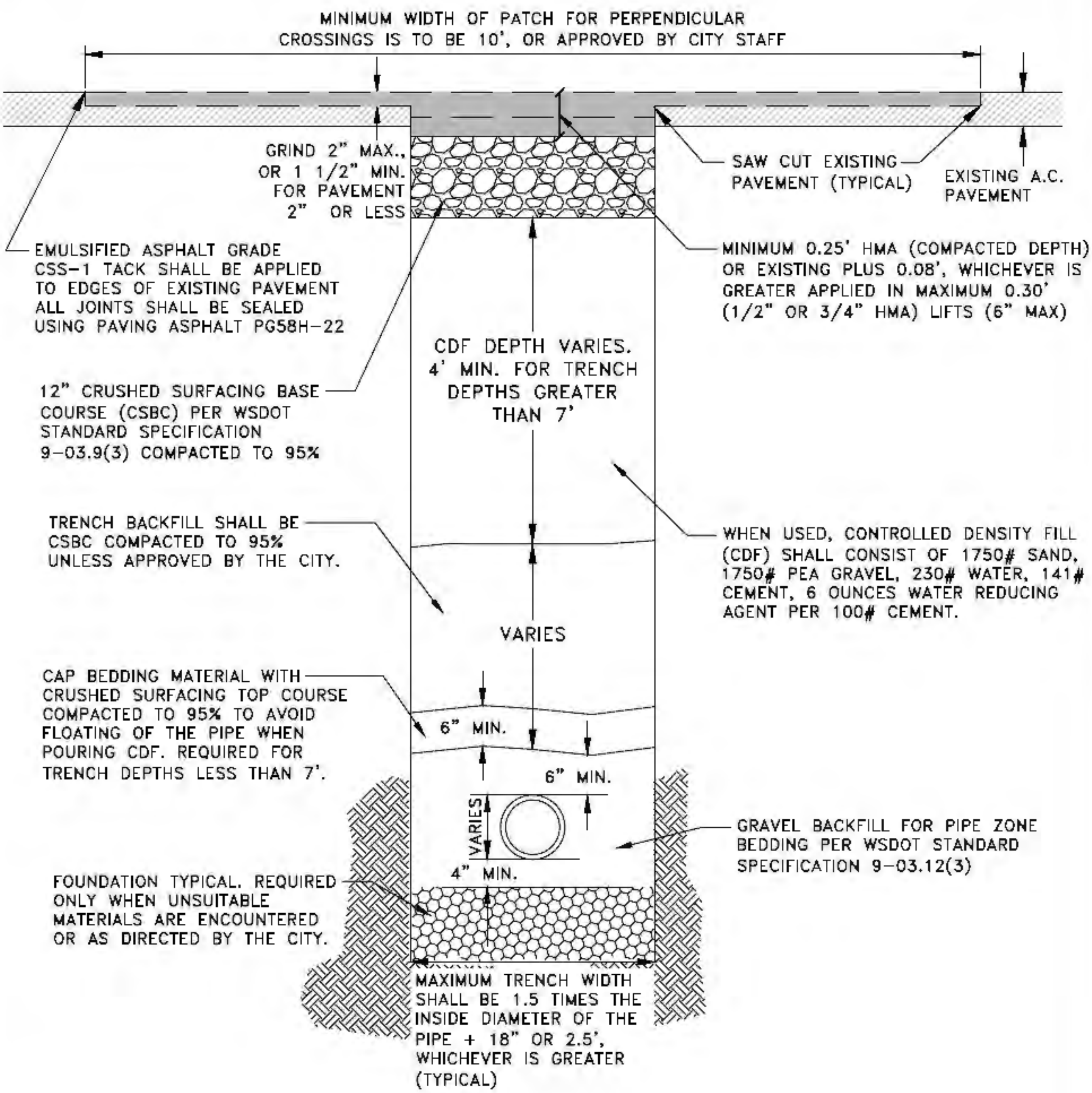
1. ALL MATERIALS EXCEPT H.M.A. SHALL BE COMPACTED IN 6-INCH MAXIMUM LIFTS TO 95% DENSITY AS DETERMINED BY ASTM D1557.
2. ALL MATERIALS, WORKMANSHIP, AND INSTALLATION SHALL BE IN CONFORMANCE WITH THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION AS AMENDED BY CITY OF TUMWATER STANDARDS.
3. KEEP TRENCH BOTTOM COMPACTED WITH UNIFORM GRADE. NO TEMPORARY SUPPORTS, I.E. BLOCKS, WILL BE ALLOWED TO SUPPORT PIPE. TRENCH BOTTOM SHALL BE TO GRADE PRIOR TO PIPE INSTALLATION.
4. SAW CUT PAVEMENT TO MAX. TRENCH WIDTH. BACKFILL AND PAVE TO TOP OF EXISTING PAVEMENT FOR TRENCH WIDTH. ALLOW 24 HOURS MINIMUM FOR TRENCH PATCH TO CURE. GRIND AND PAVE FINAL PATCH AS SHOWN.

CITY OF TUMWATER, WASHINGTON
TRANSPORTATION AND ENGINEERING DEPARTMENT

PARALLEL TRENCH RESTORATION
ARTERIALS, BLVDS. & COLLECTORS

APPROVED			DWG. NO.
ENGINEERING SERVICES MANAGER			ST 13
DES T.E.D.	DWN JN	CKD BH	DATE AUG 2020

ST-13.DWG



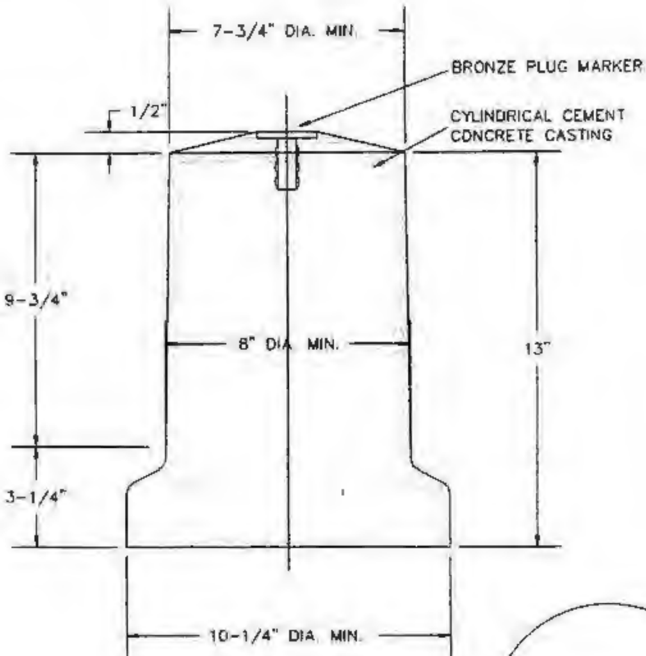
GENERAL NOTES:
1. ALL MATERIALS EXCEPT H.M.A. SHALL BE COMPACTED IN 6-INCH MAXIMUM LIFTS TO 95% DENSITY AS DETERMINED BY ASTM D1557.
2. ALL MATERIALS, WORKMANSHIP, AND INSTALLATION SHALL BE IN CONFORMANCE WITH THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION AS AMENDED BY CITY OF TUMWATER STANDARDS.
3. KEEP TRENCH BOTTOM COMPACTED WITH UNIFORM GRADE. NO TEMPORARY SUPPORTS, I.E. BLOCKS, WILL BE ALLOWED TO SUPPORT PIPE. TRENCH BOTTOM SHALL BE TO GRADE PRIOR TO PIPE INSTALLATION.
4. SAW CUT PAVEMENT TO MAX. TRENCH WIDTH. BACKFILL AND PAVE TO TOP OF EXISTING PAVEMENT FOR TRENCH WIDTH. ALLOW 24 HOURS MINIMUM FOR TRENCH PATCH TO CURE. GRIND AND PAVE FINAL PATCH AS SHOWN.

