

City of Tacoma Public Works Department Design Manual



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Preface

This design manual shall apply to the construction of all street and right-of-way improvements, storm mainline extensions, and sanitary mainline extensions (in conjunction with all associated appurtenances) to the City of Tacoma infrastructure. This manual is designed to be utilized in concert with all referenced documents in the appendices.

The City of Tacoma has developed this design manual to set forth specific design criteria for private developers and other private parties construction or modifying street or right-of-way facilities including sanitary main or storm main extensions as well as private access ways. In addition, this design manual will establish uniform criteria to guide the City's own design and construction of new or reconstructed City streets and facilities.

This design manual should be used by the design engineer as a tool prior to submitting plans for review. It is the hope of the City that the amount of review required to achieve an acceptable set of construction plans and specifications will be reduced with the aid of this manual. This should reduce the overall plan review time and allow construction to start at an earlier date; saving time and money for the developer, the engineer, the City of Tacoma, and ultimately the public. This manual should be considered a "living document" and is subject to updates and revisions.

The manual is generally divided into the following sections:

- Chapter 1: Introductions and General Requirements
- Chapter 2: The Work Order Process
- Chapter 3: The Work Order Plan Format
- Chapter 4: Street Design
- Chapter 5: Sanitary and Stormwater Design
- Chapter 6: Streetlighting
- Chapter 7: Traffic Signalization
- Chapter 8: Channelization / Pavement Markings
- Chapter 9: Miscellaneous Topics

- Appendix A: Public Works Standard Plans
- Appendix B: Work Order Checklist
- Appendix C: Misc. written policies pertaining to work orders / construction
- Appendix D: Uniform Building Code, Amendments re: Erosion Control
- Appendix E: Driveway Control Ordinance
- Appendix F: Bond Estimate Worksheet
- Appendix G: References
- Appendix H: Work Order Sample Plan

Chapter 1

Introduction and General Requirements

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1.010 General

This design manual has been developed to provide the design engineer with the minimum criteria for developing stand alone plans for the construction of required improvements, and is not intended to be all inclusive. The criteria outlined in this manual will assist the engineer in the design of most situations.

The quality and economic viability of the finished product will greatly depend upon the creativity and ingenuity of the engineer. Deviations from this manual will be judged by the City of Tacoma on the likelihood that such a variance will provide a comparable result. Sound evidence, consistent with good engineering practice, which supports an alternate design to a City of Tacoma standard, must be provided for consideration.

These City of Tacoma Public Works guidelines and standards shall be referred to routinely in the text as the "Design Manual".

1.020 Plans, References, and Specifications

A. References

References and portions of text from documents, ordinances, standards, and codes have been provided for convenience based on the current publication of each reference. All references contained herein shall be superseded by the latest adopted or published respective reference.

B. Standard Specifications

The standard specifications as referenced herein shall be the most recent edition of the "Standard Specifications for Road, Bridge, and Municipal Construction" as prepared by the Washington State Department of Transportation (WSDOT) and supplemented by the Washington State Chapter of American Public Works Association (APWA); as superseded by the Amendments to the Standard Specifications and APWA Supplement; as superseded by general and site specific notes identified on the approved set of plans. State Standard Specifications are available through WSDOT, by mail at Engineering Publications, PO Box 47408, Olympia, WA 98504-7408, or by phoning (360) 705-7430.

C. Standard Plans

The standard plans as referenced herein shall be the most recent edition of the "Standard Plans for Road, Bridge, and Municipal Construction" as prepared by the Washington State Department of Transportation (WSDOT) and the Washington State Chapter of American Public Works Association (APWA), and the most recent edition of the City of Tacoma Public Works Department Standard Plans. In instances where the City of Tacoma Public Works Department Standard Plans and the WSDOT/APWA Standard Plans are in conflict, the City of Tacoma Public Works Department Standard Plans supersedes. Plans and details shown on an approved set of plans supersede the State and City standard plans.

City of Tacoma Public Works Department Standard Plans are available online at <http://www.govme.org/> or at the Information Center at 747 Market Street, Room 332, Tacoma, WA 98402-3769. See Appendix 'A' for hard copies of the City of Tacoma Public Works Department Standard Plans. WSDOT/APWA Standard Plans are available through WSDOT, by mail at Engineering Publications, PO Box 47408, Olympia, WA 98504-7408, or by phoning (360) 705-7430, or on the internet at: <http://www.wsdot.wa.gov/eesc/design/designstandards/>

D. Improvement Plans

Prior to the initiation of construction of a public roadway within the public right-of-way, or the extension of any public utility, the developer shall submit a complete set of plans prepared by a professional engineer licensed in the State of Washington, to the Tacoma Public Works Department. Plans for the construction of streets, utilities, and other facilities to be owned and maintained by the City of Tacoma shall be in conformance with Chapters 4 and 5 and in acceptable plan format as outlined in Chapter 3.

1.030 Development Conditions/Requirements

A. Authority

Street improvements, curb and gutter, sidewalk, and drainage for new developments are required according to the City of Tacoma Amendments to the 2003 International Building Code (as provided in section 2.02.090 of the Tacoma Municipal Code) and the site-specific development conditions. The 2003 International Fire Code dictates minimum access to properties. The Generalized Land Use Plan, adopted under Ordinance No. 25360 requires the extension of sanitary sewers and other utilities in conjunction with all new development.

B. The City of Tacoma Public Works Review Panel

The City of Tacoma Public Works Review Panel is comprised of representatives from various divisions within the Public Works Department. The Review Panel meets regularly to discuss required off-site improvements for the development of a site based on the City's ordinances and policies. The Review Panel provides the basis for a recommendation to the Hearing Examiner or Land Use Administrator regarding the required improvements.

Interested parties may obtain the requirements for developing a site prior to purchasing the property or applying for a building permit. For a fee established by the Building and Land Use Services Division, the applicant may apply to have the site reviewed by the Review Panel for a written set of development conditions. Application may be obtained through the Building and Land Use Services, Permit Counter. The application must include a site plan and a detailed description of the project.

C. Public Works Development Conditions

The off-site improvements, for developments that do not require land use action, are established by ordinance as stated in 1.030.A. For developments that require land use action (rezone, plat, special use permit, etc.), the Public Works Department identifies required improvements based upon established ordinances and policies. In addition, the Public Works Department recommends development conditions to mitigate impacts generated by the proposed development.

All required conditions of approval must be complete or bonded for, with date certain completion, prior to final plat approval or the obtaining of a certificate of occupancy.

D. Amendments to the 2003 International Building Code

The following is an excerpt from Section 2.02.120 of the City of Tacoma amendments to the 2003 International Building Code

Sec. 117. Off-Site Improvements. All new building construction, all new site uses, change of uses, all moved buildings moved onto a site from off-site, and all alterations or additions to buildings presently existing on the building site, except Group R, Division 3 and Group U occupancies, with a cost greater than 50 percent of evaluation of the existing building shall comply with the following regulations. The evaluation of the existing building shall be determined from the latest available Building Evaluation Table as published by the International Conference of Building Officials in its Building Standards Magazine. The evaluation table will be applied to the floor area of the existing building for the existing occupancy as if it were new construction.

For the purposes of this section the following definitions shall apply:

ALL NEW CONSTRUCTION shall mean: new buildings, new site uses or changes of use, and moved buildings.

BUILDING SITE shall be a platted or unplatted parcel of land unified as a single property for the purpose of constructing a single building or a group of buildings being constructed as a unified project.

LOT FRONTAGE is the length of a building site abutting one or more dedicated city streets, whether improved or unimproved.

PUBLIC WAY is any street, alley or similar parcel of land essentially unobstructed from the ground to the sky which is deeded, dedicated or otherwise permanently appropriated to the public for public use and having a clear width of not less than 10 feet (3048 mm).

STREET FRONTAGE is the abutment of privately owned property along one side of a dedicated street between the intersections of dedicated streets, alleys or other public ways.

117.1. Access to all new construction, and all newly established access to existing buildings and sites within the City of Tacoma, shall be so graded that the finished driveway grade does not exceed a 15 percent slope, unless a design is approved by the City Engineer. Driveway approaches shall be in accordance with chapter 10.14 of the Tacoma Municipal Code (Driveway Ordinance). Changes of driveway grade shall be gradual, such that no vehicle clearances are reduced to a point where the vehicle comes in contact with the surface of the driveway. Vehicles in this case shall mean commercially-produced unmodified vehicles which might normally use the driveway, including emergency vehicles where applicable. Grades shall be established using the property side of the sidewalk alignment.

117.2. All new construction other than Group R, Division 3, occupancies, shall install street improvements to minimum Public Works Department Standards and constructed in accordance with the Public Works Department Design Manual for the location, including, but not limited to, street paving, concrete curbs and gutters, storm drainage, utility relocation, and sidewalks on all lot frontages facing on dedicated street rights-of-way. When a lot adjoins an alley or street

intersection, improvements shall also be installed at the alley or street intersection. Alleys shall be improved to City of Tacoma standards when any access to the site is provided from the alley. New construction including Group R, Division 3 occupancies, but excluding Group U occupancies, which have existing improvements such as sidewalks, curbs, gutters, and paving, shall replace said improvements that are broken, damaged or hazardous. Pavement shall also be required to be replaced when it does not meet the current standard pavement section for residential or arterial streets contained in the Public Works Design Manual.

117.3. Construction of Group R, Division 3, occupancies shall require the development of cement concrete curb and gutter, paving, and drainage of all dedicated streets along the lot frontages, except, in cases where the topography or other conditions make it impractical, the Building Official may modify this street regulation. Such development of cement concrete curb and gutter, paving, and drainage shall be to minimum Public Works Department Standards and constructed in accordance with the Public Works Department Design Manual for the location. Drainage shall meet minimum Public Works Department Standards. The same criteria used for determining the placement of sidewalks for Group R, Division 3, Occupancies, set forth in Section 117.4, shall be used to determine placement of cement concrete curb and gutter and associated paving.

Sec. 117.4. All Group R, Division 3, Occupancies shall install City of Tacoma approved standard sidewalks when any of the following criteria applies:

117.4.1. Sidewalks exist on the site, or sites, adjacent to the site to be built on, or

117.4.2. Sidewalks exist on the majority of the developed sites in the area, or

117.4.3. There is sufficient undeveloped property in the street frontages on both sides of the street that, when developed either by itself or when added to lot frontages already containing sidewalks, the majority of the street frontages on both sides of the street will have sidewalks, or

117.4.4. The development involves more than one site and warrants sidewalks as part of the overall development.

117.5. All new building construction all new site uses, change of uses, all moved buildings moved onto a site from off-site, and all alterations or additions to buildings presently existing on the building site, except Group R, Division 3 and Group U occupancies, with a cost greater than 50 percent of evaluation of the existing building (as defined at beginning of this section.) shall provide for surface and subsurface drainage to the satisfaction of the Building Official. Drainage shall meet minimum Public Works Department Standards. Satisfactory surface drainage shall include, but not be limited to:

117.5.1. Conveying all site drainage to the street gutter or storm sewer. Connection to the City storm sewer shall be at a storm sewer structure, unless otherwise approved by the Building Official.

117.5.2. Conveying all site drainage to an approved engineered infiltration system. Infiltration systems are only allowed when City storm sewers are not available. Infiltration systems shall be designed per Public Works Department standards.

117.5.3. Conveying all site drainage to an existing acceptable drainage course. The City of Tacoma requires prior approval to direct site drainage to drainage courses.

Sec. 117.6. The City Engineer or designated representative may waive or modify the requirements of Section 117 where it is determined to be not practical or in the best interests of the City of Tacoma.

E. Requirements for Plats

Samples of some of the requirements associated with developing new plats are as follows:

- Concrete curb, gutter and sidewalk on all adjacent street frontages (asphalt wedge curb elsewhere).
- Pavement section consistent with City Standards.
- Grading, Filling, and Erosion Control.
- Storm/Sanitary Extensions to serve all lots.
- Private storm drainage.
- Streetlighting.

F. Requirements for Short Plats/Private Accessways

The following table represents the minimum street section requirements for short plats and private accessways based on the number of lots being developed. However, this table does not apply to all situations.

	Greater than 4 Lots	3 to 4 Lots	2 Lots
Designation	Public Street right-of-way or Private Street Easement	Private Accessway Easement	Private Accessway Easement
Right-of-way or Easement width	52 Feet ^(1,2)	30 Feet	20 Feet
Pavement Width	28 Feet	24 Feet	16 Feet with additional 4 feet graded and graveled surface to meet International Fire Code
Pavement Section (Residential)	3" Hot Mix Asphalt (HMA), Cl. ½", PG 58-22 2½" C.S.T.C. 5" C.S.B.C.	3" HMA, Cl. ½", PG 58-22 2½" C.S.T.C. 5" C.S.B.C	3" HMA, Cl. ½", PG 58-22 2½" C.S.T.C. 5" C.S.B.C
Cement Concrete Driveway	Required at entrance to all lots ³	Required at entrance to private access way ³	Required at entrance to private access way ³
Sidewalk	Concrete walk Required for both sides.	Not Required	Not Required
Concrete Curb/Gutter	Both Sides	Not Required	Not Required
Asphalt Wedge Curb	N/A	Required	Required

¹ May be reduced to 41 feet for private roadways, with approval from the City Engineer.

² May be reduced to 20 feet for private roadways in high density zoning districts, with approval from the City Engineer.

³ A temporary asphalt driveway approach is required when no concrete curb and gutter exists on the City street. A cement concrete driveway approach is not allowed unless concrete curb and gutter is either present, or will be installed with the driveway approach.

Conditions of Approval of the Final Plat

The following is an excerpt from the Tacoma Municipal Code regarding the conditions of approval of the final plat. (Ref: TMC 13.04.100(J))

J. Conditions of Approval of the Final Plat.

Before approval of the final plat of a subdivision, the Land Use Administrator will require:

1. That all street grading and grading along street lines, including sidewalk areas and bus stop areas, be approved by the City Engineer to ensure proper transition from street grade to adjacent property.
2. Surfacing of all roadways, bike routes, and pedestrian ways with an all-weather surface approved by the City Engineer; this shall include the construction of curbs and gutters of Portland cement concrete in accordance with the specifications of the City of Tacoma.
3. Installation of necessary facilities for the proper handling of storm drainage as approved by the City Engineer.
4. Installation of necessary facilities for the disposal of sanitary wastes as approved by the City Engineer.
5. Installation of necessary water supply systems, including fire hydrants, as approved by the Department of Public Utilities.
6. Installation of the necessary electrical power facilities as approved by the Department of Public Utilities.
 - a. As a condition of the final plat, the Land Use Administrator shall require the petitioner or developer to install underground all public utility services such as electric, telephone and CATV facilities, whether in streets, alleys, on public easements, or on private properties.
 - b. The Land Use Administrator may, however, if the facts and circumstances in respect to some particular development in a proposed plat so warrant, authorize a waiver or modification from the general requirement hereinabove set forth, but, in such cases, shall give the reasons and conditions therefor.
7. The Land Use Administrator may also require the petitioner or developer, as a condition of approval of the final plat, to install or construct certain improvements on existing rights-of-way abutting the plat which are deemed necessary to control and expedite the movement of bicycles, automobiles, buses, and other vehicular and/or pedestrian traffic which would be generated by the development of the subdivision.
8. In lieu of the construction of the required improvements before approval of the final plat of a subdivision by the Land Use Administrator, the subdivider shall post a performance bond, or cash deposit in lieu thereof, with the Public Works Department in an amount not less than the City Engineer's estimate of the cost of the required improvements, and provide security satisfactory to the Department of Public Works, guaranteeing that the required improvements shall be completed in accordance with the requirements of the City of Tacoma and within the specified period of time. The cash deposit, bond, or other security, as hereinabove required, may also secure the successful operation of required improvements for a two-year period after final approval.

All required improvements shall be completed by the subdivider within one year from the date of the approval of the final plat by the Land Use Administrator unless waived by the department, or departments, requiring such improvements. If said required improvements are not completed in the specified time, or the required improvements do not operate successfully for two years after completion, the City may use the applicable bonds or other security, or any portion thereof, to complete the same, correct any deficiencies in, or make any repairs to, constructed improvements which fail to successfully operate for two years after completion and final approval. After approval of the final plat by the Land Use Administrator and recording by the County Auditor of Pierce County, the subdivider may petition for, and have established by the City Council, a local improvement district in accordance with the state statutes and ordinances of the City of Tacoma to cover the cost of all required improvements not previously constructed. The Public Works Department and/or Public Utilities Department may authorize cancellation of the previously posted performance bond or security, or a portion thereof, for installation of the required improvements after final establishment of a local improvement district by the City Council and the execution of a contract therefor.

9. A house numbering system.

10. Sidewalks shall be required along all lot frontages within a subdivision as a condition of the building permit for the development of each lot within a subdivision. The required sidewalk(s) along a lot frontage(s) shall be constructed prior to the final inspection for any structure constructed upon such lot as provided for in Ordinance No. 19486 of the City of Tacoma or, in lieu of actual construction of required sidewalks, a performance bond or cash deposit shall be posted with the Department of Public Works ensuring that said sidewalks shall be constructed within a period of one year.

If required as a condition of the preliminary plat, sidewalks abutting private, common or public open spaces within a subdivision shall be constructed in conjunction with the construction of the streets within the subdivision and, in lieu of actual construction, surety guaranteeing their installation shall be provided in accordance with the provisions contained in paragraph 8 of this subsection.