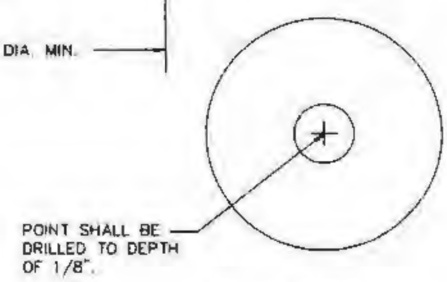
ST-14.DWG

CITY OF TUMWATER, WASHINGTON
TRANSPORTATION AND ENGINEERING DEPARTMENT

PERPENDICULAR TRENCH RESTORATION
ARTERIALS, BLVDS. & COLLECTORS

APPROVED			DWG. NO.
ENGINEERING SERVICES MANAGER			ST-14
DES	DWN	CKD	DATE
T.E.D.	JN	BH	AUG 2020



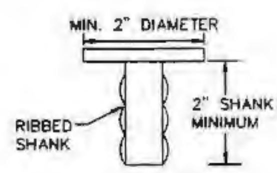


GENERAL NOTES:

MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE CASTING AT 28 DAYS – 3000#. MAXIMUM AGGRETE SIZE TO BE 1".

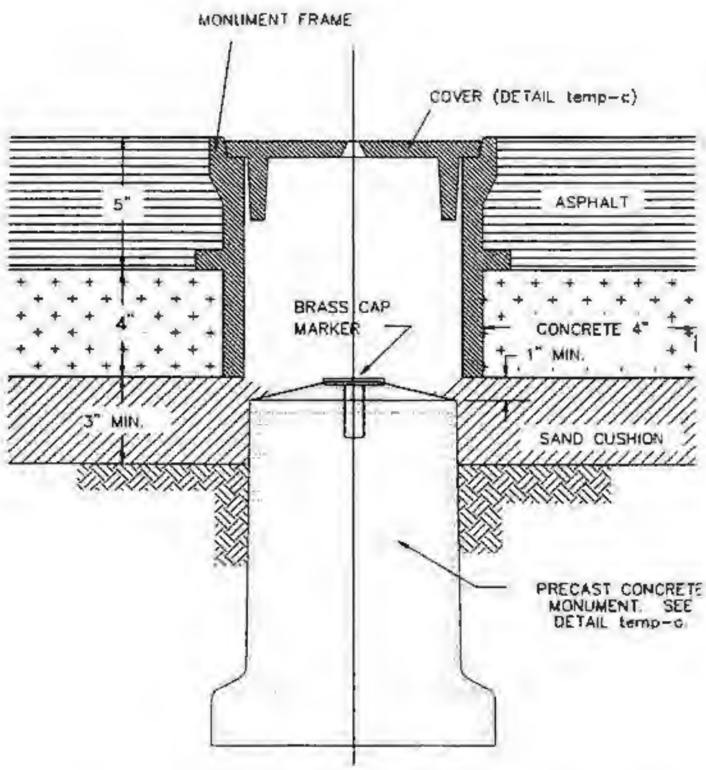
BRASS CAP MARKER 2" DIA. WITH MINIMUM 2" RIBBED SHANK.

THIS MONUMENT UTILIZED AT LOCATIONS DIRECTED BY CITY SURVEYOR.



BRASS CAP

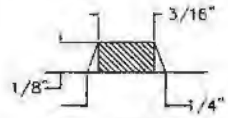
CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST–15
PRECAST CONCRETE MONUMENT	CHECKED BY: JRN	DATE: 03–30–95



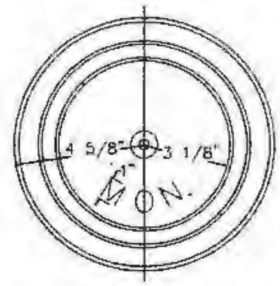
NOTES:

1. FOR USE ONLY WHEN DIRECTED BY THE CITY SURVEYOR.
2. MONUMENT POSITION SHALL BE ESTABLISHED BY A PROFESSIONAL LAND SURVEYOR LICENSED BY THE STATE OF WASHINGTON WHOSE CERTIFICATE NUMBER SHALL BE STAMPED ON BRASS CAP.
3. PRECAST CONCRETE MONUMENT TO BE PLACED ON FIRM AND UNYIELDING SOIL.

CITY OF TUMWATER MONUMENT CASE INSTALLATION (ALTERNATE DESIGN)	DRAWN BY: SRJ	STD. PLAN NO. ST-16
	CHECKED BY: JRN	DATE: 03-30-95



SECTION OF LETTER

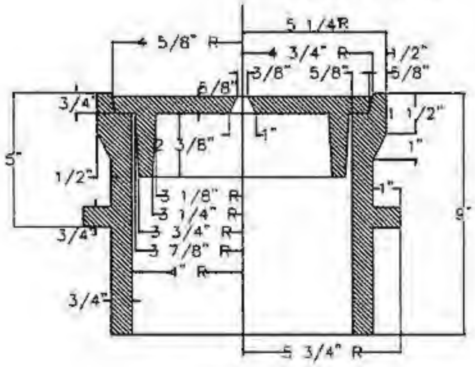


PLAN OF COVER

NOTES:
THE CASTINGS SHALL BE U.S.A. MADE GRAY-IRON CASTINGS, ASTM DESIGNATION A 48, CLASS 40. THE COVER AND SEAT SHALL BE MACHINED SO AS TO HAVE PERFECT CONTACT AROUND THE ENTIRE CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.

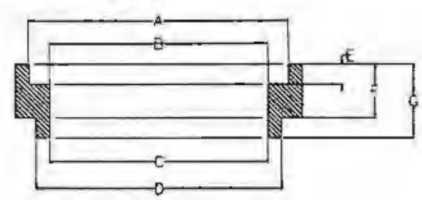
WHEN THE MONUMENT CASE AND COVER ARE PLACED IN CEMENT CONCRETE PAVEMENT THE CONCRETE BASE WILL BE NECESSARY.

APPROXIMATE WEIGHTS
CASE 60 LBS.
COVER 19 LBS.
TOTAL 79 LBS.