1.040 Definitions

- A. “Arterial Street Section” – Refer to Section 4.040.D of this manual.
- B. “Record Drawings” –project drawings showing all data concerning the actual in-place locations of all construction items, including any items that differ from what was shown in the original drawings. Record drawings for work order plans shall conform to the record drawings criteria as defined on the approved work order plans.
- C. “Certificate of Occupancy” – document issued by the Building and Land Use Services Division certifying that all or a designated portion of a building complies with all applicable conditions and regulations, and permits occupancy of the building for its designated use.
- D. “City” – the City of Tacoma.
- E. “City Engineer” – the Tacoma City Engineer or his duly authorized representative.
- F. “Clearing” – the removal and disposal of all unwanted material from the surface, such as trees, brush, downed timber, or other natural material.

- G. “Common Utility Trench” – a joint trench located in the planting strip or behind the sidewalk, which is reserved for Tacoma Power power cable, streetlighting conduit, telephone cable, cable television cable, and gas lines. Refer to Public Works Standard Plan No. DR-04/DR-05 located in Appendix A.
- H. “Contractor” – a contractor licensed and bonded in the State of Washington.
- I. “Cul-de-sac” – a residential street characterized by a single ingress and egress.
- J. “Curb Ramp” – an acceptable access ramp for the transition from the sidewalk to the street surface conforming to the current ADA standards.
- K. “Development Conditions” – the requirements for development of a site set forth by the Hearing Examiner, the City Engineer, the Land Use Administrator, or the City of Tacoma Public Works Department Review Panel.
- L. “Director” – The City of Tacoma Director of Public Works or his duly authorized representative/agent.
- M. “Easement, Private” – an easement recorded by the Pierce County Auditor, designated for the use of private utilities, private access, etc. created for the rights of specific private property owners or neighborhood associations.
- N. “Easement, Public” – an easement recorded by the Pierce County Auditor, designated for the access, construction and maintenance of improvements to the City of Tacoma infrastructure
- O. “Engineer” – a professional engineer licensed in the state of Washington who represents the owner/developer.
- P. “Erosion” – the wearing away of the ground surface as a result of the movement of wind, water, or ice.
- Q. “Excavation” – the mechanical removal of earth material.
- R. “Frontage Improvements” – includes the construction of street, sidewalk, curb and gutter on all adjacent City of Tacoma right-of-way.
- S. “Fill” – a deposit of earth material placed and compacted by artificial means.
- T. “Grading” – any excavating or filling or combination thereof.
- U. “Land Use Action” – action taken by the City of Tacoma Public Works Department when a variance, special use permit, rezone, plat, etc. is requested by the applicant typically resulting in a set of conditions for approval.
- V. “Land Use Administrator” – the City of Tacoma Land Use Administrator or his duly authorized representative.
- W. “Mylars” – Refer to section 2.050.A of this manual.
- X. “Oil Mat Road” – a temporary bituminous surface treatment provided to control dust and assist in the control of erosion. An oil mat road is not necessarily designed /constructed to the future grade.

- Y. “Performance Bond” – a surety instrument in which the faithful performance of a contractor is guaranteed up to the face value of the bond.
- Z. “Permit” – a document issued by Building and Land Use Services Division allowing construction as identified by said document in accordance with all applicable approved drawings and specifications.
- AA. “Planting Strip” – that portion of the street section between the sidewalk and the concrete curb and gutter. The dimension of the planter strip is defined from the face of curb to the front of walk.
- BB. “Private Accessway” – any access serving two or more lots located in a private easement, which is owned and maintained by a private owner, group of private owners or neighborhood association.
- CC. “Property Frontage” – that portion of the designated lot, parcel, or plat bordering City of Tacoma right-of-way. The property frontage shall be measured from the point in which the property lines intersect with the right-of-way line.
- DD. “Deficiency List” – a list developed at the time of substantial completion that itemizes all remaining work tasks that must be performed before a project reaches final acceptance.
- EE. “Residential Street Section” – Refer to Section 4.040.D of this manual.
- FF. “Right-of-way” – land reserved and secured to the public for the purpose of public improvements to the City of Tacoma infrastructure.
- GG. “Sanitary Sewer, Lateral” – that portion of the sanitary sewer service connected to the public sanitary sewer mainline extending to five (5) feet beyond the right-of-way, easement line, or the common utility trench.
- HH. “Sanitary Sewer, Public” – also, “Sanitary Sewer Mainline”; that portion of the sanitary sewer system contained in the public right-of-way or public utility easement excluding sewer laterals. Public sewers are owned and maintained by the City of Tacoma.
- II. “Street, Public” – an arterial or residential street located in public right-of-way owned and maintained by the City of Tacoma.
- JJ. “Streetlighting” – illumination of the traveled way designed and constructed in accordance with current IES standards.
- KK. “Surveyor” – a professional land surveyor, licensed in the State of Washington.
- LL. “Work Order” – Refer to section 2.010.A of this manual.

1.050 Abbreviations/Acronyms

- A. AASHTO - American Association of State Highway and Transportation Officials
- B. APWA - Washington State Chapter of the American Public Works Association
- C. CAD - Computer Aided Drafting
- D. CSTC - Crushed Surfacing Top Course
- E. CSBC – Crushed Surfacing Base Course
- F. HMA – Hot Mix Asphalt
- G. IES - Illuminating Engineering Society
- H. ITE - Institute of Transportation Engineers
- I. LID - Local Improvement District
- J. MUTCD - Manual on Uniform Traffic Control Devices
- K. TMC - City of Tacoma Municipal Code
- L. WSDOT - Washington State Department of Transportation
- M. GIS - Geographic Information System
- N. NGVD - National Geodetic Vertical Datum
- O. NAD - North American Datum

Chapter 2

The Work Order Process

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2.010 Introduction

This design manual focuses on the work order process as outlined in this chapter. The streetlighting work order process and the traffic signalization work order process as defined by this manual are separate and distinct processes from the process outlined in this chapter. An alternative to the work order process is to form a Local Improvement District (LID). A description of the LID process can be found in Chapter 9.

A. Work Order Definition

A "billable work order" is a mechanism used by the City for a multitude of tasks including the review, approval, and inspection of privately designed plans for the construction of City owned facilities. City owned facilities may be any number of various facilities, however, for the sake of this discussion, the term will refer only to the construction of sanitary sewers, storm drainage, permanent alley paving, permanent street paving, and associated appurtenances. Additional work order processes for the construction of streetlighting and traffic signalization are defined in Chapters 6 and 7 respectively.

B. Division of work orders

The City separates the construction of the facilities listed above into two separate work order categories: 1.) sanitary sewer construction and 2.) street, alley, and storm drainage construction. Generally, a separate work order must be opened for work proposed in either category. However, where the sanitary sewer systems, storm systems and road improvements all occur within the same right-of-way or for the same development, one single work order may be opened, and the information shown on the same plan sheets. This will generally apply only to projects involving plats, but if applicable, may be approved on other projects.

2.020 Authority and Permits

A. Enforcement

The Director of Public Works or his duly authorized agents are hereby authorized and it shall be their duty to enforce all the provisions of [Chapter 10.22, TMC]. Such duties shall include but not be limited to the approval of plans and specifications for any construction barricade or excavation, issuance of permits, establishment and collection of engineering inspection charges, repairs of cuts and reconditioning of street charges, inspection of constructing sidewalk, curb, gutter, grading, paving, storm and sanitary sewers, retaining walls, driveways or any other construction, barricade, or excavation in any street or alley, keeping of necessary records and gathering of evidence for the assistance in apprehending and prosecuting violators. (TMC 10.22.010)

B. Permit required

No person, firm or corporation shall grade, pave, level, alter, construct, repair, remove or excavate any pavement, sidewalk, crosswalk, curb, driveway, gutter, public sewer, water main, conduit, fuel tank, vault, or any other structure or improvement located over, under,

or upon any street, alley or other public place, or place any structure, building materials, earth, gravel, rock, garbage, debris or any other material or thing tending to obstruct, damage, disturb or interfere with the free use thereof or any improvement situate therein, or cause a dangerous condition thereon, without first obtaining a permit in writing from the Director of Public Works to do so. (TMC 10.22.020)

Some of the work covered under these standards may require multiple permit authority, review, and approvals. Several types of permits and approvals require prior approval from the authority before a building or other permit can be issued. Any questions regarding information about permits, approvals, and agreements should be directed to the Building and Land Use Services, Permit Counter.

C. Provisions for permit

Every permit shall require that the person, firm or corporation to whom the same is issued shall... ..carry on such work in conformance with the City's general specifications in effect at the time of issuance of permit... ..[and shall] comply with such additional conditions and provisions as may be prescribed by the Director of Public Works. (TMC 10.22.030)

2.030 Initiation of a Work Order

A flowchart showing the work order process from the initiation of the work order to the start of construction is provided at the end of this chapter. The flowchart briefly describes section 2.030 through section 2.070 below.

A. Opening a work order

To open a work order, an applicant must provide the following to the Building and Land Use Services, Permit Counter, 3rd floor, Tacoma Municipal Bldg., 747 Market St.:

- A completed Work Order Request Form. All correspondence will be sent to the individual listed as the contact person on the form, so please list accurate information as to address and phone number. A copy of the Work Order Request Form can be found at the end of this chapter.
- A scope of work plan either scaled or dimensioned that accurately conveys the project scope of work. This plan must stand alone and independently convey the scope of work without further explanation.
- A copy of the conditions of improvement. This may be a Hearing Examiner's report, concomitant agreement, short plat report or recorded short plat, a letter from the Public Works Department review panel or a list of requirements placed on a commercial building permit application.
- A deposit for opening the work order and initiating the plan review process as outlined on the Work Order Request Form found at the end of this chapter.

B. Work Order Estimate

In order to initiate the work order and cover the City of Tacoma's expenses for the review process, the City of Tacoma has established a deposit based on the approximate

linear footage of the proposed improvements. As a part of the plan review process, the City of Tacoma will provide to the applicant an itemized estimate to cover the City's remaining expected expenses. The City will estimate the costs it will incur on the project for tasks such as plan review, survey staking/verification, construction inspection, and updating records. This estimate will be sent to the contact person listed on the work order request form. The deposit for the initiation of the Work Order will be deducted from the total itemized estimate and any funds not expired in the review of the plans will be credited toward the remaining expected expenses (i.e. inspection, survey, etc.). Prior to work order approval, the balance of the itemized estimate must be paid. Upon receipt of the plans and the estimated deposit, the project will secure its place in line for plan review. The plans must be designed by an engineer licensed in the State of Washington.

2.040 The Review Process

A. Pre-Submittal Conference

Prior to submitting the first set of plans for complex projects, the engineer may elect to schedule a pre-submittal conference with the City staff that will be reviewing the design. The City strongly encourages this activity in that it may save time for both the engineer and the City during the review process.

B. Plan Review and Resubmittals

Upon submittal, the plans will be reviewed for conformance with City standards. Any modifications required will be placed on one of the plan sets for transmittal back to the engineer. It is then incumbent upon the engineer to incorporate these changes into the design. Depending on the accuracy of the plans, this process may take additional review iterations. The City will not show preference to one project over another and will review projects in the order that they are received; therefore, in order to expedite the review process, it is the responsibility of the engineer to complete the required corrections and return the plans to the City. Most work orders should be completed by the second submittal. If after the third submittal the plans do not seem to be significantly closer to an acceptable set of plans, the City may revise the original estimate to reflect the additional time and money spent reviewing the plans.

C. Prior to Approval

Before approval of the plans, the applicant must have completed all necessary forms, including the in lieu of assessment release form and private property construction permits. In addition, the applicant must have all necessary applicable permits such as: a wetlands' development permit; a separate grading, excavation, and erosion control permit; etc. When applicable, the City must have two copies of the approved grading, excavation, and erosion control plans before acceptance of the mylars. Please refer to Chapter 9 of this manual for explanations and copies of the forms listed above.

At this time, all necessary easements and right-of-way shall be recorded unless the said easement or right-of-way is exempt as defined in Chapter 9 of this manual. Furthermore, the mylars will not be released until all required fees have been paid, as outlined in section 2.030 of this manual.

2.050 The Approval Process

A. Approval of the Design Plans

Once the City has determined that the plans are satisfactory, the City will request the engineer to submit the mylars for signature. If the mylars are anything but original ink on mylar (e.g. velum, pencil, thermal mylars, or they have mat tack) the applicant must provide the City with fixed line photo mylars for signing.

B. Distribution of Plans

A reproducible set will be transmitted to the engineer or applicant together with written direction as to the remaining permit/preconstruction process. In addition, a copy of the approved plans will be transmitted to the various utilities. See the attached sample letters provided at the end of this chapter.

2.060 Revisions

Any change to the approved work order plans must be submitted for approval to the City of Tacoma Public Works Department prior to implementation in the field. Some minor changes may be verbally approved by the City of Tacoma, and the change in design noted on the record drawing plans submitted at the conclusion of the project.

In order to revise an approved plan, the engineer must obtain the original mylars from the City of Tacoma Public Works Department. Upon obtaining the original mylars, the engineer shall make the changes on the original mylars and identify the revision as such. The revision number, description and date shall be identified within the revision block located in the title block.

2.070 Contractor Responsibilities

A. Preconstruction Meeting

Subsequent to starting work, the applicant must contact the Public Works Construction Division at 591-5760 to schedule a preconstruction meeting as outlined in the sample letter directed to the engineer, provided at the end of this chapter.

B. Obtaining a Work Order Permit for construction

Upon approval of the plans and after the pre-construction meeting is held, a contractor meeting the following criteria, can then use the approved plans to obtain the work order permit. The contractor must:

- be licensed and bonded in the State of Washington.
- possess a City of Tacoma Business License.
- obtain a Street Obstruction Bond as outlined below.
- pay a work order permit processing fee (amount changes annually, \$25.40 during 2004).

C. Street Obstruction Bond

The contractor must deliver to the City of Tacoma, prior to the issuance of the permit, a street obstruction bond in the sum of not less than \$5,000, in a form to be approved by the City Attorney and with surety approved by the Director of Finance. Such bond shall be conditioned on the faithful conformance with the provisions of [Chapter 10.22 TMC] and shall be further conditioned to indemnify and save harmless the City of Tacoma from any and all judgments, costs or expenses arising from injuries or damage to any persons or property on account of said work, and shall be further conditioned that the permit applicant shall carry out and complete such work within the specified time, and according to the terms of such permit furnished by the Director of Public Works, and according to the City's general specifications. Such bond shall be continuously in effect from the date of issue, and may be further conditioned to cover all permits issued to the applicant; provided that such bond by its terms provides that the same shall not be canceled unless and until the Director of Public Works is given a written notice of such intention to cancel a minimum of 10 days before the effective date of said cancellation. Such bond shall further provide that it shall remain in full force and effect until the completion of any and all work which has been commenced, or is to be commenced, pursuant to any permits issued prior to the effective date of cancellation. Exceptions: (1) Persons or corporations with a valid City of Tacoma sign erector's license shall not be required to post a bond or other surety to be issued permits to work in public right-of-way; (2) the Director of Public Works may waive the bond obligation for an applicant who requests a permit to replace sidewalk, located in City right-of-way, immediately abutting the applicant's property, if that applicant provides the Director with adequate assurance that the applicant possesses the necessary skills, materials and equipment to properly perform the work in a timely manner. (TMC 10.22.030-E)

2.080 Construction and Inspection

A. Excerpt from the Tacoma Municipal Code

If, in the judgment of the Director of Public Works, the nature of the work shall be such under the provisions of [Chapter 10.22, TMC] as to require inspection and/or engineering on behalf of the City, either during the progress of the same or after the completion thereof, or both, may inspect and/or design or survey the same, and establish reasonable charges therefor in accordance with the average costs of like work. If the provisions of [Chapter 10.22, TMC] are not performed to the satisfaction of the Director of Public Works, then said Director of Public Works may cause the necessary work to be done to comply with the provisions of this chapter at the expense of the person doing such work. (TMC 10.22.060)

B. Work Authorized Under the Permit

After the pre-construction meeting has been held and the work order permit has been issued, the contractor may begin construction. The contractor, developer, or their agents must have an approved set of work order plans on site during construction. Right-of-way work outside of the scope dictated by the work order plans must be approved through a revision to the plans or under separate permits.

The permit advises the permit holder as responsible for assuring that all necessary inspections are called for in advance and approved by the City's Construction Inspector.

All specific inspections, test measurements or actions required for all work and materials are set forth in their respective chapters herein. Material and performance tests (i.e. compaction, compression tests for concrete, soil reports, etc.) shall be performed at no cost to the City.

Failure to comply with the provisions of this manual or the approved work order plans may result in a stop work order, removal and replacement of unacceptable work, or other penalties as established by ordinance.

2.090 Closure of the Work Order

A. Construction Deficiency List Items

Prior to final acceptance, the City's Construction Inspector shall provide the contractor with a construction deficiency list. The deficiency list will contain a complete list of required work to be performed to grant final acceptance.

B. Record Drawings

Prior to project closure, record drawings must be provided to the City of Tacoma Public Works Department. The criteria for creating the record drawing are outlined in the Record Drawing Criteria, which is required to be on all work order drawings (Refer to Chapter 3 for a copy of the Record Drawing Criteria).

C. Closure and Balancing Work Order Account

The City will update the approved mylars per the record drawings of the work order. Upon completion, the City will initiate closure and any funds remaining in the account will be refunded to the applicant. Conversely, if the account contains an outstanding balance, the City will bill the applicant for the funds necessary to cover the expenses already incurred by the City.

D. 24 Month Work Order Expiration

The City of Tacoma Public Works Department will consider a work order project abandoned if 24 months of time has expired without any action (Construction and/or design incomplete). The work order will be closed and the account settled accordingly.

2.100 Miscellaneous Information

The following information can be found on the subsequent sheets:

- Work Order Flow Chart
- Work Order Request Form
- Sample Letter to Engineer
- Sample Letter to Utilities

Work Order Flow Chart

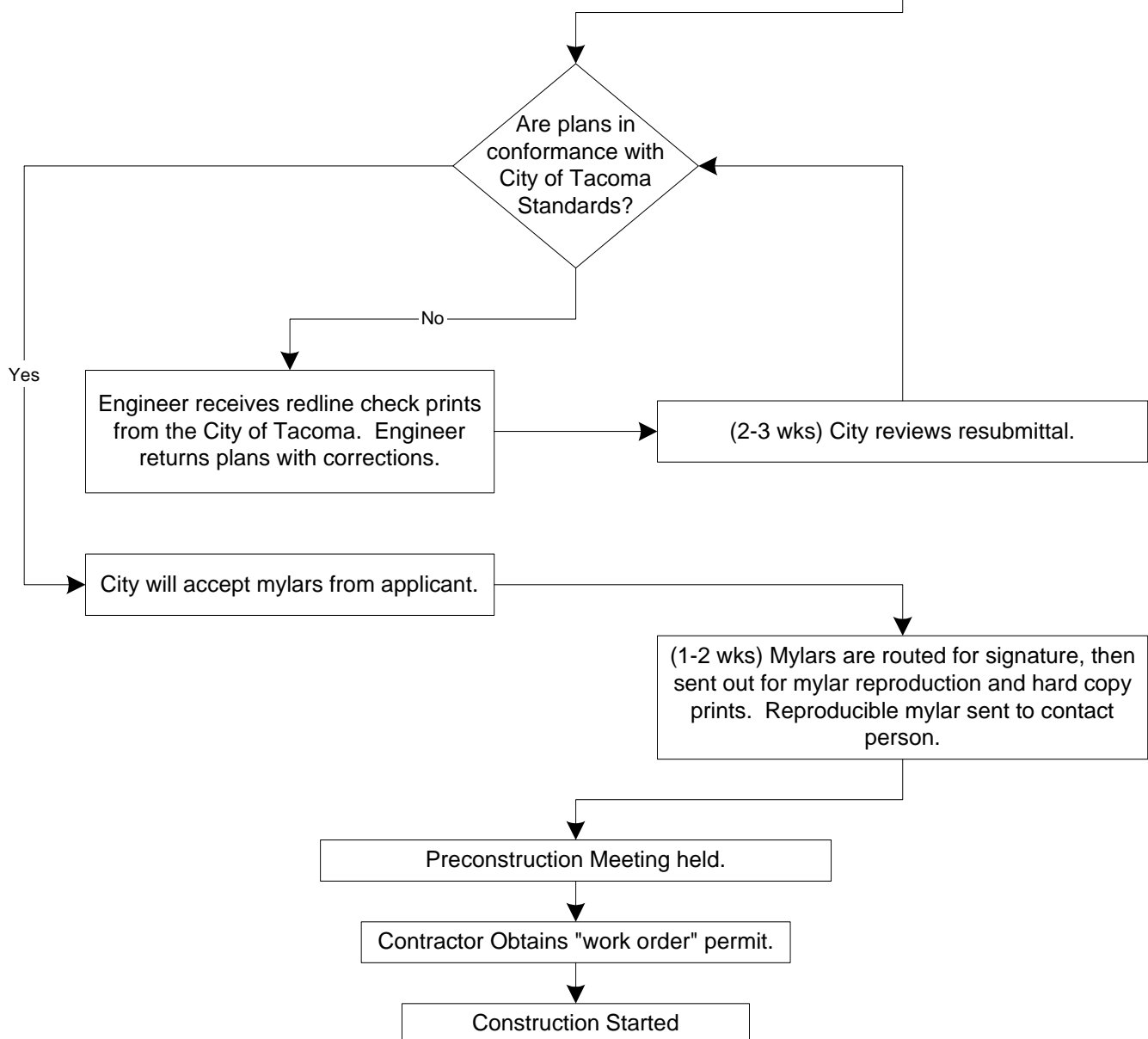
Applicant Requirements

Work Order is opened at Building and Land Use Services. See Work Order Process Information Sheet for required items to be submitted before a work order can be opened, and for a schedule of fees.
Project secures it's place in line for review.

City Requirements

All Time Durations listed are estimates only.
Time may vary with the work load and size of project.

(8-10 wks) Plans are reviewed by City for compliance with standards. The City of Tacoma will provide the applicant with an itemized cost estimate to cover the remaining expenses for approving the construction plans and providing remaining construction services.



**Department of Public Works**

747 Market Street, Room 620

Tacoma, WA 98402-3769

WORK ORDER REQUEST FORM

W.O. 6000000####

Receipt No. _____

Project Location _____ ~~Deposit~~ Amount _____

Scope of Work _____

Plat Name (If applicable) _____

Applicant: (company name) _____ Phone _____

(contact person) _____ Phone _____

Address _____ City _____ Zip _____

Owner: _____ Phone _____

Address _____ City _____ Zip _____

Engineer: _____ Phone _____

Address _____ City _____ Zip _____

Construction Staking Will Be Done: ☐ Privately ☐ By City

Are there Hearing Examiner requirements and/or Public Works Panel Review requirements relative to these proposed improvements? ☐ Yes ☐ No **If yes, said requirements are required to be included with this request.**

The estimated deposit for opening a work order and to initiate the plan checking is determined as follows:

Sanitary:	Up to 750'	\$1,000.00
	751' to 2000'	\$2,000.00
	2001' and up	\$3,000.00
Street or Street Widening:	Up to 750'	\$1,000.00
	751' to 3000'	\$3,000.00
	3001' and up	\$4,000.00
Storm:	0' to 750'	\$1,000.00
	751' to 3000'	\$3,000.00
	3001' and up	\$4,000.00

_____ Linear Feet of Sanitary Main Extension = \$ _____

_____ Linear Feet of Street Improvements = \$ _____

_____ Linear Feet of Storm Main Extension = \$ _____

Total Deposit = \$

Please be advised that the above deposit is only an estimate to initiate the plan checking, and additional cost is a strong possibility and is understood. Prior to plan approval, the City of Tacoma Public Works Department will provide to the applicant an itemized cost estimate to cover our remaining expenses for approving the construction plans and providing remaining construction services for the subject project. The above deposit will be deducted from the total itemized estimate and any funds not expired in the review of the plans will be credited toward the remaining expected expenses (i.e. inspection, survey, etc.). At the conclusion of construction and as-building of this project, the work order will be closed and any excess funds will be refunded. If additional funds are necessary at that time, you shall be so advised.

Signature of Applicant

Sample Letter to the Engineer

[Date]

[Addressee]

[Company]

[Address]

[City, State, Zip]

Subject: Work Order No. [6000000#####]

Dear : _____

We have completed the plan review and have approved the construction plans for the following improvements:

[Description]

A preconstruction meeting must be held before any work begins. Meetings must be scheduled with the Public Works Construction Division, 591-5760.

Attached is one set of reproducible transparencies of the subject plans for your use in processing a construction contract. Provisions of the contract should specify that the work shall be performed in conformance with the approved plans and in accordance with the "2004 WSDOT Standard Specifications for Road, Bridge and Municipal Construction" as supplemented by Washington State Chapter of the American Public Works Association (APWA). It is required that the contractor secure a permit from the Public Works Department before commencing the work.

The original set of plans will be kept in this office, and you may have access to them for printing purposes if you so desire and for any revisions, addenda, or as-built corrections that may become necessary.

We have forwarded copies of the plans to the various agencies having utilities which may be involved in the construction, and they have been notified that the details pertaining to their utilities should be coordinated with you.

Sincerely,

Daniel S. Handa, P.E.

Assistant Construction Division Manager

DSH:jm:(6000000#####)

Enclosure: Mylar

File W.O. No. [6000000#####]

Sample Letter to the Various Utilities

Date

Gordon Jones, Alarm System, 421 Tacoma Avenue South, Tacoma, WA 98402
Linda McCrea, TPU, Tacoma Water, Water Distribution Manager
Thad Glassy, TPU, Tacoma Power, Transmission and Distribution Admin
Chris Mantle, TPU, Tacoma Power, Click! Network (SW Annex)
Hardy Hanson, City of Tacoma Public Works, Streets & Grounds Division
Bob Guernsey, City of Tacoma Public Works, Environmental Services
Tracy Rossi, City of Tacoma Public Works, Env. Svcs., WWM, Source Control/Customer Service
Caroline Haynes-Castro, City of Tacoma Public Works, Building & Land Use Services Division
Steven Davis, City of Tacoma Public Works, Engineering Division
Craig Ralsten, AT&T Broadband, 20811 – 84th Avenue South, Suite 101, Kent, WA 98032
Yvonne Wiggins, QWEST Engineering, 2510 South 84th Street, Lakewood, WA 98499
Cheryl Paras, Puget Sound Energy, 3130 South 38th Street, Tacoma, WA 98409
Wes Carpenter, Sprint, 2606 – 70th Avenue East, Suite 102, Fife, WA 98424
Sheikh Moiwo, Manager, Moiwo Consulting Engineers, 11208 SE 232nd St, Kent, WA 98031
Robert Williamson, AT&T, 619 W Bannock St., Boise, ID 83072

Subject: Work Order No. 60000000####

[Description]

Enclosed for your information and use are the approved construction plans prepared by [Company Name]. Construction of this project will be done by private contract. Details pertaining to your utilities should be coordinated with [Engineer's Name], phone [(000) 000-0000].

A preconstruction meeting on all work orders will be held before any work begins. If you feel that you need to attend, please contact the Public Works Construction Division at 591-5760 for time and place. For efficiency, if more than one pre-construction meeting is scheduled please advise the Construction Division.

Daniel S. Handa, P.E.
Assistant Construction Division Mgr.

DSH:jm:60000000####

Enclosure: Construction Plans

File: W.O. No. 60000000####

ATTENTION!!!!, PLEASE DIRECT YOUR RESPONSE TO THE FOLLOWING

[Engineer's Name]
[Company Name]
[Address]
[City, State, Zip]

Chapter 3

Work Order Plan Format

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3.010 Introduction

This chapter does not address design criteria and is strictly dedicated to provide the engineer with some assistance in the development of the construction plans.

Design criteria focusing on the construction of street improvements and related appurtenances can be found in Chapter 4. Criteria concerning the design of sanitary sewer systems and storm main extensions and related appurtenances are located in Chapter 5.

The engineer should also reference the City of Tacoma Work Order Sample Plan. The Sample Plan has been developed to provide the design engineer with a representative plan showing the depth of detail required for submitting a set of work order plans to the City of Tacoma for review. The sample work order plans are at the end of this document. Full size prints may be purchased by contacting the Construction Division at 591-5760.

3.020 General Requirements

This chapter is to be used in conjunction with the checklist provided in Appendix B as a guideline for the minimum acceptable standards by which a set of drawings shall be submitted. Under no circumstances should this chapter, the checklist, or this design manual substitute for good engineering practice. To quickly reach approval, the engineer should take care in the preparation of the plans to verify that the plans are complete and clear.

A. Work Order Plans

The City's goal is to provide the contractor, inspector, and other various agencies with a set of plans that stand on their own. An individual should be able to locate and construct the designed improvements from the approved work order plans. Therefore, all site specific notes and details shall be included on the work order plans.

B. Public Works Projects

Projects designed by the Public Works Department differ from Private Work Order projects in several ways. Associated with each Public Works project is a set of contract specifications that compliment the design plans. Many details and notes, as well as contract documents, are contained within the contract specifications.

Public Works projects differ further from Private Work Order projects in that the City will administer the contract and provide full time inspection. In addition, City's survey crews normally perform all surveying for a Public Works project and the City's Construction Management staff maintains contact and communication with the City's design staff.

3.030 General Format

A. Sheet Size, Scale, and Basic Format

Sheet size shall be 22" x 34". The plans shall be shown and labeled as a 1"=20' horizontal scale and a 1"=5' vertical scale unless otherwise approved prior to submittal. Architect's scale will not be accepted.

The plans shall contain a plan and profile view with the street names clearly labeled in both. The stationing in the plan view should line up with the stationing in the profile. Stationing is read left to right. Where a "Match Line" is required, it should be clearly identified on plan and profile as such with the station noted and a reference to the sheet showing the continuation.

A vicinity map, together with a north designation arrow, shall be provided. The project shall be situated on the plan sheet such that north is either up or to the right. A legend shall be provided with all shading and symbols conforming to Standard Plan DR-01 (Appendix A) or an approved alternative.

B. Computer Aided Drafting (CAD) vs. Manual Drafting

The City encourages the use of computer-aided drafting tools over hand drafted drawings and in the future may require that plans be submitted electronically. In the mean time, the City strongly encourages electronically submitted plans along with the submittal of hard copies. In the near future, the City anticipates that the electronic format will reduce record drawing costs, as it will be easier to add the project to the City's govME system.

C. Title Block and Vertical Profile, Use gutter flow line for profiles of Street/Access ways

All plans shall be on 22" x 34" plans sheets bearing a City of Tacoma standard title block. The standard plan title block is available on the City's govME website (click on document information, then click on standard plans). Street, alley, access way and sewer profiles should be shown using the standard "three view, plan and profile grid," available at the same location on the govME website. The title block must contain a signed and dated seal of the project engineer. The title block contains spaces for the signature of the Assistant Division Manager/Construction Division, the work order number, and a brief description of the project to be noted along with the location of the site. In addition, the engineering company's name, address, and phone number must also appear in the title block. A revision block shall also be included, to be used by the City only after a set of plans has been signed off by the City as approved.

D. Professional Land Surveyor (PLS) required

Unless approved in advance by the Assistant Division Manager/Construction Division the design engineer shall submit work order drawings which are based upon a preliminary survey prepared by a licensed PLS. The work order preliminary survey shall be an accurate survey showing all existing topography which might be affected by the project work and include sufficient cross section elevations to prepare the drawings and

to provide sufficient information to the reviewing City engineer. Projects involving City streets, or, projects involving City sewers shall consider the possibility of future extensions, which may require survey ahead of and beyond the project limits. Advance consultation with the Construction Division is recommended in such cases.

E. Monumentation and Horizontal Control

All existing structures and new improvements shall be tied into the City's monumentation system. There shall be stationing on the construction centerline and an offset to the monument line if the construction centerline is not coincident with the monument line. Horizontal control shall be tied to two monuments, including necessary bearings, and the stationing of all monuments. All monuments must be labeled with a description of the monument (i.e. Surface Brass Mon., Mon. in Case, etc.).

The City encourages that state plane coordinates identify at least one of the monuments. Where coordinates are provided, the plans shall identify the current City of Tacoma Horizontal Datum:

North American Datum (N.A.D.) -- 83/91

New monuments to be constructed shall be shown and identified on the plans. The type and station of each monument shall be identified.

F. Vertical Control and Datum

All elevations shown on the drawings shall be on the current City of Tacoma datum as described below. The plans shall identify the current City of Tacoma vertical datum: National Geodetic Vertical Datum (N.G.V.D.) -- 1929.

A City of Tacoma benchmark must be used and a description of the benchmark shall be shown and labeled on the plans.

A temporary benchmark may be shown on the plans in conjunction with an existing City of Tacoma benchmark. However, the engineer must verify that the temporary benchmark is on the correct datum.

G. Additional Items to be Identified

All right-of-way, easements, and property lines shall be shown, and labeled on the plans. All easements shall be dimensioned and labeled as public or private. All wetland boundaries and buffers in the project vicinity must be labeled on the plans. All existing improvements shall be shown and labeled on the plans including, but not limited to; surfacing, vegetation, access, utilities, walls, steps, existing and proposed building footprints, driveways, curb ramps, and walkways. All proposed improvements shall be shown and labeled on the plans including, but not limited to; grading, paving, driveways, sidewalks, curb ramps, and drainage. The plans shall note when matching existing features and utilities. Include property addresses for all parcels shown on the plans.

H. Drawing Clutter

Providing plans with as much detail as possible is helpful to the City plan reviewer. However providing increasing drawing detail should also be accompanied by the appropriate use of line weight and font size. To make drawings easier to interpret, the work order related construction items should be highlighted using heavier line weights and larger fonts. Non-work order related work should be de-emphasized by using lighter line weights and smaller fonts. Examples of non-work order related details include existing improvements, property lines, existing contour lines, existing and proposed private utilities.

3.040 Street Plans

A. Plan View

The plan view shall clearly show the street work to be constructed under the work order. Meetlines shall be clearly defined and denoted as such. Sidewalks and driveways shall either be noted as being constructed under the work order or shall be noted as being constructed during the building permit stage. Proposed and existing driveways shall be shown together with centerline stations and driveway widths.

All horizontal curve information shall be shown on the plan. The plan shall show and label the beginning and end point of the horizontal curve, point of intersection, Length, Radius, Delta angle, and Degree. All horizontal angle points shall also be identified.

Pavement tapers shown on the plan shall be identified by the beginning station and offset, the taper length, together with the ending station and offset.

B. Profile

The City of Tacoma no longer uses curb elevations on plans. Gutter (flowline) elevations shall be shown on the street, access way, and alley profiles. The existing centerline profile shall be shown and identified. In areas where the right and left gutter profiles diverge, the plan shall clearly identify each gutter profile. Flowline elevations may be broken at the end of the radius (ER's) for the curb return at street intersections. Separate intersection detail "go-rounds" are to be provided on the plans which show pavement elevations within intersections (see Section 3.060C Intersection Details).

The profile view shall show and label each grade, vertical curve, Point of Vertical Curvature (PVC), Point of Vertical Intersection (PVI), Point of Vertical Tangency (PVT), grade break, and top of curb/gutter elevations. The gutter elevations, left and right, should be spaced at 50 feet on straight grades and 25 feet through vertical and horizontal curves.