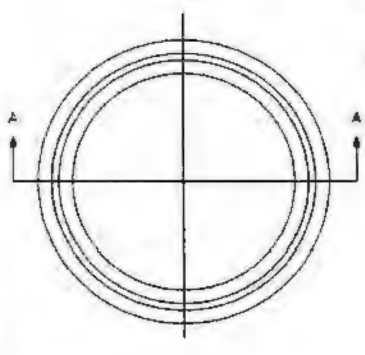
SECTION

SECTION A-A



PLAN

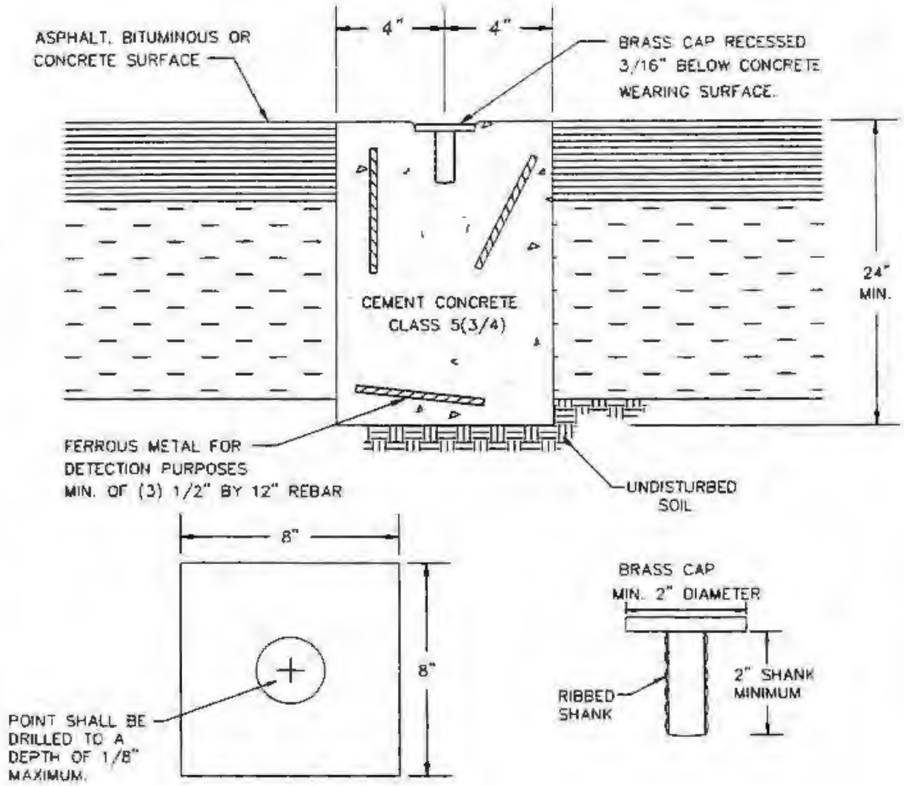
RISER RING



SIZE			
DIM	1-1/2"	2"	3"
A	10-1/2"	10-1/2"	10-1/2"
B	9-1/2"	9-1/2"	9-1/2"
C	8"	8"	8"
D	9"	9"	9"
E	3/4"	3/4"	3/4"
F	1-1/2"	2"	3"
G	2-1/4"	2-3/4"	3-3/4"

CITY OF TUMWATER
MONUMENT CASE AND
COVER WITH RISER

DRAWN BY: SRJ
CHECKED BY: JRN
STD. PLAN NO: ST-17
DATE: 03-30-95

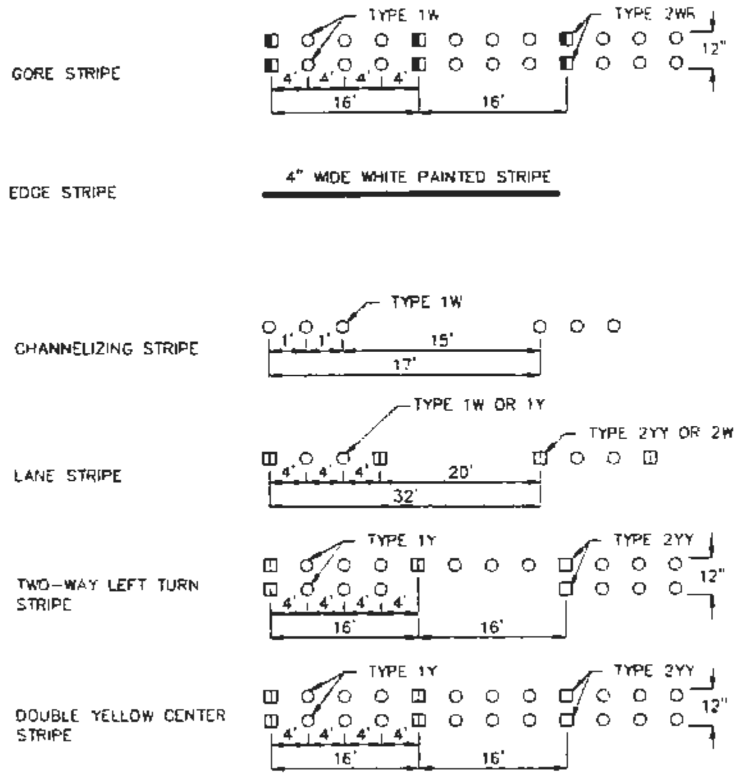


GENERAL NOTES:

1. THIS MONUMENT IS THE CITY'S STANDARD DESIGN AND SHALL BE USED IN ALL CASES UNLESS OTHERWISE DIRECTED BY THE CITY SURVEYOR.
2. CONCRETE BASE DIMENSIONS SHOWN ARE MINIMUM. CONCRETE BASE NOT FORMED.
3. CONCRETE TO BE PLACED ON A FIRM AND UNYIELDING FOUNDATION.
4. MONUMENT POSITIONS SHALL BE ESTABLISHED BY A PROFESSIONAL LAND SURVEYOR LICENSED BY THE STATE OF WASHINGTON WHOSE CERTIFICATE NUMBER SHALL BE PLACED ON CAP.

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-18
CAST IN PLACE MONUMENT (STANDARD DESIGN)	CHECKED BY: JRN	DATE: 04-27-95

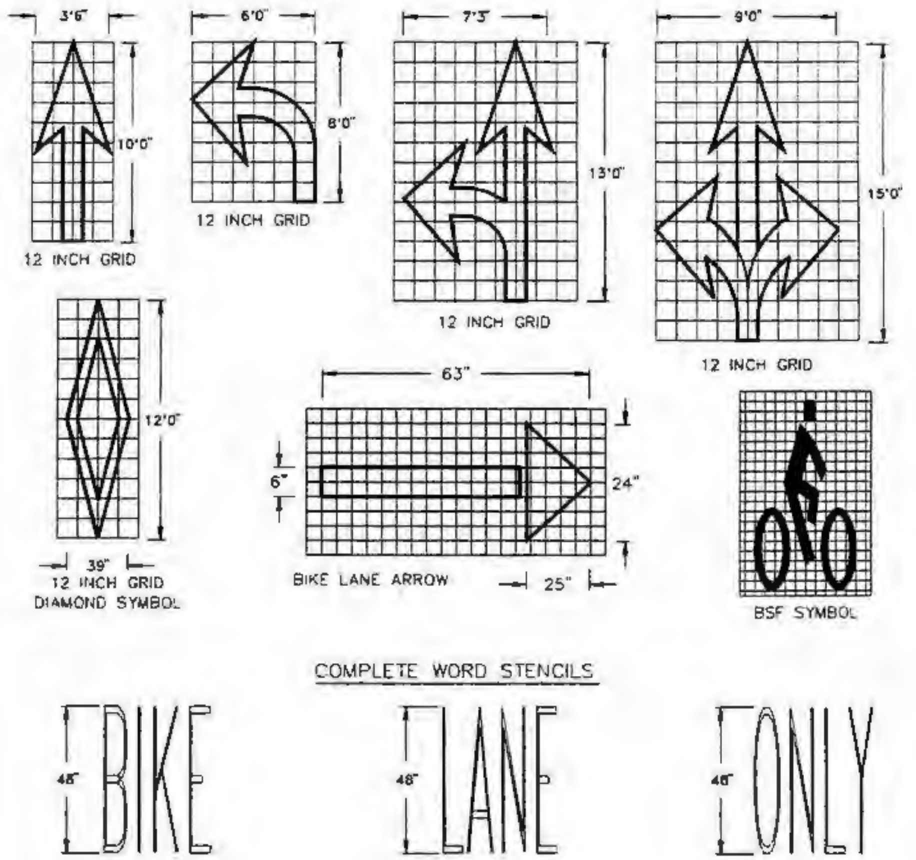
PAVEMENT MARKING DETAILS



LANE MARKERS

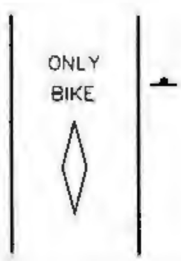
- TYPE 1W OR 1Y LANE MARKERS, WHITE OR YELLOW
- TYPE 2WR REFLECTIVE LANE MARKER, WHITE AND RED
- TYPE 2YY REFLECTIVE LANE MARKER, YELLOW AND YELLOW
- TYPE 2W REFLECTIVE LANE MARKER, WHITE-ONE SIDE ONLY

CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-19
STRIPING DETAIL	CHECKED BY: JRN	DATE: 4-05-95



GENERAL NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC OR METHACRYLIC RESIN.
2. ALL MARKINGS SHALL MEET FEDERAL METRIC STANDARDS.