Where connecting to an existing grade, the profile of the existing pavement shall be shown a minimum of 50 feet beyond the limits of improvement. The existing profile

grade shall be shown in conjunction with any existing grade breaks and vertical curve information. Refer to Chapter 4 for additional information.

In some instances it may be necessary to extend the limits of the design, or show additional information, to insure that the proposed improvements will not inhibit future construction.

C. Cut and Fills

Cut and fill catch points shall be shown for all cuts or fills over approximately one foot in depth or where the catch point will encroach on private property. Private property construction permits shall be completed for each adjacent private property impacted by the project. (Ref. Chapter 9). Refer to the end of this chapter for an informational sketch showing the definition of a cut and fill “catch point”

D. Private Access ways

Private access ways, although not owned and maintained by the City, are reviewed and inspected by the City for conformance with the development conditions. The format for identifying private access ways shall be consistent with Section 1.030.F.

3.050 Storm and Sanitary Plans

A. Mainlines, Manholes and Catch Basins

The plans shall clearly identify the pipe diameter, length, slope, and pipe material. The distance of each main from the monument line or construction centerline shall be identified in the plan view. The plans shall show all structures and clearly identify the size and type of structure, station, offset, rim elevation, and all invert elevations (existing and proposed). All utility crossings shall also be shown and identified in the plan and profile.

B. Sanitary Laterals (Side Sewers)

The location of all proposed sanitary laterals and tees shall be clearly shown on the plan (station location of each end of the lateral). When extending a City sanitary sewer main, tees shall be constructed for all properties that could be served by the sewer extension.

Laterals shall be constructed five (5) feet beyond the right-of-way limits, the easement limits, or the common utility trench where applicable. The proposed connection to the building should not be shown on the work order plans. Private connections to the sanitary lateral require separate side sewer connection permits.

C. Private Utilities

In some instances, private utilities may need to be shown on the plans. Private utilities shown on the plan (such as private storm drainage) shall be de-emphasized and denoted as private. The dimension of each utility from the monline or construction centerline should be identified in the plan view and where applicable in the profile.

D. Surface Water Treatment and Flow Control

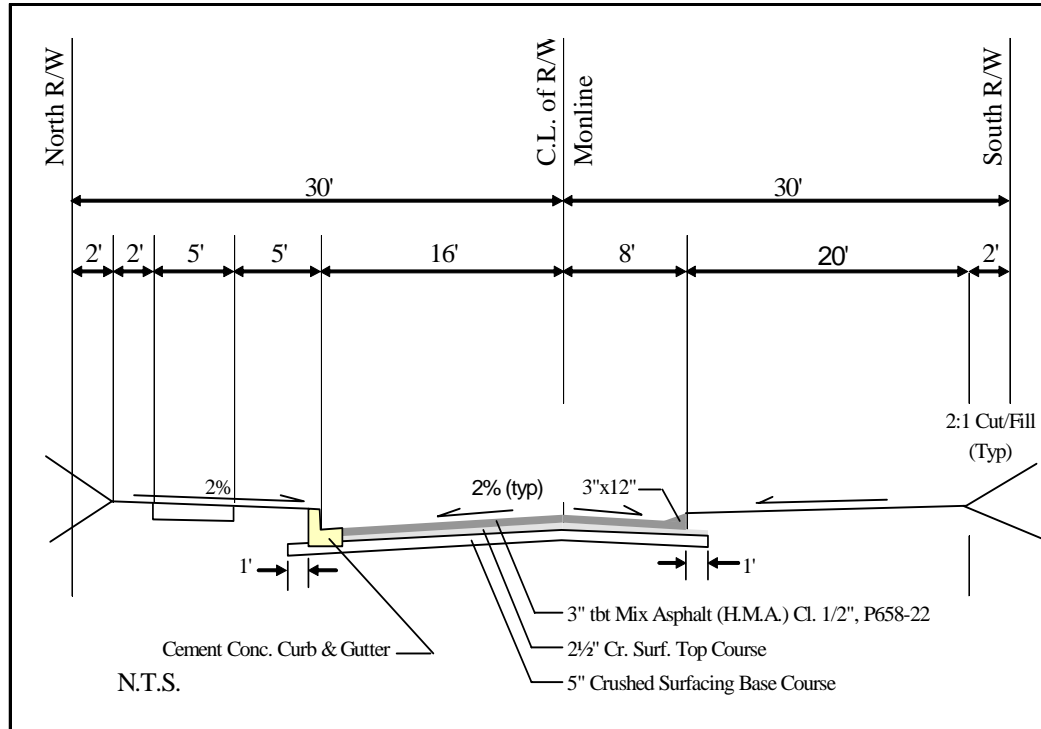
Treatment and flow control facilities, control structures, access, etc. shall be shown on the work order drawings if it is to be part of the City's drainage system. The engineer should contact the Public Works Environmental Services, Science and Engineering Division at 253-591-5588 or reference the City of Tacoma Surface Water Manual regarding the design standards of these systems.

3.060 Details

A. Typical Sections

A typical roadway section shall be included on the plans for each unique cross section of roadway and/or at the beginning and end of a transition section. Corresponding street names and stations shall be shown for each section. The section shall include improvements to be constructed within the right-of-way. The centerline of the right-of-way and/or monument line shall be shown and labeled and the relationship to the construction center line shall be shown if not coincident. The typical roadway section shall also include: the street section, the type and/or dimensions of the curb, the cross-slope or a relationship from the crown to the gutter, the dimensions of sidewalk, the dimensions of the planter strip, the relationship to the top of the cut or the toe of the fill, the slope of the planter strip and sidewalk, and any other existing or proposed improvements that reoccur and is paramount to the design.

A typical half street section is shown as follows based on a future 32' street section:



B. Cross Sections

Cross sections at regular intervals may be required in areas where street widening is proposed to verify that the meetline is adequately designed. Cross sections are an aid in the design review and may either be shown on the plan or submitted separately. Cross sections should be shown with the corresponding station every 25-50 feet. For each cross section, the elevation and offset of the centerline and/or crown, the meetline, both gutter lines, and the existing front of walks shall be identified where applicable. In addition, corresponding cross slope grades for each change in grade shall be shown.

C. Intersection Details

Intersection details shall be included for each intersection affected by the project. The intersection details shall include, at a minimum, elevations at: centerline of pavement, gutter, gutter-gutter intersects, half delta on radius, and the end of radius (labeled as such). A three-line profile shall be completed for each roadway and additional gutter line profiles shall be completed for each radius (extend profile lines beyond ER for determination of entering/exiting grade). Refer to City of Tacoma Public Works Standard Plan No. DR-07 for a sample of a typical intersection detail.

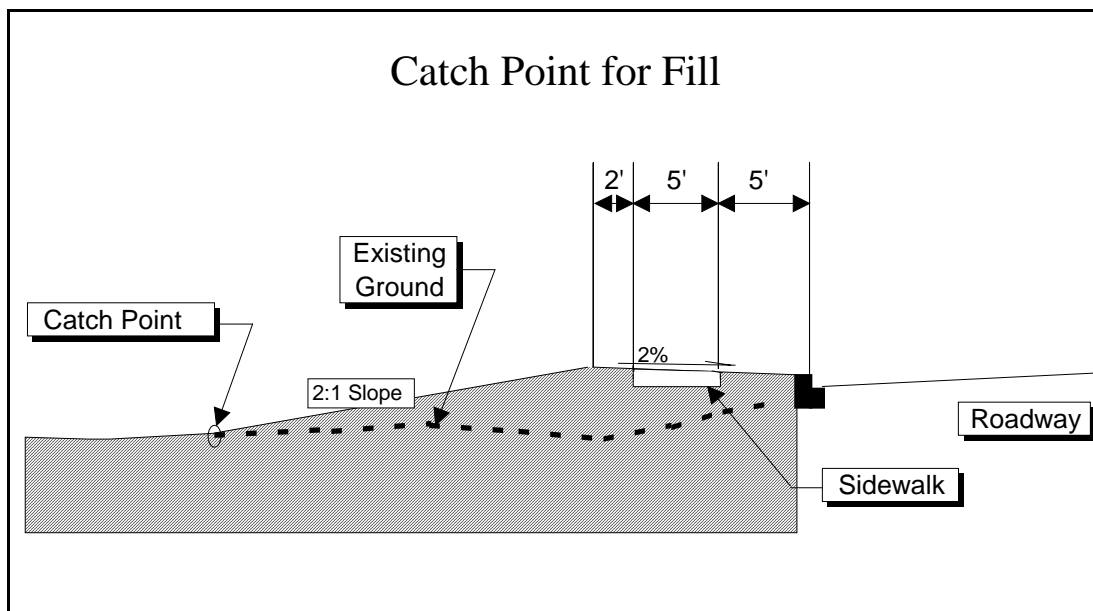
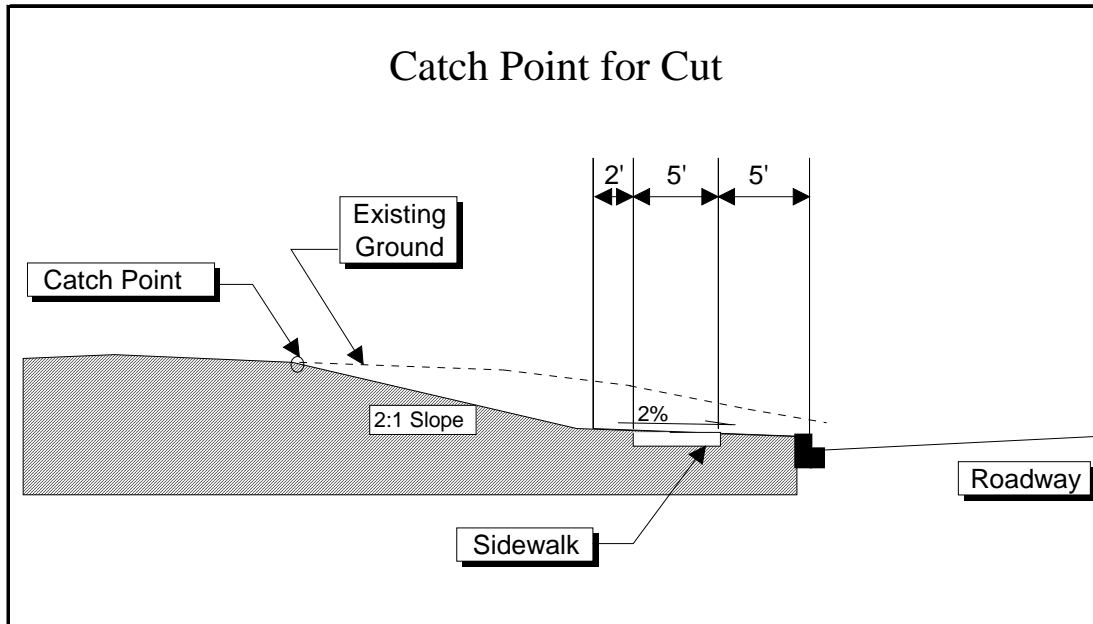
D. Additional Notes and Details for Work Order Plans

All necessary notes and details must be included within the plans. As a minimum, the work order standard specifications, the record drawing criteria, and the staking notes and detail shall be included. The work order standard specifications, record drawing criteria, and the staking notes are included in the Public Works Standard Plans.

If a separate grading excavation and erosion control permit is not required or if required grading, excavation, and erosion control plan does not address work to be performed within the right-of-way, erosion control best management practices (as required by the Surface Water Management Manual) and the erosion control notes shall be included. Additional details may be required as dictated by the season, site, and proposed improvements. Typical erosion control notes and checklist are provided at the end of this chapter. Please see Chapter 9 for additional comments regarding grading, excavation, and erosion control.

As required by the 2003 City of Tacoma Surface Water Management Manual, a stormwater pollution prevention plan will be required on all work orders. The SWPPP shall be submitted along with the work order submittal and will be reviewed as such. The SWPPP must be approved before the work order will be approved.

Portion of Typical Cross Section Illustrating Cut and Fill Catch Points (Info Only)



Chapter 4

Street Design

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4.010 Basis for Geometric Design

Geometric design of roadways shall generally conform to the requirements of the *AASHTO Policy*. AASHTO contains various recommendations, tables and figures. *AASHTO Policy* is mainly geared toward high speed freeway applications rather than the local, collector or arterial urban streets. As a result, many of the recommendations contained within AASHTO apply to specific roadway conditions. It is essential that the engineer carefully research the *AASHTO Policy* to ensure that the recommendations are applicable to the project conditions.

A. Design Speed

The City considers the design speed of a facility to generally be determined as 5 mph above the “85th Percentile” speed of the prevailing traffic on the subject roadway. However, on new construction or reconstruction, which significantly alters the characteristics of the roadway, the design speed shall be considered as the posted, designated, or proposed speed limit plus five (5) mph.

The designated speed limit for Tacoma residential streets is 25 mph which corresponds to a 30 mph design speed. Alleys shall be designed using a 20 mph design speed. The designated speed for arterials in Tacoma varies. The engineer should contact the Traffic Engineering Section of the Engineering Division at 591-5500 for determination of the design speed when the project scope of work includes significantly altering the design of a designated arterial. For non-arterials, in locations where conditions warrant, a reduced design speed may be considered on a case by case basis. Documentation must be provided justifying any and all deviations from the standard design speed.

B. Stopping Sight Distance

Stopping Sight Distance is the sum of two distances: the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the distance when the brakes are applied; and the distance required to stop the vehicle from the instant brake application begins. These are referred to as brake reaction distance and braking distance, respectively. The height of the driver’s eye is considered to be 3.5 feet. The minimum height of the object is considered to be twenty-four (24) inches. AASHTO *Policy* has tabulated design values for Stopping Sight Distance and has summarized these recommendations in Exhibit 3-1 *Stopping sight distance (wet pavements)*. As stated in AASHTO, the upper design values shall be used wherever conditions permit.

C. Design Vehicle

Typical residential streets and alleys are to be designed to accommodate a single unit vehicle (SU-30) within the driving lane.

Typical arterial streets, as well as streets in industrial/commercial areas, are to be designed to accommodate a WB-50 design vehicle within the established and striped driving lanes.

4.020 Geometric Design

A. Temporary vs. Permanent Improvements

The City generally classifies a permanent street section as consisting of concrete curb and gutter and/or sidewalk in combination with a standard residential or arterial street section (as defined in this chapter). In some instances, the conditions or the design of the permanent improvements may mandate providing some temporary improvements to accommodate tapers, access, drainage, etc. Although these improvements are classified as temporary improvements, there is no guarantee that the permanent improvements will be constructed in the near future. Hence, temporary improvements shall conform to the geometric guidelines outlined in this section.

Providing dust and erosion control are some of the primary objectives for providing temporary improvements such as oil-mat streets. In many areas of the City, temporary improvements have been placed in the past without taking into consideration the future improvements. Where permanent improvements (i.e. curb and gutter) will be designed and constructed adjacent to any temporary improvements, the engineer must provide a design for the permanent improvements using the criteria stated below in the following order:

1. The geometric design of the permanent improvements shall conform to this chapter AND the design shall meet any existing adjacent permanent improvements.
2. The geometric design of the permanent improvements shall conform to this chapter AND the design shall take into consideration any future improvements which would tie into existing permanent improvements in the vicinity.
3. The geometric design of the permanent improvements shall conform to this chapter AND the design shall provide a best fit design which will adequately meet any existing temporary improvements.

Under no circumstances shall an oil mat or other substandard temporary street section solely dictate the design of the permanent street improvements. A safe, smooth transition must be provided to any temporary improvements. Additional pavement removal and replacement may be required to provide an adequate transition or crown to the street. In some cases removal and replacement of the street may extend to the centerline or beyond the centerline. In other cases, removal of the entire temporary street may be required.

B. Straight Grades

Through experience, the City of Tacoma has found that without providing a mechanism for controlling grade, such as through the use of concrete curb and gutter, asphalt cannot be placed at a grade less than 1 percent and maintain positive drainage. Therefore, where asphalt wedge curbs will be constructed, a 1 percent minimum longitudinal grade shall be provided or some mechanism for temporary grade control addressed in the design. When concrete curb and gutter is being installed the minimum longitudinal grade may be reduced to not less than 0.5 percent.

Due to the difference in minimum grades between temporary asphalt wedge curb, and the construction of permanent curb and gutter, the grades required in order to construct the temporary asphalt wedge curb may substantially control the design of a half street.

Maximum grades for residential streets should be less than 15% as outlined in AASHTO, Chapter 5. Additionally, in commercial and industrial areas, grades shall not exceed 8%, although a 5% maximum is the desirable target. The engineer should refer to the AASHTO policy Exhibit 6-8 for maximum grades for collector arterials and Exhibit 7-10 for maximum grades for other arterials.

C. Horizontal Curves

The design engineer shall refer to the AASHTO *Policy* and the accompanying text for a determination of minimum acceptable horizontal curves. The “Vehicle speed” shall be the design speed as discussed in Section 4.010.A of this manual.

Generally, non-arterial streets shall be designed with a standard pavement cross-section (2% crown) where feasible (Refer to 4.040.C). Where necessary and justified, super elevation greater than the standard cross-slope will be considered. Generally, the allowable maximum cross-slope is 6%. Arterial streets with design speeds of 40 mph or less shall also be designed in conformance with this section. Arterial streets with design speeds of greater than 40 mph shall be designed in accordance with AASHTO *Policy* and the accompanying text.

D. Tapers and Transitions

All tapers shall be in conformance with the MUTCD as referenced by AASHTO. The engineer shall refer to the MUTCD *Part III Markings* for guidance. According to the MUTCD, tapers shall conform to the formula $L = WS^2/60$, where:

L = the taper length in feet.