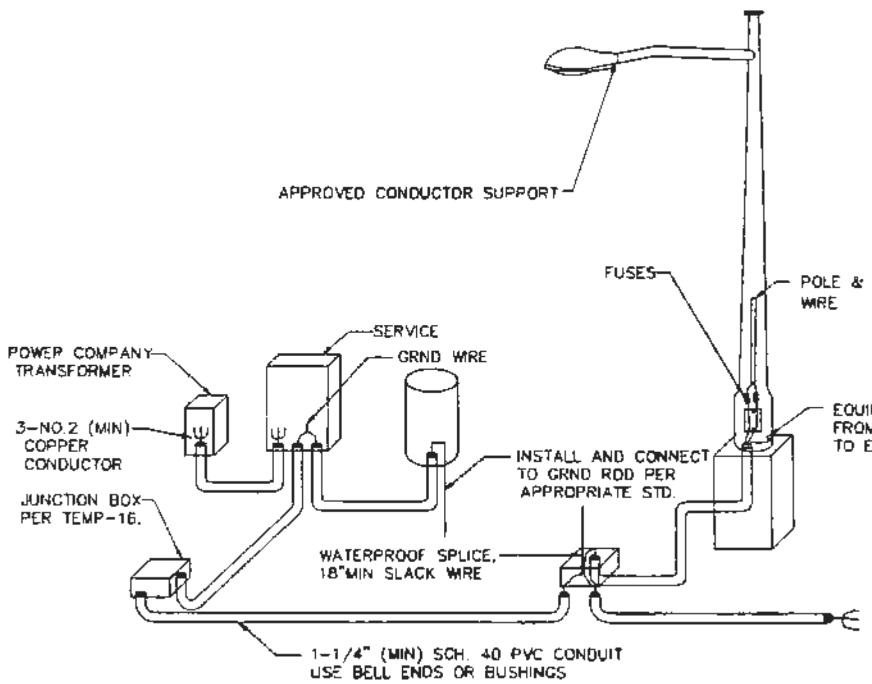


TYPICAL BIKE LANE STRIPING:

1. TO BE PLACED AT EACH INTERSECTION AND EVERY 1000 FT AND AT ALL PC'S.
2. BIKE LANE AHEAD AND BIKE LANE ENDS SIGNS SHALL ALSO BE PLACED IN ACCORDANCE WITH A MUTCD

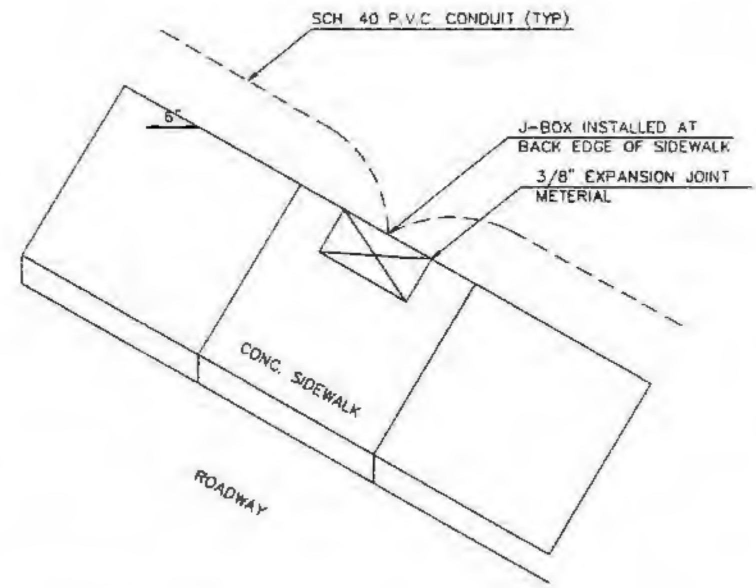
CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-20
PAVEMENT MARKINGS	CHECKED BY: JRN	DATE: 4-05-95

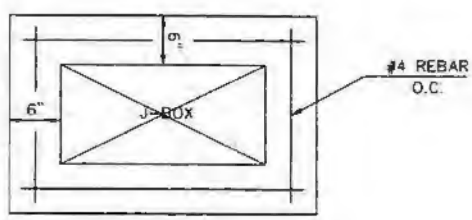
NOTE:
PHOTO CELL WINDOW SHALL FACE NORTH,
UNLESS DIRECTED BY THE ENGINEER



TYPICAL STREET LIGHT INSTALLATION
N.T.S.

CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-21
TYPICAL STREET LIGHT INSTALLATION	CHECKED BY: JRN	DATE: 4-05-95



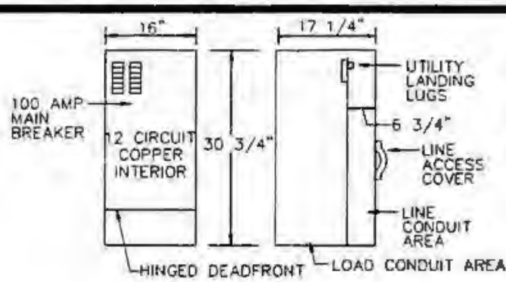


J-BOX PAD

NOTES:

1. WHERE NO SIDEWALKS EXIST A CONCRETE PAD SHALL BE CONSTRUCTED 6" THICK, 6" WIDE, COMPLETELY SURROUNDING J-BOX, WITH ONE #4 REBAR ON CENTER EACH SIDE AND TIED AT CORNERS.
2. J-BOX SHALL SET ON A 6" PAD OF CRUSHED SURFACING TOP COURSE OR WELL GRADED SAND.

CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-22
TYPICAL J-BOX LOCATION	CHECKED BY: JRN	DATE: 4-05-95



UNICORN CPIIIB-OII3A (NOT SHOWN)

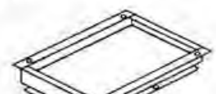
OR APPROVED EQUAL

SPECIFICATIONS

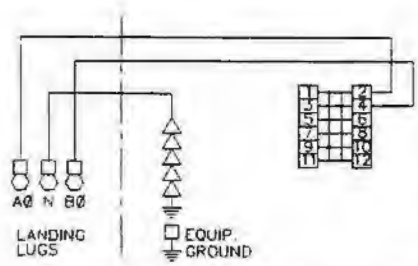
1. STANDARD VOLTAGE IS 120/240V; 100 AMP
2. CALTRANS TYPE 3B SERVICE OR U.L. APPROVED EQUAL.
3. TYPE 3R RAINPROOF ENCLOSURE
4. 12 GAUGE ZINC COATED STEEL CONSTRUCTION.
5. INTERIORS WILL ACCEPT PLUG-IN BREAKERS (BRYANT, G.E., WESTINGHOUSE, ITE, CROUSE-HINDS)
6. STANDARD FINISH: LIGHT GREEN BAKED ENAMEL OVER CORROSION RESISTANT ZINC CHROMATE PRIMER. EXCEEDS 250 HOURS SALT SPRAY ASTM B-117
7. DETACHABLE PADMOUNT SUB-BASE
8. COPPER BUSSED INTERIOR HAS PROVISIONS FOR TWELVE FULL ONE-INCH POLES.
9. SUITABLE FOR USE WITHOUT A MAIN WHEN NO MORE THAN SIX SERVICE DISCONNECTS ARE INSTALLED AND USED IN ACCORDANCE WITH ARTICLE 384 OF THE NEC.
10. SEAL SERVICE TO CONCRETE FOUNDATION WITH SILICONE