W = the width/dimension of the taper or transition in feet.

S = the design speed in miles per hour.

E. Vertical Curves (Crest)

The engineer shall refer to the AASHTO *Policy* Exhibits 3-75 and 3-76 for minimum requirements in the design of crest vertical curves. Designing to the higher design values for the corresponding design speed, is considered the desirable practice.

F. Vertical Curves (Sag)

The engineer shall refer to the AASHTO *Policy* Exhibit 3-78 for minimum requirements in the design of sag vertical curves. Designing to the higher design values for the corresponding design speed, is considered the desirable practice.

Where cost or topographic conditions justify a deviation from the above stated desirable practice, reduction in the length of a sag vertical curve may be considered in areas where adequate fixed source lighting (streetlighting) exists or is included as a part of the project.

Where approved, the sag vertical curve may be reduced to an absolute minimum as determined by the “comfort” criteria, described in Chapter 3 of the AASHTO *Policy*.

G. Grade Breaks

The City allows for a 1% maximum grade break in place of a vertical curve. Grade breaks are not allowed at the beginning of vertical curvature (PVC) or the end of vertical tangency (PVT) of a vertical curve, in close proximity to a vertical curve, or in close proximity to another grade break. The minimum separation from grade break to a vertical curve or another grade break can be calculated by inserting a vertical curve in place of the grade break.

Example:

Given: Reference 2001 AASHTO, Exhibit 3-76 (English Version)

30 mph design speed

If designing a crest vertical curve with a 30 mph design speed, the K-value based on AASHTO is 19. For a 1% grade break, the vertical curve equivalent would be 19 feet in length. In that vertical curves may not overlap each other, the minimum spacing between two 1% crest grade breaks is 19 feet. Likewise, a 1% crest grade break could not be located within 9.5 feet of the beginning or end of a vertical curve.

4.030 Intersections

Design of the intersections shall be conveyed through intersection details as outlined in Chapter 3. Intersections shall be designed with the following criteria:

- All vehicle paths shall have a smooth transition through the intersection.
- Intersection grade shall not exceed 6%.
- Minimum 1% slope around intersection corners.
- The engineer should review the diagonal profile from the centerline/centerline intersect to the $\frac{1}{2}$ delta point of the radius through the gutter/gutter intersect as shown in Figure 4-1, taking into consideration the one (1) inch lip of the gutter as shown in the detail for curb and gutter on Public Works Standard Plan No. SU-03 (Appendix A).

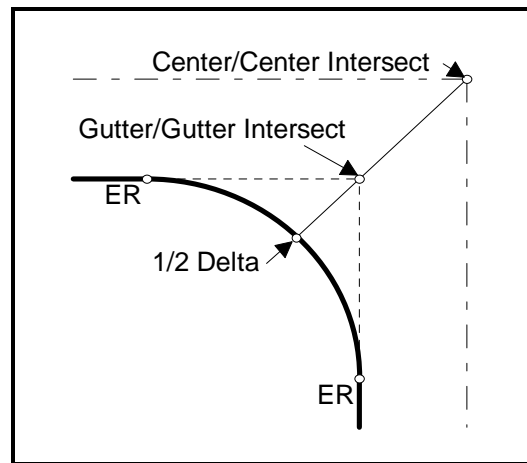


Figure 4-1

A. Sight Distance for Uncontrolled Intersections

Generally, the intersections of two non-arterial streets are not controlled by yield signs, stop signs or traffic signals. The operator of a vehicle approaching an intersection must be able to perceive hazard in sufficient time to alter the vehicle's speed as necessary before reaching the intersection. This condition is designated as Case A in the AASHTO *Policy*. New construction shall be designed to provide Case A sight distance to conform

to a 20 mph design speed at intersections. According to the AASHTO *Policy* a 90-foot sight triangle is required for a 20-mph design speed.

B. Sight Distance for Private Accessways and STOP Controlled Intersections

The engineer shall refer to the AASHTO *Policy* section referring to *At-Grade Intersections - Sight Distance*. The general guideline shall be to conform to the sight distance requirements of Figure IX-40 *Intersection Sight Distance at at-grade intersections*. The desirable distance from the edge of the intersecting road travel lane to the driver's eye should be 15 feet at all intersections. Where conditions dictate a lesser distance the minimum shall be 12 feet at public street intersections and ten (10) feet for private road intersections or private driveway access points. For intersection design, the height of the driver's eye is considered to be 3.5 feet, and the height of the object in the conflicting street shall be considered to be 4.25 feet.

4.040 Street Section

A. Street Width

Please see Chapter 1 for basic requirements regarding street width. The City of Tacoma Municipal Code defines a minimum residential street width of 28 feet for new plats. However, the existing improvements may dictate the alignment of the curb in many areas of the City. The engineer shall review the existing improvements in the area and base the design of the street section accordingly. For new residential streets where the permanent alignment of the curb and gutter has not been established, a minimum 28 foot width may be used.

B. Lane Widths

Standard lane widths by street width are as follows:

Street Width:	Curb Lane:	Inside Lane:	Turn Lane:
56 Foot Street	12 Feet	11 Feet	10 Feet
44 Foot Street	11.5 Feet	10.5 Feet	N/A
40 Foot Street	15 Feet	N/A	10 Feet
28/32 Foot Street	14/16 Feet	N/A	N/A

C. Cross Sections

It should be noted that the following tables and accompanying text in this subsection are based on the design of a full street section. Design of a half street section should take into account the future permanent improvements and adjust the cross section accordingly.

The City standard street section consists of a typical crown section with the elevations of the right and left gutters being equal. Where existing conditions dictate a variance from the standard, a full warp cross section may be considered. An offset crown is typically used to transition to the full warp section from a standard crown section.

Table 4-1 provides a guideline illustrating which section is most appropriate based on typical street widths and the difference in the gutter elevations.

Table 4-1 - Type of Section

Street Width:	Difference in Gutter Elevations:	Type of Section:
28 to 36 Feet	0 to 0.4 Feet	Typical Crown
	0.4 to 0.75 Feet	Offset Crown
	0.75 to Max.	Full Warp
40 to 44 Feet	0 to 0.6 Feet	Typical Crown
	0.6 to 1.0 Feet	Offset Crown
	1.0 to Max.	Full Warp
56 Feet	0 to 0.8 Feet	Typical Crown
	0.8 to 1.2 Feet	Offset Crown
	1.2 to Max.	Full Warp

The City has found that the paving methods typically used in the field do not promote the use of a parabolic crown for street widths equal to or less than 32 feet. In these cases, a linear crown should be used. Table 4-2 provides a guideline for the design of a typical crown cross section. The centerline elevation is determined by averaging the gutter elevations and adding the centerline adjustment as shown in the table. The quarter point elevation is determined by subtracting the quarter point adjustment shown in the table from the previously determined centerline elevation.

Table 4-2 - Adjustments to a Typical Crown Cross Section

Street Width:	Section:	Centerline Adjustment:	Quarter Point Adjustment:
Up to 32 Feet	Linear	0.35 to 0.4 Foot	N/A
Between 32 and 44 Feet	Parabolic	0.4 to 0.5 Foot	0.1 Foot
Between 44 and 56 Feet	Parabolic	0.6 Foot	0.15 Foot

A top of curb or gutterline profile shall be shown for streets providing a consistent typical crown section where the difference in gutterline elevations is zero. For streets where the absolute difference in gutter elevations is greater than zero, a three line profile (Centerline, Left, and Right) or an adequate number of cross sections shall be provided.

D. Pavement Section

The City standard pavement sections are provided below. These sections may vary dependent upon the soil conditions at the location of development (i.e. the industrial districts of the City commonly referred to as the "Tideflats"). Geotechnical data supporting the proposed street section may be required. These standard sections are designed to be placed upon a firm and unyielding base as outlined in Section 2-06 of the Standard Specifications. Testing the subgrade by "proof rolling" to verify the condition shall be required by the City's Construction Inspector in the field.

The City of Tacoma typical residential street section consists of:

- 3" Asphalt (H.M.A., Cl. ½", PG 58-22)
- 2½" Crushed Surfacing Top Course
- 5" Crushed Surfacing Base Course

The City of Tacoma typical arterial street section consists of:

- 3" H.M.A., Cl. ½", PG 58-22
- 1½" Crushed Surfacing Top Course
- 7½" Crushed Surfacing Base Course

An Asphalt Treated Base (ATB) section as follows may be used in place of a standard residential street section where approved:

- | | | |
|---------------------------------|-----|---------------------------------|
| 3" H.M.A. Cl. ½", PG58-22 | Or: | 2" H.M.A. Cl. ½", PG58-22 |
| 3" Asphalt Treated Base | | 4" Asphalt Treated Base |
| 2" Crushed Surfacing Top Course | | 2" Crushed Surfacing Top Course |

The base material for all sections shall extend one (1) foot beyond the back of the concrete curb and gutter or the back of the asphalt wedge curb.

The engineer may also elect to utilize the "AASHTO Guide for Design of Pavement Structures" recognizing a minimum design life of twenty years and taking into consideration the average daily traffic, vehicle type, and the existing soil conditions.

E. Curb and Gutter

City of Tacoma standard cement concrete curb and gutter shall be constructed unless otherwise approved (Standard Plan No. SU-03). The grade point for curbs shall be the top of curb. The face of the curb shall denote the alignment as referenced by the City of Tacoma Standard Staking Detail (Standard Plan No. SU-26).

In some cases, where full warp street sections are approved, the City may direct the engineer to "lip down" (modified such that the gutter does not trap water). Lipped down gutters may also be required in the design of intersections, on street parking stalls, bus turnouts, streets with full warps, etc.

F. Asphalt Wedge Curb

In areas where curb and gutter is not required, all new asphalt pavement shall include an asphalt wedge curb. An asphalt wedge curb consists of a three (3) inch high by 12 inch wide thickened edge of asphalt. Where a full warp of the street is approved and the proposed asphalt wedge curb is on the downhill side of the warp, a six (6) inch by 18 inch asphalt wedge curb shall be used.

Typically, the top of the asphalt wedge curb does not provide for a reliable vertical control point; therefore, the grade point of an asphalt wedge curb shall be the flowline as referenced by the City of Tacoma Standard Staking Detail (Standard Plan No. SU-26). The back of the wedge curb shall denote the alignment.

G. Sidewalks

Please reference “Pedestrian Facilities” in this chapter.

H. Cut and Fill Slopes

Cut and fill slopes shall be no steeper than 2:1 unless otherwise approved. When varying from this standard, geotechnical information may be required to support the request.

The toe of the fill or the top of the cut shall be a minimum of two (2) feet behind the back of the walk. In areas where sidewalk will not be constructed at this time, the toe/top of slope shall be a minimum of two (2) feet behind the future sidewalk alignment. In areas where the construction of sidewalks has been waived, the toe/top of slope shall be a minimum of two (2) feet behind the back of the new curb.

4.050 Access

A. Driveways

All driveways shall be in conformance with the Tacoma Municipal Code, Chapter 10.14 – Driveways. The Tacoma Municipal Code is listed on the City of Tacoma’s website, see drop down under “City Hall,” then “Public Information.”

Public Works Standard Plan No. SU-07 and SU-08 show driveways used for residential and commercial access and at the entrance to private access ways.

Type I and type II concrete driveways are to be constructed where concrete curb and gutter is proposed or existing. Temporary asphalt driveways should be constructed elsewhere.

The City may require an increased driveway thickness or steel reinforcement over that shown in the standard plans in the area of the Tideflats or where poor soil conditions exist.

B. Private Access Ways (Serving up to 4 Lots)

A private access way serving four (4) lots or fewer may be designed as outlined in this section. Private streets serving plots and/or five (5) or more lots shall be designed to City standards as outlined in this chapter and in Chapter 5.

The City does not perform a complete review of the geometric design of the roadway. It is incumbent upon the design engineer to provide safe adequate access for all lots. The City of Tacoma strongly recommends that the design engineer meet the minimum AASHTO standards as discussed in this chapter.

The City of Tacoma will review the private access way based on the following criteria:

- Type I or II concrete driveway provided where the private access way enters onto public right-of-way where permanent concrete curb and gutter is existing or

proposed. A temporary asphalt approach shall be provided if concrete curb and gutter does not exist nor is proposed.

- Street section is in conformance with the conditions.
- Turn-around meets City standards.
- Longitudinal grades are less than 15%.
- Adverse impacts to adjacent private property have been properly addressed.

C. Alleys

A minimum right-of-way width of an alley in a residential block, when platted, shall be 20 feet. Alleys may be required in the rear of commercial and industrial districts and, where required, shall be at least 20 feet wide. (13.04.200 TMC.)

Improvements of alley right-of-way may be required when the alley is to be utilized as access to a residence, parking lot, or as otherwise directed by the City of Tacoma Public Works Department. The City's typical alley section consists of three (3) inches of Asphalt (H.M.A., Cl. 1/2," PG 58-22), 2½ inches of Crushed Surfacing Top Course, and five (5) inches of Crushed Surfacing Base Course.

The geometric design shall conform to the criteria as set forth in section 4.020 of this chapter using a 20 mph design speed. The typical paved width of an alley in a residential area is 16 feet, with wedge curbs on both sides. When constructing a new alley that connects to existing or proposed curb and gutter, a concrete alley return conforming to Public Works Standard Plan No. SU-09 shall be provided. Public Works Standard Plan No. SU-09 details the sidewalk section through the alley.

4.060 Dead Ends

In general, dead-end (cul-de-sac) streets shall not be longer than 500 feet. Any dead-end street in excess of 150 feet in length shall terminate in a turnaround with a minimum curb radius of 45 feet. A center island with a maximum width of 30 feet may be constructed within the cul-de-sac. Any dead-end street with four or fewer lots accessing the street may satisfy this requirement with the construction of a T-type or branch turnaround subject to approval by the City Engineer. (13.04.190 TMC)

A. Turn-arounds

As stated in Section 902 of the Uniform Fire Code, an approved turn-around, shall be designed and constructed for all dead end streets or private accessways over 150' in length.

For private accessways serving three (3) to four (4) lots a City of Tacoma standard “hammerhead” or “branch” turn-a-round should be constructed as shown in Figure 4-2.

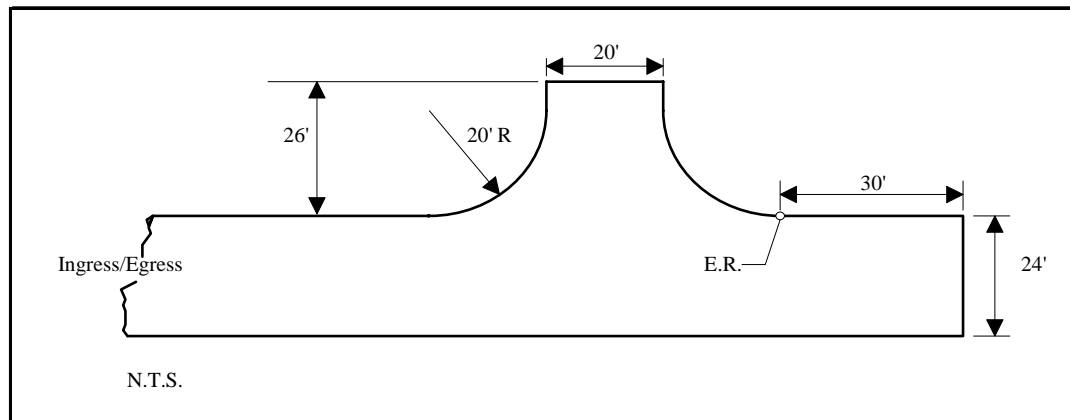


Figure 4-2

For private accessways or residential streets serving three (3) to four (4) lots, a standard “T-Type” turn-a-round should be used as shown in Figure 4-3.

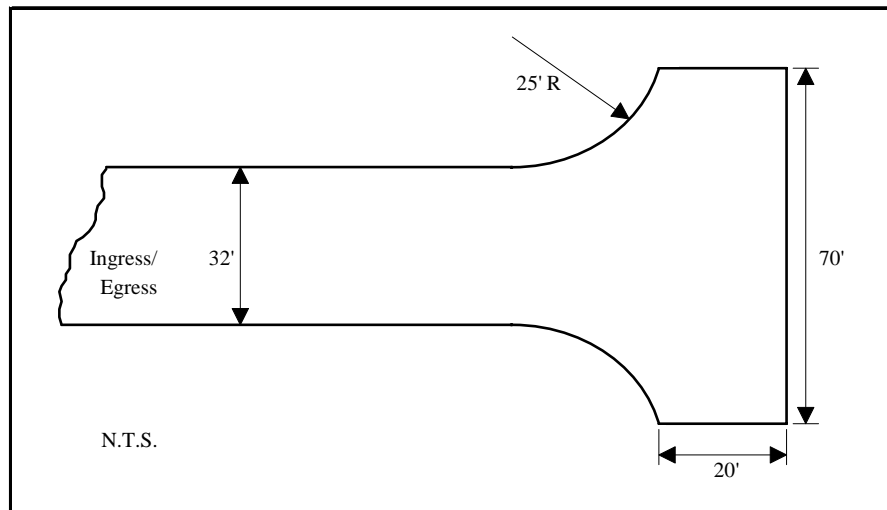


Figure 4-3

B. Cul-de-sacs

Cul-de-sacs shall be constructed where a dead end street will serve five (5) or more residential lots.

Cul-de-sacs shall be designed to meet the minimum requirements set forth in the Public Works Standard Plan No. DR-06 as found on the govME website under document

information, standard plans. The construction of an inner curb as shown on the standard plan is an option, although not recommended.

Cul-de-sacs are primarily constructed as permanent improvements in City of Tacoma right-of-way, where the future extension of the street is not likely.