THE UNIT SHALL CONTAIN THE FOLLOWING ADDITIONAL EQUIPMENT:

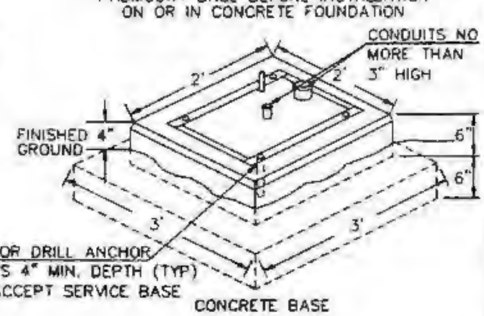
TWO MERCURY RELAYS (DPST)
ONE 3 POSITION TEST SWITCH
ONE PHOTOCELL



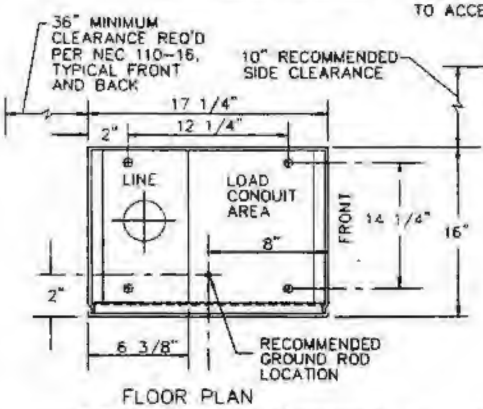
PADMOUNT BASE BEFORE INSTALLATION ON OR IN CONCRETE FOUNDATION



WIRING DIAGRAM

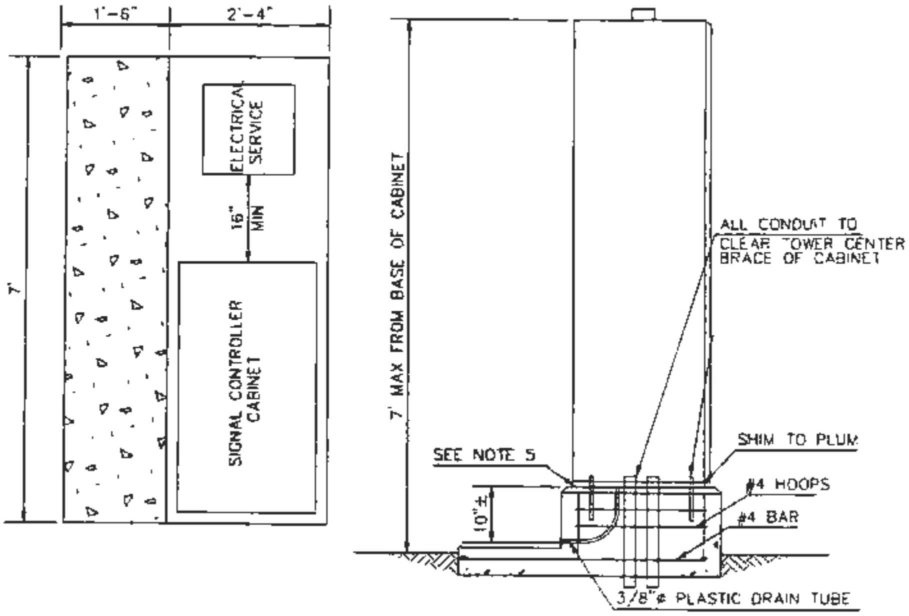


FOUNDATION



FLOOR PLAN

CITY OF TUMWATER SERVICE DISCONNECT FOR STREET LIGHTS & TRAFFIC SIGNALS	DRAWN BY: BDH	STD. PLAN NO. ST-23
	CHECKED BY: JRN	DATE: 4-05-95

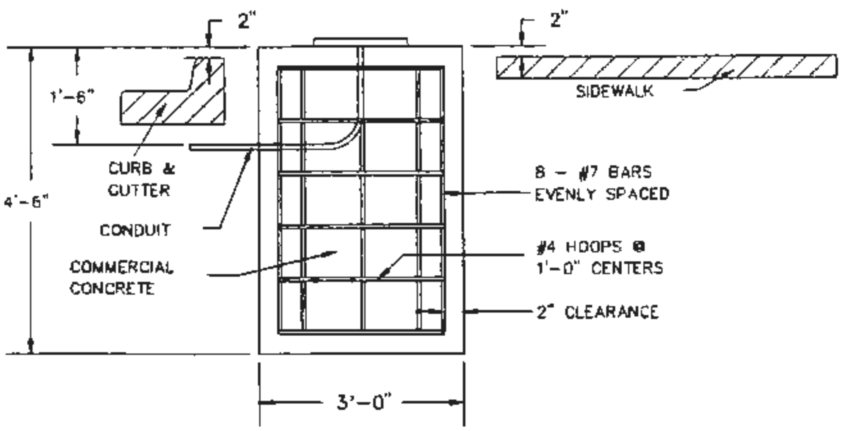


NOTES.
1. PAD AND PEDESTAL MOUNTS SHALL BE CLASS B CONCRETE UNLESS NOTED OTHERWISE ON PLANS
2. WHERE PAD OF PEDESTAL MOUNTS ARE LOCATED IN A SIDEWALK, CONSTRUCT MOUNT TOP FLUSH WITH SIDEWALK GRADE, OMITTING CHAMFER WHERE TOP AND SIDEWALK ABUT.
3. PAD MOUNT DESIGN IS TYPICAL: CONTRACTOR SHALL UTILIZE CABINET ON BASE WITH RESPECT TO CONDUIT PLACEMENT. CONTRACTOR SHALL SUBMIT FOR APPROVAL A PROPOSED DESIGN WITH PLAN, ELEVATION AND ANY RELEVANT SECTION VIEW.
4. CABINET SHALL BE ATTACHED WITH AASHTO M 164 CHEMICALLY BONDED ANCHOR TO EXISTING PAD MOUNTS. ANCHOR INSTALLATIONS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS IN DRY CONDITIONS.
5. PLACE A SILICONE SEAL BETWEEN THE CABINET FOUNDATION AND THE CABINET FOR THE PAD MOUNT DESIGN.
6. CABINET AND SERVICE TO BE CENTERED ON BASE.

DRAWING IS TYPICAL SEE NOTE #3 THE PURPOSE IS TO FIT THE CONTROLLER AND SERVICE ON ONE PAD WITH 16" SPACE BETWEEN

SEE APPROPRIATE DRAWING FOR ELECTRICAL SERVICE DISCONNECT SPECIFICATIONS

CITY OF TUMWATER SIGNAL CABINET/ ELEC. SERVICE FOUNDATION	DRAWN BY: BDH CHECKED BY: JRN	STD. PLAN NO. ST-24 DATE: 4-05-95



SQUARE OR ROUND

GENERAL NOTES:

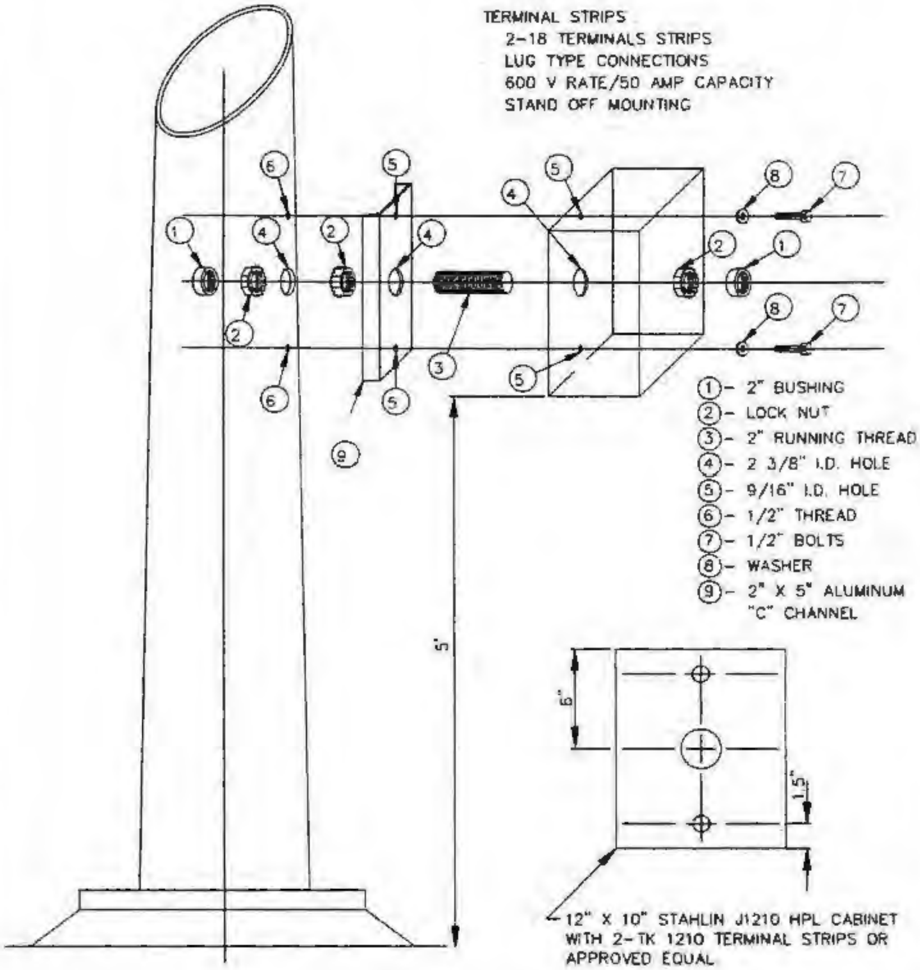
1. THE FOUNDATION IS DESIGNED FOR 2000 PSF AVERAGE SOIL LATERAL BEARING PRESSURE.
2. BOLT PATTERN PER MANUFACTURES SPECIFICATIONS
3. FOR DETAILS NOT SHOWN USE MANUFACTURES SPECIFICATIONS AND DETAILS.

CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-25
LUMINAIRE FOUNDATION	CHECKED BY: JRN	DATE: 4-10-95

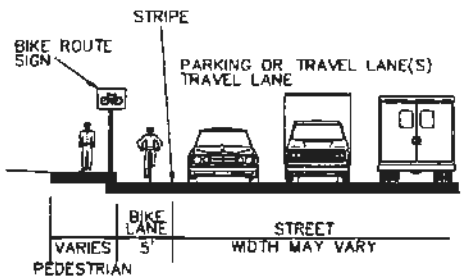
ENCLOSURE
MOLDED FIBERGLASS
NEMA 3-4X-12
12" X 10" X 4 7/8" INSIDE
STAINLESS STEEL PIANO HINGE
2-STAINLESS STEEL LATCHES
PADLOCK HASP

TERMINAL STRIPS
2-18 TERMINALS STRIPS
LUG TYPE CONNECTIONS
600 V RATE/50 AMP CAPACITY
STAND OFF MOUNTING

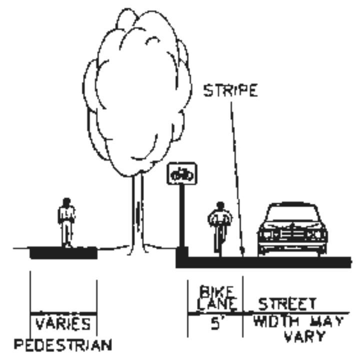
NOTE: SILICONE ALL ENTRANCE HOLES AT POLE AND CABINET



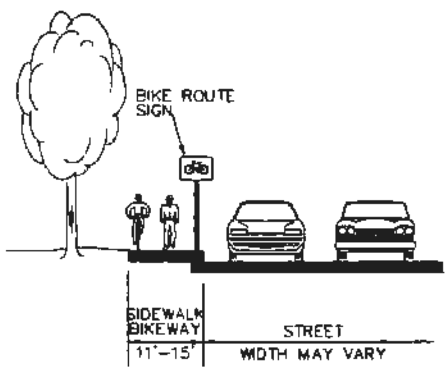
CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-26
TERMINAL CABINET INSTALLATION DETAIL	CHECKED BY: JRN	DATE: 4-10-95