C. Barricades

Barricades with reflectors conforming to the Public Works Standard Plan No. SU-13 shall be provided at dead ends. Two (2) feet of clearance between the limits of the street improvements and the barricade, shall be maintained.

In areas where extreme slopes or other hazards exist, a Type 2 Concrete Barrier (WSDOT/APWA Standard Plan C-8) with reflectors may be utilized.

Barricades or posts may not be required where a private driveway accesses the dead end street through the end of the street or turn-a-round.

4.070 Pedestrian Facilities

All pedestrian facilities as outlined in this section shall be in compliance with the American Disabilities Act (ADA) requirements.

A. Sidewalks

The City standard sidewalk section provides for a planter strip measuring five (5) feet from the face of curb to the front of walk. The standard sidewalk measures five (5) feet from front of walk to back of walk.

In residential areas where limited right-of-way or existing features do not allow for a standard sidewalk section, the planter strip width may be reduced on a case by case basis.

Adjacent to arterials, commercial development, or in areas of high pedestrian traffic, seven foot combination walk shall be required, where a standard sidewalk section is not practical. Seven foot combination walk shall measure seven (7) feet from the face of curb to the back of walk.

B. Curb Ramps

All curb ramps shall be constructed in accordance with the current ADA requirements. ADA requirements can be found in the Federal Register.

Curb ramps shall be located at all intersections, for all pedestrian crossing paths unless directed otherwise by the City of Tacoma Public Works Department. Two curb ramps shall be provided for a standard street corner. A single diagonally positioned curb ramp may be allowed if topography and/or presence of other utilities make double ramps on the corner impractical. The contractor shall contact the City of Tacoma Construction Inspector for approval of curb ramps prior to staking.

Curb ramps to be constructed at a standard street corner shall conform to Public Works Standard Plans No. SU-05 and No. SU-05A (Appendix A). Curb ramps to be constructed mid-block (i.e. the top of a 'T' intersection) shall conform to Public Works Standard Plan No. SU-05 and SU-05A (Appendix A).

C. Curb Bulbs

A curb bulb provides a shorter pedestrian crossing and allows a better range of vision for a pedestrian while helping to define the on-street parking limits. The use of curb bulbs will be considered / required by the City of Tacoma Public Works Department on a case by case basis.

4.080 Monumentation

All new/replaced monuments constructed in a street section shall be a Poured Monument (Ref. Standard Plan No. SU-01 -- Appendix A). Monuments shall be constructed within the limits of the permanent street improvements (located within the right-of-way) as follows:

- At the intersection of any two monument lines.
- At the intersection of any monument line and any section line or quarter section line.
- At the beginning and end of a horizontal curve where the point of intersection of the curve is not located within the pavement section.
- At the point of intersection of a horizontal curve where the point of intersection of the curve is located within the pavement section (excluding the curb and gutter).
- At any horizontal angle point of the monument line.
- Engineers are reminded their projects must comply with WAC 332-120 regarding locating all known survey monuments, including property corners, within the project limits. No survey monument may be removed without a permit being obtained in advance from the State Department of Natural Resources, and later, replacing the monument.

4.090 Additional Street Design Considerations

A. Walls

Where a wall supports fill from entering onto the right-of-way, the wall shall be placed no closer than two (2) feet from the back of the walk or future walk. In areas where a wall will be placed to support the right-of-way, care should be taken by the engineer to provide measures that will assure the safety of both traffic and pedestrians.

Rock walls are designated as a protective facing to enhance the resistance of an exposed cut or fill face to weathering and erosion. While a rock wall possesses some undetermined retention qualities due to the mass, size and shape of the rocks, it is not to be used in place of an engineered retaining wall. Under no circumstances shall a rock wall be constructed to support a surcharge from adjacent improvements. Where the wall will not be affected by a surcharge, a rock wall may be constructed up to a height of four (4) feet without a permit or design. Rock walls over four (4) foot in height shall conform

to the *Standard Rock Wall Construction Guidelines* by the Associated Rockery Contractors (ARC). An online copy is available at www.ceogeo.com/are-2.htm

In areas where a wall will be supporting a surcharge from adjacent improvements, an engineered retaining wall will be required based on the following loadings:

Street: H-20

Sidewalk: 250 lbs/ft²

Concentrated Load: 8,000 lbs

Concentrated loading for sidewalks shall be distributed as specified in Table 1607.1 of the 2003 International Building Code.

B. Fences, Handrails, Guardrails

Fences, handrails, and guardrails should be constructed no closer than two (2) feet from the back of walk, the future back of walk, or the edge of the roadway.

C. Mailboxes (Post Office Contact)

The applicant must contact the United States Post Office serving the area in order to determine the requirements in regards to mail box access for the development. In some instances, the design of the street section will be affected by the requirements set forth by the Postmaster General. In areas of combination walk where mailboxes are required to be adjacent to the street, the design should reflect the requirements of Standard Plan No. SU-06. In areas where a Neighborhood Delivery and Collection Box Unit (NDCBU) are required, the engineer should refer to the Postmaster General.

Chapter 5

Storm and Sanitary Design

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5.010 Storm and Sanitary Sewer General Design Requirements

A. Record Drawings

Record drawings for City streets and sewers owned and maintained by the City can be viewed online at www.govme.org. City street and sewer record drawings can also be printed from this website. Record drawings can be viewed electronically at the Public Works Department Information Center, located on the third floor of the Tacoma Municipal Building, 747 Market Street. Prints of the record drawings may be purchased at the Information Center.

B. Capacity Analysis

A capacity analysis may be required for existing storm and sanitary sewer mains and/or pump stations depending on the potential development impacts. Any modifications to City system grades or lengths shall require accompanying design calculations to verify capacity of the City system has not been impacted. Contact Public Works Environmental Services at 253-591-5588 to determine if a capacity analysis of the storm or sanitary system is required for the work order.

Note: The Surface Water Management Manual gives further guidance on when capacity analysis are required for storm sewers as part of a development project. This analysis is also known as a 1/4-mile downstream analysis or an off-site analysis.

Note: The Department of Ecology's Criteria for Sewage Works Design gives further guidance on determining capacity of sanitary sewer mains.

C. Main Design

Any extension of a City storm or sanitary sewer main greater than eight (8) inches in diameter will require an environmental checklist. Refer to Chapter 9 for additional information regarding the environmental checklist.

Storm Sewers:

Please refer to the City of Tacoma Surface Water Manual, Volume III, and Chapter 4.

Sanitary Sewers:

The slope of sanitary sewer mains shall not be less than one (1) percent. Where deviating from this standard, calculations shall be provided showing that the proposed system meets or exceeds a two (2.0) feet per second scouring velocity. The minimum pipe diameter for sanitary mains is eight (8) inches. The distance between manholes should be approximately 300 feet. Lengths up to, but not exceeding, 350 feet may be considered on a case-by-case basis.

D. Main Depth

The standard depth for new storm and sanitary sewer mains shall be as shown in Public Works Standard Plans No. DR-04 and No. DR-05.

Existing conditions may necessitate a deviation from the standard; however, the engineer is encouraged to investigate alternative routes for connection before requesting such a deviation in depth. Deviations from the depth standard will still be required to meet other required minimums for slope, size and flow. The engineer shall take into consideration the potential for future extensions of the storm and sanitary sewer systems. This may alter the design and depth of the system.

The engineer should calculate suitable pipe cover for an HS-20 loading over pipes installed in areas subject to vehicular traffic. The minimum cover for all pipe materials is three (3) feet in areas of vehicular traffic unless the Engineer provides verifying calculations to confirm the adequacy of the selected pipe's strength for the burial condition.

E. Alignment

The standard alignment for mains is shown on Public Works Standard Plans No. DR-04 and No. DR-05 (Appendix A). Where the engineer must deviate from the standards due to existing conditions (i.e. conflicting location of existing utilities) every attempt should be made to get the storm back on the standard alignment. In these cases, the minimum spacing between various utilities shall be maintained as outlined in this section.

The relationship of the alignment of a main entering to a main exiting a manhole should not be less than 90 degrees, as shown in Figure 5-1.

Where crossing an existing or proposed utility, the alignment of the storm or sanitary system should be such that the two systems cross as close to perpendicular as possible.

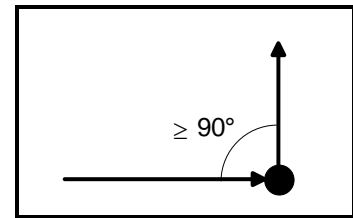


Figure 5-1

Where the vertical separation of two parallel systems exceeds the horizontal separation, additional horizontal separation may be required to provide future access to the deeper system.

F. Casings

Casings shall be required for all pipes when the depth of fill, adjacent improvements or structures, heavy traffic or any other considerations will exist which would make conventional open trench replacement or repair work impractical. Some examples of improvements that would require a casing for sewer and/or storm utilities would be: railroad, freeway, building, bridge abutment, retaining wall, structural slab, Utilidor, etc.

- Casing material and joints shall be ductile iron or steel able to withstand the anticipated loadings.
- Casing inside diameter shall be, at a minimum, thirty-three (33) percent greater than the outside diameter of the carrier pipe or two (2) standard pipe diameters larger than the carrier pipe, whichever of the two is greater. However, casings may need to be larger due to anticipated future upsizing of sewer systems. Actual

casing sizes will be specified by Environmental Services, Science & Engineering Division.

- Casing material shall be leak proof and an analysis shall be performed to determine if cathodic protection or an increase in thickness is necessary to guarantee the pipes will not deteriorate over 100 years.
- All casing pipe welds shall be inspected by a third party testing agency, including both 100 percent visual weld inspection and using a non-destructive testing method recommended by the testing agency.
- The ends of the casing pipe shall be sealed to prevent entry of water.
- The casing will extend to a point outside the loading zone of influence.
- Pre-manufactured non-metallic or non-corrosive casing spacers, adjustable runners, or cradles shall be used to support the carrier pipe in the casing to facilitate pipe removal/installation and to prevent vertical movement of the carrier pipe. Spacing devices shall be selected and installed in accordance with the spacer manufacturer's recommendations.
- In addition to the spacers, the annular space between carrier pipe and casing shall be filled as specified by Environmental Services, Science and Engineering Division.

G. Manholes

1. Where Required

Manholes shall be required as follows:

- At the intersection of any two sanitary sewer mains or any two storm mains.
- At the dead end of a sanitary or storm main.
- At alignment or grade changes.
- Where connecting a catch basin lead to a storm main.
- Such that the maximum allowable main length as defined by this chapter is not exceeded.

1. Manhole Types

All manholes shall either be Type I or II with concentric cones, conforming to the Public Works Standard Plans No. SU-17 and No. SU-18 (Appendix A). The use of Type III manholes requires prior approval.

2. Manhole Covers

All manhole frames and covers shall conform to Public Works Standard Plan No. SU-22 (Appendix A).

All manholes located in sidewalk sections shall have a solid locking cover. The sidewalk section shall be a minimum of six (6) inches thick in the vicinity of the manhole.

Other manholes needing solid locking covers may be identified through the Work Order review process on a case-by-case basis. Examples of where these might be

required are in gulches, undeveloped right of ways, low drainage areas (to prevent inflow of storm water), etc.

4. Connections to Manholes

Where connecting two or more mains of equal size to a manhole, the invert elevations of the upstream pipes shall be a minimum of 0.1 foot higher than the invert elevation of the downstream pipe.

Where connecting two or more mains of different diameters, the invert elevations shall be located such that the crown of all of the pipes are at the same elevation (refer to Figure 5-2).

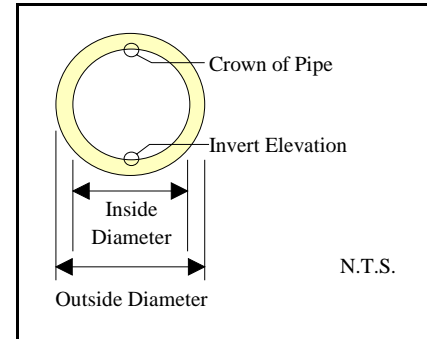


Figure 5-2

The bases of all manholes shall be channeled in accordance with Public Works Standard Plans No. SU-17 and No. SU-18 (Appendix A). City manholes do not have sumps. Drop connections will not be allowed, unless otherwise approved by the City Engineer.

The engineer should verify that the manhole diameter is large enough to accommodate all existing and proposed pipes without jeopardizing the integrity of the manhole.

A flexible pipe-to-manhole connector shall be employed in all connections of rigid and flexible (thermoplastic) pipes to new precast concrete manholes to provide a watertight joint between the pipe and the manhole. The connector shall be “Kor-N-Seal” with “Wedge Korband”(Type I or II as required for pipe diameter), manufactured by NPC, Inc., Milford, New Hampshire, or Engineer approved equal. The connectors shall be installed in accordance with the manufacturer’s recommendations.

H. Conveyance Pipe Materials and Installation

1. Acceptable Pipe Materials

The following table describes the acceptable pipe materials for storm and sanitary sewer mains.

Table 5-1 -- Acceptable Pipe Materials

Pipe Material	Reference	Section in WSDOT/APWA Standard Specifications	Approved Use
PVC Ø≤15”	ASTM D 3034 - SDR 35	9-05.12	Storm, Sanitary
PVC Ø 18 - 27”	ASTM F 679 - Type 1	9-05.12	Storm, Sanitary

AWWA C900 PVC pipe	AWWA C900	9-30.1(5)A	Storm, Sanitary
Plain Concrete	AASHTO M86, Class 2	9-05.7(1)	Storm
Reinforced Concrete	AASHTO M170	9-05.7(2)	Storm
Ductile Iron	ANSI A21.51 or AWWA C151	9-05.13	Storm
Lined Ductile Iron	ANSI A21.51 or AWWA C151	N/A	Sanitary (Upon approval)
Solid Wall HDPE Pipe	ASTM D3350,	N/A	Storm, Sanitary (Upon approval)

1. Pipe Bedding

Pipe bedding shall conform to Public Works Standard Plan No. SU-16 (Appendix A).

2. Pipe Anchors

The following table shows criteria to be used in determining whether pipe anchoring is required.

Table 5-2 -- Pipe Anchor Requirements

Pipe Material	Pipe Slope Above Which Pipe Anchors Required and Minimum Anchor Spacing	Maximum Slope Allowed	Maximum Velocity at Full Flow
*PVC	20% (1 anchor per 100 L.F. of pipe)	30% ***	30 fps
*Concrete	10% (1 anchor per 50 L.F. of pipe)	20% ***	30 fps
Ductile Iron	40% (1 anchor per pipe section)	None	None
**HDPE	50% (1 anchor per 100 L.F. of pipe - cross slope installations only)	None	None
*	Not allowed in landslide hazard areas.		
**	Butt-fused pipe joints required. Above-ground installation is required on slopes greater than 40% to minimize disturbance to steep slopes.		
***	Maximum slope of 200% allowed for these pipes with no joints (one section) with structures at each end and properly grouted.		

I. Separation From Other Utilities

Storm Sewers:

A minimum of five (5) feet horizontal separation should be maintained between all storm sewers and any other existing utilities. The distance between utilities shall be measured from edge of pipe to edge of pipe.

Sanitary Sewers:

A minimum of five (5) feet horizontal separation should be maintained between all sanitary sewer mains and any other existing utilities, except potable water.

A minimum of ten (10) feet horizontal separation and eighteen (18) inches vertical separation should be maintained between all gravity sanitary sewers and potable water lines. (See Figure 5-3)

Gravity sanitary sewer lines not meeting the minimum separation requirements and all pressurized sanitary sewer lines shall be designed in accordance with the Department of Ecology's Criteria for Sewage Works Design.

The distance between utilities shall be measured from edge of pipe to edge of pipe.

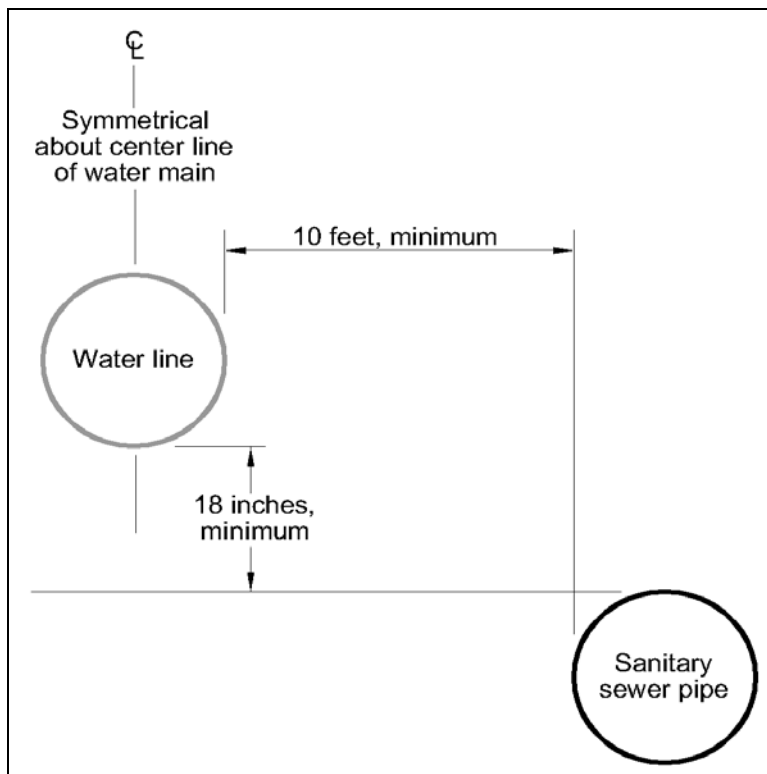


Figure 5-3

5.020 Storm Systems

A. Surface Water Management Manual

This section contains a summary of the City's Surface Water Management Manual, which is considered a part of this manual. Copies of the Surface Water Management Manual can be purchased from the Public Works Building and Land Use Services Division, located on the third floor of the Tacoma Municipal Building at 747 Market Street, 253-591-5030. An online PDF version of the manual is available on the internet at the City of Tacoma, Environmental Services web page:

<http://www.ci.tacoma.wa.us/waterservices/permits/>

The manual consists of 5 volumes:

Volume I – Minimum Technical Requirements and Site Planning
Volume II – Construction Stormwater Pollution Prevention
Volume III – Hydrologic Analysis and Flow Control Design/BMPs
Volume IV – Source Control BMPs
Volume V – Runoff Treatment BMPs

Volume I of this manual describes the geographical areas to which the manual applies, serves as an introduction and covers several key elements of developing the Stormwater Site Plan. Volume I also establishes the Minimum Requirements for New and Redevelopment projects;

Volume II covers BMPs for short-term storm water management at construction sites;

Volume III covers hydrologic analysis and BMPs to control flow volumes from developed sites;

Volume IV addresses BMPs to minimize pollution generated by potential pollution sources at developed sites; and

Volume V presents BMPs to treat runoff that contains sediment or other pollutants from developed sites.