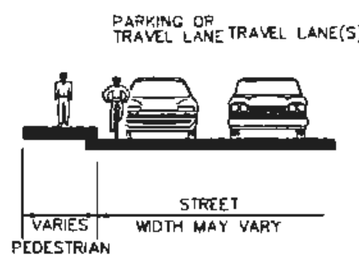
CLASS II BIKE PATH



CLASS II BIKE PATH
WITH PLANTER STRIP AND SIDEWALK

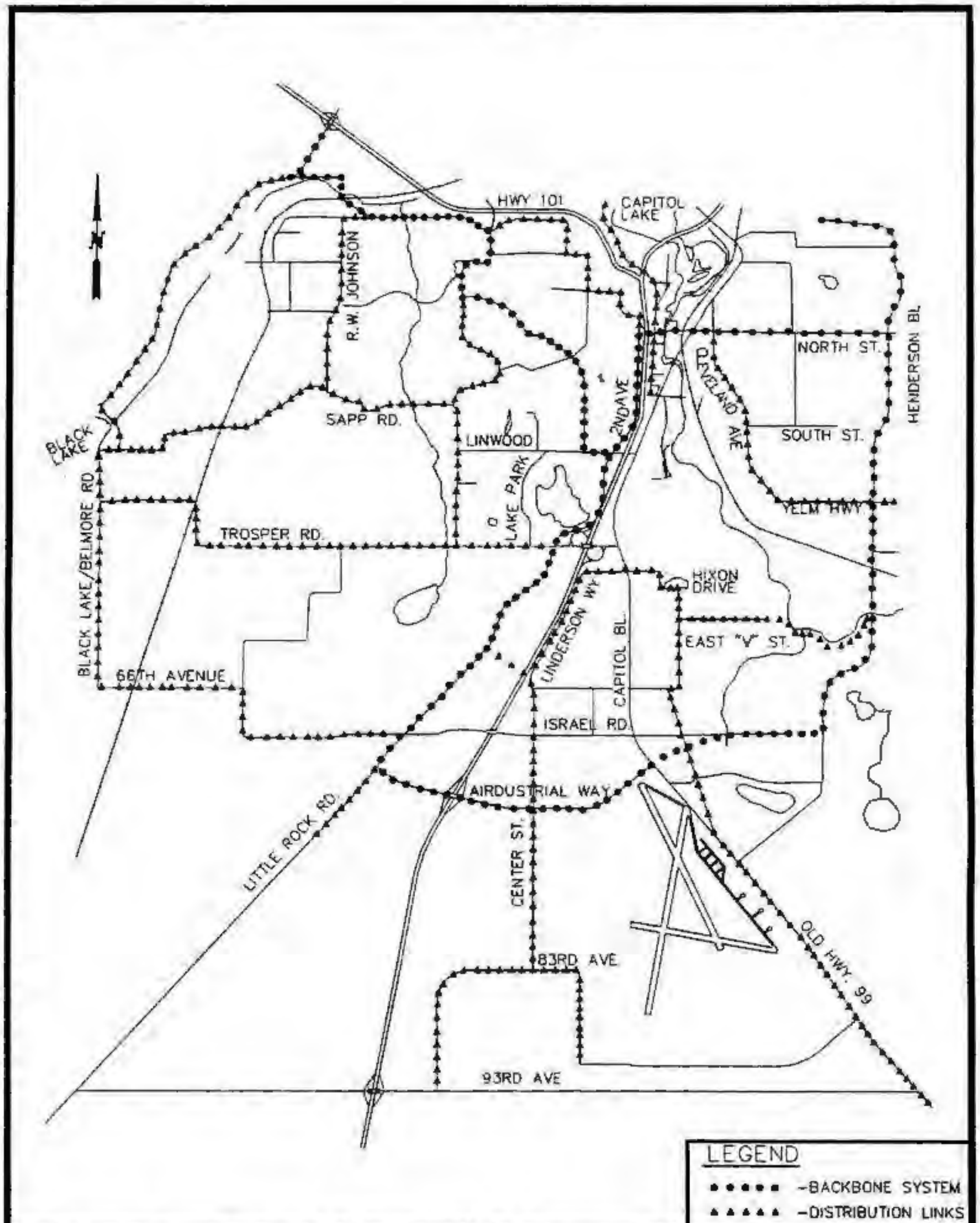


CLASS III BIKE ROUTE



CLASS IV SHARED ROADWAY

CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-27
BIKEWAY CLASSES	CHECKED BY: JRN	DATE: 4-05-95