Projects that follow the Surface Water Management Manual will apply reasonable BMPs to reduce adverse impacts to stormwater. This manual is applicable to all types of land development – including residential, commercial, industrial, and roads.

1. **Best Management Practices** (BMPs) are defined as schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters and the City system. The primary purpose of using BMPs is to protect beneficial uses of water resources through the

reduction of pollutant loads and concentrations, and through reduction of discharges (volumetric flow rates) causing stream channel erosion or flooding to the City system.

The manual focuses on BMPs for four primary areas of concern: Construction Storm Water Pollution BMPs, Source Control BMPs, Treatment BMPs and Flow Control BMPs.

a. Construction Stormwater Pollution BMPs:

Construction stormwater pollution control (erosion and sediment control) is required on all sites to prevent sediment from leaving the construction site, contaminating surface water, and impacting habitat. Some temporary erosion and sediment control measures include protection of storm line catch basins/inlets, dust control, stockpile management, restrictions on open trenching, land clearing activities, and construction entrances.

b. Source Control BMPs:

Source control BMPs **prevent or reduce** pollution, or other adverse effects of storm water, from occurring. It is generally more cost effective to use source controls to **prevent** pollutants from entering runoff, than to treat runoff to remove pollutants.

c. Treatment BMPs:

Water quality treatment BMPs prevent or reduce sediments, heavy metals, petroleum products (oils) and nutrients such as nitrogen and phosphorus. These contaminants to surface water or groundwater can cause habitat degradation.

d. Flow Control BMPs:

Water quantity (flow control) BMPs prevent flooding, property damage and habitat degradation. Flow control requirements vary depending upon where the storm water is discharged. Flow control is required when the water discharges to freshwater, gulch, erosion hazard area, or to an identified capacity problem in the City system.

Flow control is not usually required when the stormwater is discharged directly to Puget Sound if there is capacity in the City system. Direct discharges to the Sound can be impeded by tidal influences, which in turn would diminish capacity in the system. During periods of very high tides, portions of the City's conveyance system may not have the capacity to handle additional stormwater.

1. Minimum Requirements:

The Minimum Requirements contained within the manual apply to all new development and redevelopment projects, as established by specific thresholds in the manual. Not all of the Minimum Requirements apply to every development or redevelopment project. The applicability varies depending on the type and size of the

project. Section 3.4 of Volume I identifies thresholds that determine the applicability of the Minimum Requirements to different projects. The flow charts in Figures 3-2 and 3-3 of Volume I can also be used to help determine which requirements apply. All projects should start with Figure 3-2. The Minimum Requirements themselves are presented in Section 3.5.

Most new streets and roads will have to comply with some of the Minimum requirements of the Surface Water Manual. Storm Water Site Plans and Construction Stormwater Pollution Prevention Plans are required for these projects. Public works and private sector road projects completely within the right of way that do not add or replace impervious surface are exempt. An example of this type of project would be a street overlay.

2. Ecology Construction NPDES Permit:

Construction projects that create more than 1 acre of land disturbing activities are also required to get a National Pollutant Discharge Elimination System (NPDES) permit from the Washington State Department of Ecology (DOE). Information relating to these permits can be obtained by contacting the Department of Ecology Permit Assistance Center at 1-800-917-0043.

Please refer to the Stormwater Management Manual for further information on these topics and for information on submittal requirements for Stormwater Site Plans and Construction Pollution Prevention Plans (formerly known as Drainage and Erosion Control Plans).

B. Storm Calculations, Treatment, and Flow Control (Detention)

The engineer should refer to the City of Tacoma Surface Water Management Manual for criteria relating to the creation of storm calculations and/or the design of stormwater facilities.

C. Private Drainage

All private drainage systems for plats and short plats shall be submitted via the work order process. Private drainage systems shall be clearly labeled on work order plans as private, and de-emphasized by using lighter line weight and smaller fonts. Private drainage systems are reviewed by the Public Works Environmental Services Science and Engineering Division. The engineer is responsible for the coordination of private storm drainage with other potentially conflicting improvements.

Private storm systems collecting storm water from private roads serving five (5) or more lots shall be designed and constructed in accordance with City standards. Private storm systems collecting storm water from private access ways serving four (4) or fewer lots may utilize catch basin-to-catch basin connections

The engineer should refer to the conditions placed on the subdivision as part of the land use permitting process as well as the City of Tacoma Surface Water Management Manual for additional criteria relating to the design of private storm systems.

D. Catch Basin and Catch Basin Leads

The engineer should refer to the City of Tacoma Surface Water Management Manual, Volume III, Chapter 4, for criteria for catch basin and catch basin lead requirements.

Where connecting private drainage systems or other instances where multiple pipes are connected to a common catch basin, the engineer should verify that the invert elevations are not in conflict with the knockouts (as shown on WSDOT/APWA Standard Plan B-1).

5.030 Sanitary Sewer Systems

A. Sanitary Laterals

This section pertains to the portion of the lateral that is contained within City right of way or City easements. The portion of laterals contained on private property shall conform to the Uniform Plumbing Code.

Pipe materials, bedding, and anchoring for laterals shall conform to section 5.010(H) of this chapter.

The sanitary lateral must be a minimum of six (6) inches in diameter and placed at a minimum two (2) percent slope. A cleanout shall be installed in each lateral in accordance with Public Works Standard Plan No. SU-24 (Appendix A).

A lateral stub-out shall be constructed five (5) feet into the private property beyond the right-of-way limits, the easement, or the common utility trench, where applicable. During construction, the location of the stub shall be marked with a white 2x4 stake with the depth to the stub indicated on the stake. A locating wire shall be provided to extend from the stub to the stake at ground level. The locating wire shall not be attached to the stake.

The proposed connection to the building should not be shown on the work order plans. Private connections to the sanitary lateral will require a separate side sewer connection permit.

The depth of the lateral at the right-of-way should be a minimum of five (5) feet below final grade.

In the event that a main will not be extended in the future, no more than two (2) laterals may be connected to a dead end manhole. No drop connections into manholes will be permitted unless otherwise approved by the City.

B. Private Pump Systems

Private pump systems are not permitted without prior approval and only when gravity service has been shown to be infeasible due to site constraints.

Private pump systems shall be designed in accordance with the City's private pump system checklist and standard details. The design shall be submitted for review and accepted prior to receiving a side sewer permit. For more information regarding private pump systems or to receive a copy of the design checklist and standard details, contact the Environmental Services Science and Engineering Division of the Public Works Department at 591-5588.

Chapter 6

Streetlighting

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6.010 Streetlighting

Streetlighting is required for all new plats in accordance with section 13.04.165 of the Tacoma Municipal Code, which reads as follows:

Streetlights shall be installed throughout the plat in accordance with the Illuminating Engineering Society (IES) Standards. The minimum requirement for full lighting shall be for intersection, mid-block, and cul-de-sac lighting. Maximum spacing of streetlights at a 30-foot mounting height shall generally be 150 feet to 200 feet, subject to approval by the City Engineer.

In other land use actions, such as re-zones, the City of Tacoma Public Works Department may determine that streetlighting is required to mitigate impacts of new developments due to high vehicular or pedestrian volumes, street alignment and grade, safety related problems, etc. In these cases Public Works would recommend that the Hearing Examiner (or the Land Use Administrator) require streetlights through the conditions.

Typical requirements for new developments based on street/land use classification are as follows:

- New developments on arterial streets shall be required to install new streetlights or upgrade existing streetlights to current standards
- Low-density residential short plats are not generally required to install streetlights. Where new street frontage is being installed, conduit only for future streetlighting shall be required.
- High-density development on non-arterial streets shall be required to install new streetlights or upgrade existing streetlights to current standards when recommended by the City Engineer.
- High density and/or commercial developments shall be required to install streetlight or upgrade existing streetlights to current standards when recommended by the City Engineer.

6.020 Streetlighting Work Order Process

Where required by the conditions of the Hearing Examiner or Land Use Administrator, a streetlighting work order shall be set up through the Public Works Engineering Division, Traffic Engineering section. It is incumbent upon the applicant or engineer to contact Traffic Engineering to set up the street lighting work order. Final plat approval is dependent upon completing all construction including streetlighting.

A. Initiation of the Streetlighting Work Order

Once the applicant has contacted the City and provided an acceptable site plan to the Engineering Division, the City will perform a preliminary study of the streetlighting for the development. The City will then provide a letter to the applicant with an estimation of the anticipated engineering and inspection costs expected to be incurred by the City.

No further action will be taken by the City, until the applicant remits the estimated funds. It should be noted that if the project costs exceed the estimated deposit the applicant will

be billed accordingly. If the account is in good standing, the applicant will be refunded the excess.

B. Streetlighting Design

The City will prepare a design and provide the applicant with a reproducible copy of the plans, standard drawings and specifications, as well as provide for inspection during construction by the City's streetlight inspector. Upon final inspection and acceptance by the City, the streetlight system will become the property of the City and will be operated and maintained by the City.

C. Construction

The applicant will be responsible for obtaining a contractor for the installation of the streetlights. The applicant will also be responsible for project management; including scheduling and coordinating work between the various contractors and utilities. Additionally, the applicant shall be responsible for coordinating the location of underground utilities and identifying conflicts in the location of these utilities.

For the use in processing a construction contract for streetlighting, the applicant will receive from the City a copy of the specifications, a copy of the reproducible plans, standard drawings, and a project flow chart similar to that found on the following page.

The following requirements must be satisfied by the contractor prior to commencing work:

- A "No Fee" special construction permit shall be obtained from the permit counter, Building and Land Use Services Division.
- An electrical permit shall be obtained from Tacoma Power.
- A current street obstruction bond must be on file with the Public Works Permit Counter.
- Notification shall be made to the City Signal/Streetlight Supervisor.
- The contractor shall submit request for material approval to:
Engineering Division, Traffic Section
Department of Public Works

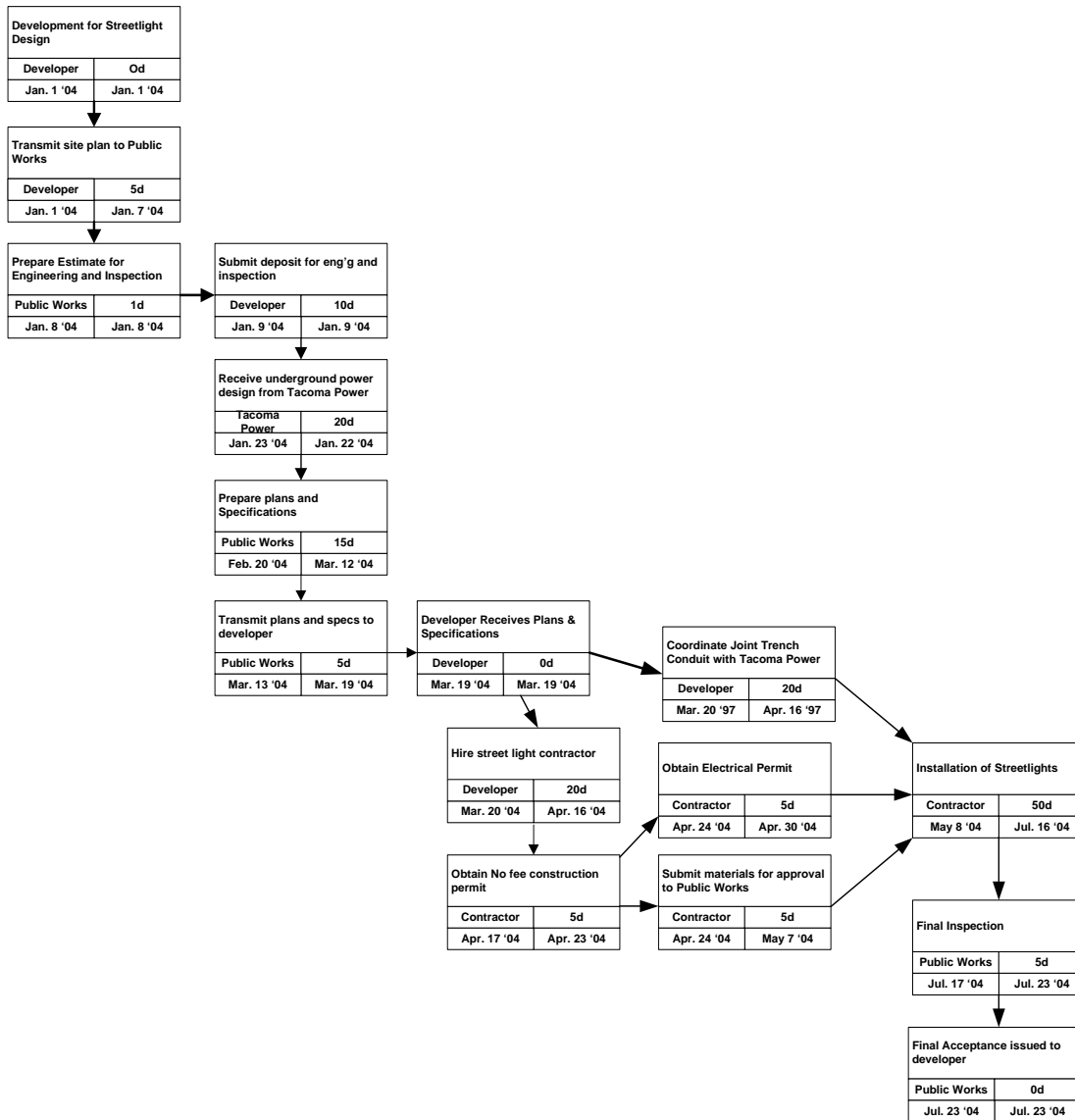
D. Inspection

The contractor shall notify the City Streetlight Supervisor at the following stages of construction for inspection of the work.

- Before beginning of work the City will locate all streetlights and junction boxes. The contractor is responsible for determining proper grades.
- Before conduit is buried
- Before pouring streetlight foundations
- When construction is complete and ready for final inspection

Streetlighting Flow Chart

Streetlighting Flow Chart



E. Project Completion

Upon completion of the streetlight construction, the City will notify the applicant that the final inspection has passed and that the City has found the streetlighting complete and operational. At this time, the City will accept the streetlights, which will be operated and maintained by the City.

F. Common Misconceptions

The streetlighting work order process is a distinct and independent process.

F. Common Misconceptions

The streetlighting work order process is a distinct and independent process.

The streetlighting process is not included when the developer pays City Light for the extension of power lines to serve the site. Also, the streetlighting work order is not initiated automatically when the street, storm, and/or sanitary work order is initiated.

The report from the Hearings Examiner or Land Use Administrator is quite clear on the procedure for setting up a streetlighting work order. Furthermore, typically the first redlined check print of the street, storm, and/or sanitary work order contains a comment regarding the initiation of the required streetlighting work order. It is then incumbent on the applicant to initiate the streetlighting work order. After reminding the applicant on the first check print, subsequent check prints will not follow up on this responsibility of the applicant.

Final plat approval is based on completion of the streetlighting.

6.030 *Streetlighting Standard Plans*

City of Tacoma Standard Plans relating to streetlighting are included for informational purposes only in Appendix A. All applicable notes and details will be included on the construction plans.

Chapter 7

Traffic Signalization

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7.010 Traffic Signalization Work Order Process

The work order process for traffic signalization is a separate and distinct process from the work order process for street, storm, and sanitary improvements as outlined in Chapter 2.

A. Initiation of the Traffic Signalization Work Order

A requirement for a traffic signalization work order will be identified in the conditions of the Hearing Examiner or Land Use Administrator where applicable. Specific direction will be provided to the applicant as to the proper contact in the Traffic Engineering Section of the Engineering Division. The City requires the establishment of a work order prior to the review and approval process of privately designed plans for the construction of City owned facilities. The Work Order process requires that the applicant deposit funds with the City in the amount estimated to cover City costs accrued during the review process and construction of the project.

The City will provide the applicant with a letter containing an estimate for the plan review, the construction inspection and the testing of the finished product. It will be necessary that the estimated funds to cover the plan review be deposited with the City prior to, or at the time of, plan submittal. The deposit is to be made at the Building and Land Use Services, Permit Counter on the third floor of the Tacoma Municipal Building. The remaining amount may be delayed until construction begins but must be deposited prior to issuance of Construction permits for the work.

The amounts indicated in the letter to the applicant are estimates only; actual charges will be accumulated. At the conclusion of the project, any excess funds will be refunded. If additional funds are necessary, the applicant will be so notified and billed accordingly.