CITY OF TUMWATER

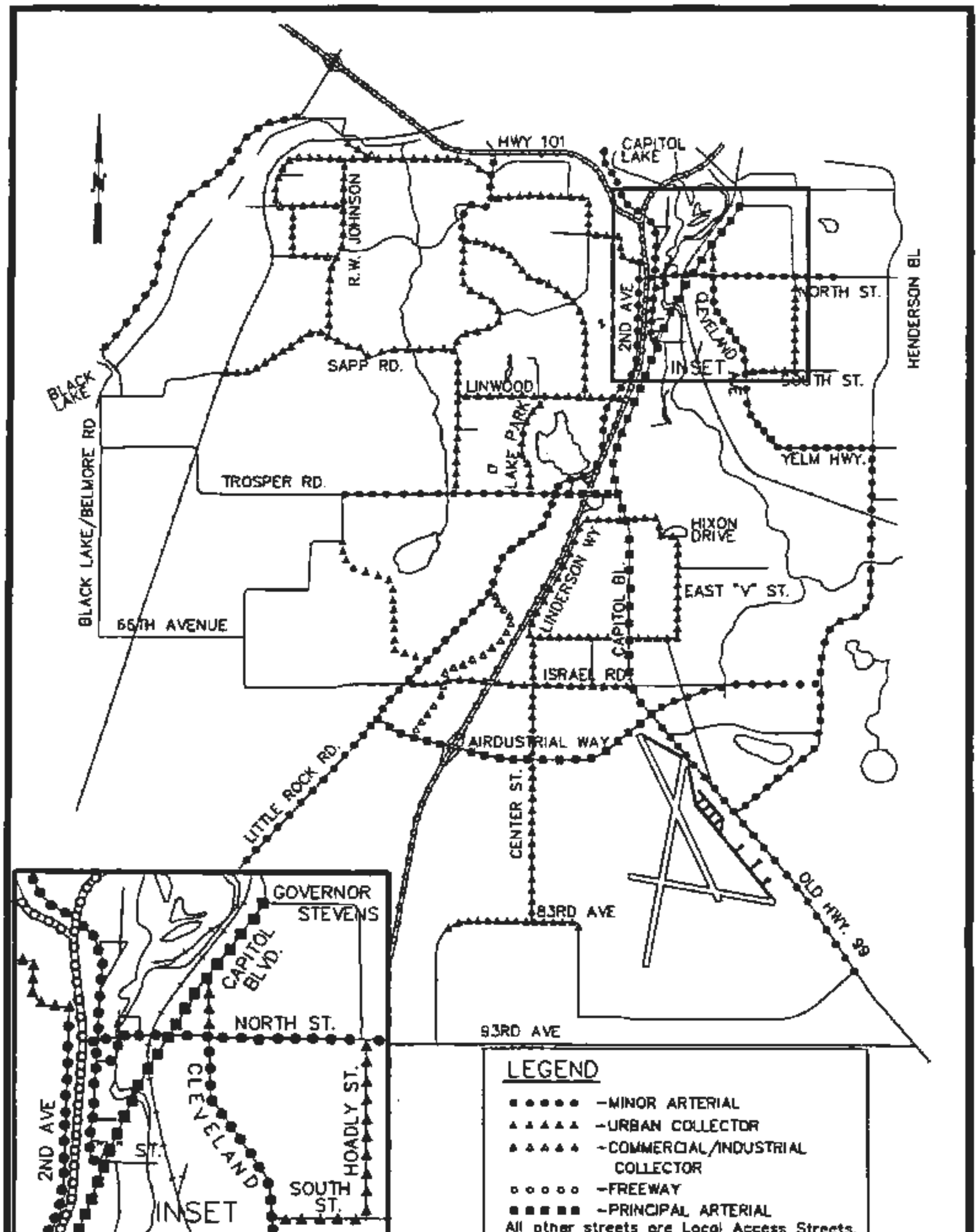
RECOMMENDED SYSTEM OF BICYCLE ROUTES

DRAWN BY: SRJ

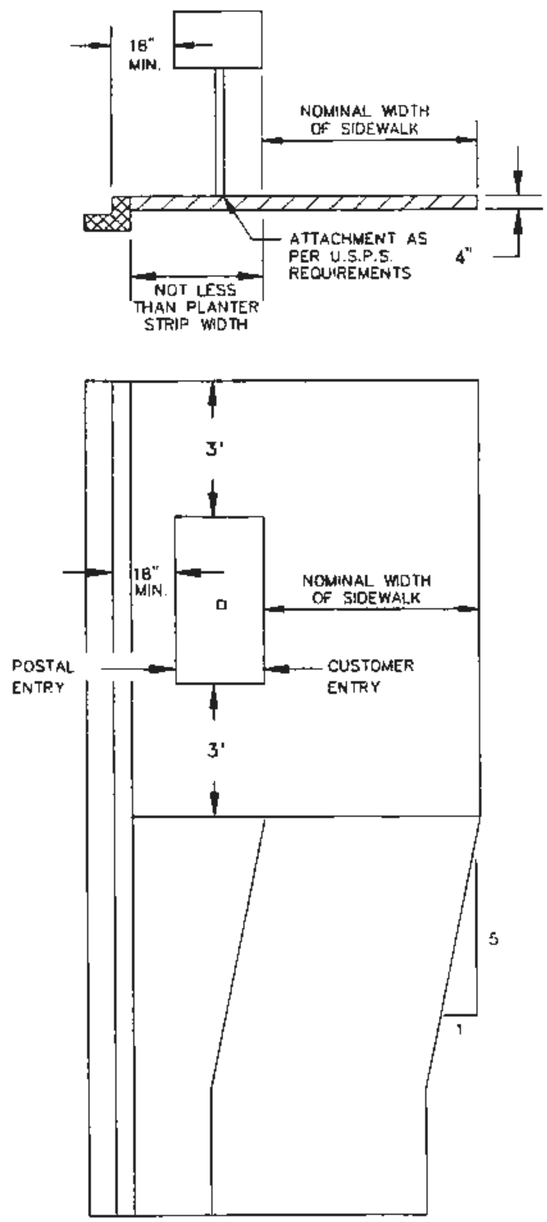
STD. PLAN NO. ST-28

CHECKED BY: JRN

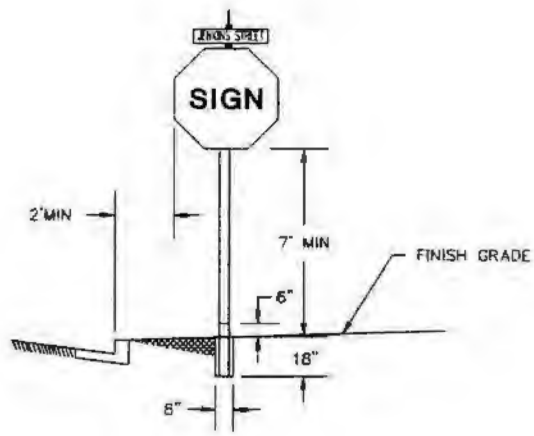
DATE: 04-18-95



CITY OF TUMWATER	DRAWN BY: BDH	STD. PLAN NO. ST-29
FUNCTIONAL CLASSIFICATION	CHECKED BY: JRN	DATE: 4-24-95



CITY OF TUMWATER	DRAWN BY: BDH	STD PLAN NO ST-30
MAIL BOX CLUSTER STYLE	CHECKED BY: JRN	DATE: 4-05-95



A. ALL SIGNS SHALL MEET REQUIREMENTS OF THE MUTCD, LATEST EDITION.

B. STREET NAME SIGNS SHALL HAVE A MINIMUM LENGTH OF 24". ALL SIGNS OVER 24" SHALL HAVE EXTRUDED BLADE. ALL UPPER CASE LETTERS 2" AND 4" WHITE REFLECTIVE ON A GREEN REFLECTIVE BACKGROUND.

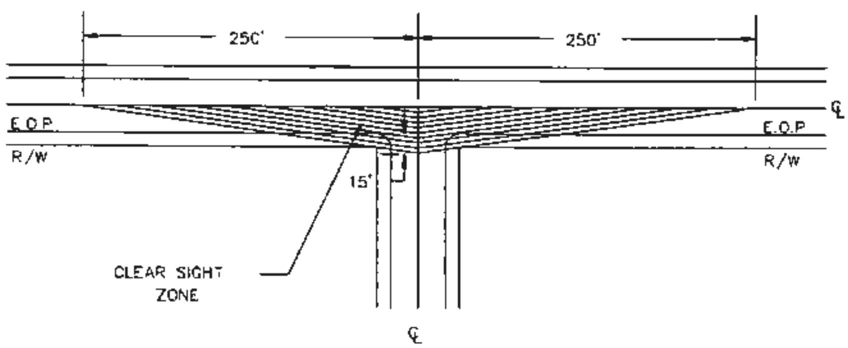
C. ALL POSTS SHALL BE 2" SQUARE, QWIK PUNCH WITH HOT DIPPED GALVANIZED FINISH, 10' LONG. BASE POST SHALL BE 2 1/4" SQUARE, QUICK PUNCH, HOT DIPPED GALVANIZED FINISH, 24" LONG. BASE POST SHALL BE CONSTRUCTED WITH 8" DIA x 18" LONG SONOTUBE FILLED FLUSH WITH CLASS 'B' CONCRETE. MATERIAL MAY BE ACQUIRED AT ZUMAR 6709 SOUTH ADAMS TACOMA, WA 98411. 1-800-426-7967, OR TRAFFIC SAFETY SUPPLY CO. 2324 S.E. UMATILLA ST. PORTLAND, OR 97202. 1-800-547-8518.

D. FASTENERS FOR STOP SIGN TO POST AND POST TO BASE POST MAY BE SCR 3/8" DRIVE RIVETS ACQUIRED AT ZUMAR OR TRAFFIC SAFETY SUPPLY CO. OR FASTENAL 715 78TH AVE. S.W. UNIT 'A' OLYMPIA, WA 98501. 352-7128 OR APPROVED EQUAL.

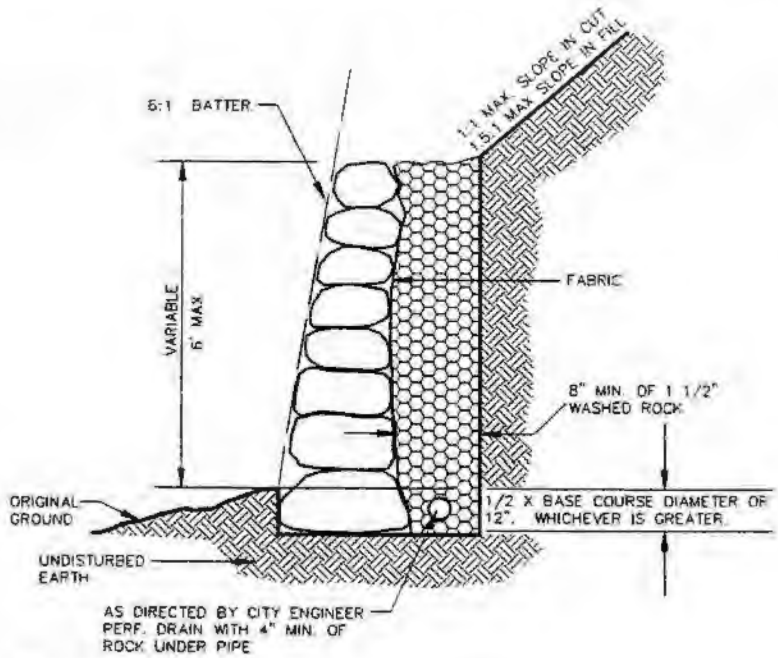
CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-32
SIGN POST	CHECKED BY: JRN	DATE: 05-30-95

STOP OR YIELD CONTROLLED INTERSECTIONS

EXAMPLE: MAJOR STREET SPEED LIMIT = 25 M.P.H.



CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO. ST-33
SIGHT OBSTRUCTION	CHECKED BY: JRN	DATE: 03-28-95



GENERAL NOTES:

1. ROCKERIED HIGHER THAN 5' SHALL BE CONSTRUCTED OF ROCKS OF GRADUATED SIZES FROM 5-MAN TO 2-MAN FROM BOTTOM TO TOP. ROCKERIES OF 5' OR LOWER SHALL BE CONSTRUCTED OF 3-MAN TO 2-MAN FROM BOTTOM TO TOP. ROCK SIZE CATAGORIES SHALL INCLUDE:
   - TWO-MAN ROCKS (300 TO 600 POUNDS), 13 INCHES IN LEAST DIMENSION
   - THREE-MAN ROCKS (800 TO 1200 POUNDS) 16 INCHES IN LEAST DIMENSION
   - FOUR-MAN ROCKS (1500 TO 2200 POUNDS) 18 INCHES IN LEAST DIMENSION
   - FIVE-MAN ROCKS (2400 TO 3400 POUNDS), 24 INCHES IN LEAST DIMENSION
2. THE ROCKERY SHALL BE INSTALLED WITH A SMOOTH FACE.
3. THE LONG DIMENSION OF THE ROCKS SHALL EXTEND INTO THE EARTH TO PROVIDE MAXIMYM STABILITY.
4. THE ROCK SHALL BE PLACED SO AS TO LOCK INTO TWO ROCKS IN THE LOWER TIER.
5. CALL FOR INSPECTION PRIOR TO BASE COURSE BEING PLACED (FOR VERIFICATION OF ROCKERY HEIGHT, FOUNDATION MATERIAL AND ROCK SIZE).
6. DESIGN VARYING FROM THOSE INDICATED SHALL CARRY THE SEAL OF A CIVIL ENGINEER EXPERIENCED IN SOIL MECHANICS.

CITY OF TUMWATER	DRAWN BY: SRJ	STD. PLAN NO: ST-34
ROCK RETAINING WALL 6' HIGH OR LESS	CHECKED BY: AOB	DATE: 10-30-95