B. Review and Approval Process

The applicant shall schedule a pre-design meeting with the Traffic Engineering Section to review specific traffic signalization design requirements.

The applicant shall submit plans and specifications to Traffic Engineering for review. Design comments will be returned to the applicant. The applicant shall submit an approved design on mylar, stamped and signed by a Washington State Professional Engineer, for signature by City's Traffic Engineer. The City will retain all original plan sheets and will return a reproducible copy to the applicant.

C. Construction and Inspection

A City Traffic Signal Inspector will be assigned to inspect the traffic signalization project. The Traffic Signal Inspector will assist the City's Construction Division Inspector. All signal equipment shall be field located by the Traffic Signal Inspector.

Controller equipment purchased by the applicant shall be delivered to the City's signal shop for testing prior to installation.

D. Project Completion

The applicant shall warranty all electrical and mechanical equipment and strain poles and streetlight standards for satisfactory in service operation for one year following project acceptance. Warranty shall include troubleshooting, labor, materials and all other costs to bring the equipment to a satisfactory level of service. Normal maintenance is not included in the warranty.

7.020 Traffic Signalization Plans

The engineer should refer to Chapter 3 for general requirements regarding the plan format.

Plan sheets for a traffic signalization work order shall show all existing features and identify all pavement removal. The plans shall provide a traffic signalization plan and show all applicable details on the plan. The plan shall also provide a signal schematic and a wiring schedule.

7.030 Signalization Design

The design and construction of traffic signalization in the City shall be consistent with WSDOT/APWA State Standard Specifications as amended by the City of Tacoma, the Signalization Standard Plans as found in the back of this chapter, the MUTCD, and AASHTO *Policy*. Construction and material details concerning signalization design are contained in section 8-20 and 9-29 of the WSDOT/APWA State Standard Specifications as amended by the City of Tacoma.

A. Standard Design

The standard traffic signal design consists of steel strain poles with luminaire mast arms and with vehicle signal heads installed on span wire or mast arm.

Traffic signal strain poles, mast arms and pedestals shall be designed to conform to the latest AASHTO *Policy*, Section 9-29.14 of the City of Tacoma Master Specifications, and all applicable City Standard Plans.

Traffic signal heads shall conform to Section 9-29.16 of the WSDOT/APWA Standard Specifications as amended by the City of Tacoma Master Specifications, and all applicable City Standard Plans. The City of Tacoma Master Specifications are not presently available online, however each chapter of the Specifications has been saved as a Microsoft Word document. To obtain an electronic copy of any chapter of the City of Tacoma Master Specifications, contact the Construction Division at (253) 591-5765. Traffic signal heads shall be located according to the MUTCD and City of Tacoma Standard Plan TS-14 as found at the end of this chapter.

Vehicle detection loops shall be designed to conform to City Standard Plan TS-11.

The traffic signal controller and controller cabinet shall meet the City specifications required for each location. Specifications will be provided to the engineer. The City will

perform equipment testing and all controller cabinet field wiring at the expense of the project.

B. Conduit and Junction Box Design

All traffic signal conduit shall be two (2) inch and all streetlight conduit shall be 1¼ inch. Conduit installed under streets and commercial driveways shall be PVC Schedule 80. Conduit installed behind the sidewalk shall be PVC-40. Refer to Section 8-20.3(5) of the City of Tacoma Master Specifications.

Install four (4), two (2) inch traffic signal conduits and one (1), 1¼ inch streetlight conduit for each street crossing.

Conduits installed within a paved roadway area shall be installed in trenches backfilled with Controlled Density Fill (CDF) as specified in Section 8-20.3(5) of the City of Tacoma Master Specifications.

Junction boxes shall meet the requirements of Section 9-29.2 of the WSDOT/APWA Standard Specifications and City Standard Plan TS-08. Standard size junction boxes and lids shall be compatible with Fogtite B-9 boxes and large size junction boxes and lids shall be compatible with Fogtite B-10 boxes. The maximum number of conduits installed in a standard junction box shall be five (5) and in a large junction box the maximum number of conduits shall be nine (9).

Standard size junction boxes shall be installed at the base of the pole for all service riser assemblies. Additionally, ground rod boxes are required for service riser assemblies. Standard size junction boxes shall also be installed at the base of the pole for a communication riser assembly prior to entering the controller foundation due to the length of the run and/ or drainage considerations.

C. Wire Specifications

All traffic signal and streetlight conductors and cable shall meet the requirements of Section 9-29.3 of the WSDOT/APWA Standard Specifications as amended by the City of Tacoma Master Specifications. Traffic signal controller service wire and streetlight wire may share a conduit and junction box. Five conductor cable for traffic signal heads shall run in separate conduit and junction boxes from low voltage traffic signal cable. Low voltage traffic signal cable consists of detection cable, interconnect cable, and five conductor pedestrian push button cable. A separate traffic signal ground wire shall run between each strain pole and the controller cabinet.

7.040 Standard Plans

See Appendix A for City of Tacoma Standard Plans relating to Traffic Signalization.

Chapter 8

Channelization/Pavement Marking

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8.010 Process

Unlike many of the other processes described in this manual, the process for the design relating to the channelization and pavement marking is typically included as a part of another process.

If a traffic signalization work order is required, the plans for the design of the channelization and pavement marking are typically included with the plans for the traffic signalization. Where a traffic signalization plan is not required, the design of the channelization and pavement marking may be included with the private work order for street improvements.

8.020 Plan Format

The engineer should refer to Chapter 3 for the standard requirements relating to the plan format. Again, the plans should stand on their own, with enough information to construct the stated improvements. All items relating to channelization and pavement marking should be clearly labeled and identified.

8.030 Design Guidelines

All new arterial construction shall include all necessary lane lines, stop bars, legends, crosswalk marking and other necessary markings. Lane lines shall consist of both paint and raised pavement markers. Stop bars, crosswalk stripes, legends and other markings shall consist of plastic material. Pavement markings shall be designed in accordance with Section 8-22 of the WSDOT/APWA Standard Specifications, City of Tacoma Standard Plans, and the MUTCD.

8.040 Construction Requirements

As dictated by the design, the installation of pavement markings shall be in accordance with Section 8-22 of the WSDOT/APWA Standard Specifications, City of Tacoma Standard Plans, and the MUTCD.

All pavement markings in areas where new channelization transitions into or replaces existing channelization or pavement markings shall be removed. Removal of both painted and raised pavement markers shall be required as specified in Section 8-22.3(7) of the WSDOT/APWA Standard Specifications.

When work is performed in the roadway, traffic control devices shall be installed to warn and protect the public at all times. The City requires that all flagging, signs and all other traffic control devices conform with Section 1-07.23 and 1-10 of the WSDOT/APWA Standard Specifications. Construction traffic control shall also conform with the current edition of the MUTCD (Part VI). Refer to Section 9.060 for additional traffic control requirements.

8.050 Channelization Details

Included on the following pages are details relating to channelization design.

- Channelization Details - Raised Pavement Markers and Paint Striping
- Typical Crosswalk and Stop Bar Locations
- Pavement Markings (See WSDOT Standard Plan H-5c)

* See Section 3B of the MUTCD for arrows and ONLY plans

Chapter 9

Miscellaneous Topics

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9.010 Building Permits/Commercial Development Plans

The building permit process is a separate and distinct process from the work order process. In many cases, the approved commercial development plan which has undergone the commercial plan review process, will indicate that a work order must be set up for street frontage/sewer improvements. It is important that the applicant begin the work order process as soon as possible, in that it can be a fairly lengthy process.

9.020 Private Property Construction Permit

The private property construction permit form shall be completed for each adjacent private property impacted by the project prior to work order approval. Adverse impacts to properties include, but are not be limited to, discontinuity in grade, abrupt meet lines, access to driveways and garages, and drainage problems created or intensified as a result of the project. Measures taken to resolve adverse impacts shall be shown on the project construction drawings. Unless otherwise agreed upon, slopes shall be constructed using cuts and fills no steeper than 2H:1V. Where sidewalks are not being constructed, a graded pedestrian walk area shall be provided at a 2 percent slope immediately adjacent to the roadway. **It is the engineer's responsibility to identify and resolve adverse impacts to affected properties prior to release of construction plans.**

At the bottom of the private property construction permit, there is an opportunity for the engineer to sign and return the permit, if it is the engineer's opinion that there will be no adverse impacts to adjacent properties.

A copy of the private property construction permit is provided at the end of this chapter.

9.030 In Lieu of Assessment Release Form

When extending the "Municipal Sewer System" (a sanitary sewer main), an In Lieu of Assessment Release Form shall be completed and returned to the City of Tacoma LID Section of the Public Works Department, prior to work order approval. The form is necessary to waive the "Connection Charge-in-lieu-of-Assessment" as required by the TMC 12.08.350 and to remove from the public record, the property or properties subject to "*additional tap or connection charges for sanitary sewers*" as required by Chapter 65.08 of the Revised Code of Washington (R.C.W.). After the work is completed and the record drawings received by the Public Works Department, a certificate of payment and release will be filed with the Pierce County Auditors office. Parcels can be transferred without the "*NOTICE*" being on title.

Copies of the In Lieu of Assessment Release Form and an information sheet regarding the form are provided at the end of this chapter.

9.040 Right-of-way

In some instances additional right-of-way dedication from adjacent property owners may be required to accommodate the proposed improvements. It is then incumbent upon the

applicant to acquire said right-of-way. In instances where additional right-of-way is required said right-of-way must be provided to the City prior to work order plan approval, except in the case of pending plat approvals.

In instances where the right-of-way to be dedicated to the City is a part of the plat and/or required in the conditions, said right-of-way may be dedicated at the time of final plat.

9.050 Easements

Easements are generally divided into two distinct categories, public and private. Public easements are required for access, maintenance, and protection of City conveyance systems and right-of-way. Private Easements are generally an agreement between private property owners for owning and maintaining a private improvement.

For easements dedicated to the City for the purpose of storm or sanitary sewers, the following shall apply:

No permanent structures(s) shall be erected within the easement area(s) unless specifically approved in writing by the City of Tacoma Director of Public Works. Permanent structures shall mean any concrete foundation, concrete slab, wall, rockery, building, deck, and overhanging structures, fill material, recreational sport courts, carports, portable sheds, private utilities, fences, or other site improvement that will unreasonably interfere with the need to access or construct utilities in said easements(s). Permanent structures shall not mean improvements such as normal landscaping, asphalt paving, gravel, or other similar site improvements that do not prevent the access of men, materials, and machinery across, along, and within the said easement area. Land restoration by the City within the said easement area will be strictly limited to grass seed, grass sod, and/or asphalt replacement unless otherwise determined by the City of Tacoma.

Note: Preliminary project planning should take into account the potential loss of buildable area or the need to purchase more property as a result of conveyance facilities and associated necessary easements/tracts.

Refer to the City of Tacoma Stormwater Management Manual for additional information regarding easements, easement widths, and access ways pertaining to storm drainage construction.

A. Private Access way Easements

Private access way easement widths are as specified in the conditions of the shortplat where applicable. Please note that this is a separate and distinct easement from any public easement required for the site. Public sewer easements may be granted and contained within private easements designated for private accessways.

B. Requirements for Sanitary Easements

Public sanitary easements shall conform to the following table:

Invert Depth	Width
Less than 10 feet	20 feet
10 to 15 feet	25 feet
15 to 20 feet	30 feet
Greater than 20 feet	40 feet

- Greater width may be required for large diameter pipe or unfavorable site conditions.
- Pipe shall be installed in center of easement.
- If two pipes are to be installed in an easement, add ten (10) feet to the easement widths listed above. Use the deeper of the two pipes in selecting the easement width from this table. Install pipes with ten (10) feet of horizontal clearance between them.

C. Requirements for Maintenance Access Easements

All publicly owned conveyance structures shall be accessible at all times. A minimum 15-foot access easement shall be provided to conveyance facilities from a public street or right-of-way. At a minimum, accessways shall be surfaced with six (6) inches of crushed rock, a minimum of 12 feet in width, or other approved all weather surface, to allow year-round equipment access to the conveyance facility.

Additional requirements with regards to storm water conveyance facilities can be found in the City of Tacoma Surface Water Management Manual.

D. Recording Prior to Work Order Approval

In some instances easements may need to be obtained from adjacent private property owners to accommodate the proposed improvements. It is then incumbent upon the applicant to acquire said easement. In instances where easements are required that are not located within the plat, said easement must be provided to the City prior to work order approval.

In instances where an easement is a part of the plat and/or required in the conditions, said easement may be provided at the time of final plat.

Note: Preliminary project planning should account for the potential loss of buildable area or the need to purchase more property as a result of conveyance facilities and their required easements/tracts.

E. Easement Recording Procedure

The owner/developer or a duly authorized representative shall not record the public easement with the Pierce County Auditor. The City will record the easement as described below. In order to obtain an easement, the owner/developer or a duly authorized representative must adhere to the following procedure:

- Determine the required easement width as outlined in this section or as mandated through the plan review process of the work order.

- Provide a legal description for the easement and submit it along with an acceptable plan showing the location of said easement to the City of Tacoma General Services Department, Asset Management Division, Real Estate Services Section, 591-5535. The Real Estate Services Section is located at the Tacoma Municipal Building, Room 737.
- The Real Estate Services Section will then review this description for accuracy and transfer it to the proper easement form.
- This form is then returned to the applicant for the required signatures of the owners. These signatures must be notarized.
- It is then the responsibility of the applicant to return the signed easement form to the right-of-way section that will then in turn record it with the Pierce County Auditor.

9.060 Traffic Control Requirements (Work Orders)

All work orders with new improvements within an existing roadway, or any construction that will adversely impact the flow of traffic shall include the minimum special traffic control requirements on the work order plans.

Exceptions to the typical requirements will be required for any construction contained within an arterial street. Exceptions in these cases will be written by the City of Tacoma Traffic Engineering Section of the Public Works Engineering Division and will be required to be shown on the work order drawings.

A copy of the typical special traffic control requirements, with the format of typical exceptions, can be found at the end of this chapter.

A. Street Closures, Non-Arterial Streets

All street closures will be approved on a project-by-project basis. Generally, non-arterial streets may be closed to through traffic, provided that local access is maintained at all times with a minimum of a 20-foot wide access lane. It is required that closures be coordinated with the various businesses and/or residences adjacent to the project site. A minimum of one access shall be maintained to all properties at all times.

B. Lane and Street Closures, Arterial Streets

Generally, it is necessary that traffic be maintained at all times on arterial streets. When necessary, and justified, lanes of traffic may be closed during specified hours of the day. The determination of these hours shall be in consultation with and subject to the approval of the City Traffic Engineer. Only in unusual circumstances will full closures of arterial streets be considered. Local access must be maintained at all times with a minimum of a 20-foot wide access lane. Again, it is required that closures be coordinated with the various businesses and/or residences adjacent to the project site. A minimum of one access shall be maintained to all properties at all times.

C. Notification

Three (3) working days prior to any street closure, the contractor shall notify:

Tacoma Public Works Engineering Division	(253-591-5500)
Tacoma Public Works Streets and Grounds	(253-591-5495)
Tacoma Public Works Solid Waste	(253-591-5544)
Tacoma Fire Department	(253-591-5733)
Tacoma Police Department	(253-591-5951)
LESA Communication Center	(253-798-4721 – Opt. #3)
Tacoma Public Schools Transportation Office	(253-571-1853)
Pierce Transit	(253-581-8109)

9.070 Environmental Checklist and EIS

The State Environmental Policy Act (SEPA), Chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental checklist is required to be filed with the City for all projects that do not meet specific exemption thresholds. The purpose of the environmental checklist is to provide information to help the applicant and the City identify impacts from the proposal (and to reduce or avoid impacts from the proposal, where applicable) and to help the City determine whether an environmental impact statement (EIS) is required. An EIS is required for all proposals that have probable significant adverse impacts on the quality of the environment.

In many cases, an environmental checklist is required in conjunction with the improvements outlined on the work order drawings. The complete set of categorical exemptions is contained in the State's SEPA Rules (Chapter 197-11 WAC) and the City of Tacoma's Environmental Code (TMC Chapter 13.12). Two of the exemption thresholds outlined in WAC 197-11 and TMC 13.12 most frequently encountered in the work order process that triggers the requirement for an environmental checklist are as follows:

- Any utility pipe installed greater than eight (8) inches in diameter.
- Any landfill or excavation in excess of 500 cubic yards.

Information on, and the filing of, the environmental checklist shall be through the Building and Land Use Services Division Permit Counter (591-5030). If an environmental checklist is required for the improvements to be constructed under the work order, the environmental review process must be completed and a final environmental determination obtained prior to work order approval.

9.070 Grading, Excavation, and Erosion Control

Please see Appendix 'F' for a copy of the City of Tacoma amendments to the Uniform Building Code in relation to grading, excavation, and erosion control. Further information on the design of erosion control can be found in the City of Tacoma Surface Water Management Manual. The manual can be purchased from the Public Works Building and Land Use Services Division, located on the third floor of the Tacoma Municipal Building at 747 Market Street, 253-591-5030.

A. Grading Permit

If a grading, excavation, and construction stormwater pollution prevention (erosion control) plan and permit is required through the development conditions, a separate application to the Building and Land Use Services, Permit Counter must be made for review and approval of said plan. Please be advised that it is the applicant's responsibility to apply for this permit. It should be noted that this is a separate and distinct process from the work order process as described in Chapter 2 and that approval of the work order plans are dependent upon completion of this process. Care should be taken on the part of the applicant, developer, or engineer to verify that the appropriate plans are delivered to the correct location for review to prevent unnecessary time loss.

B. Work Order Grading, Excavation, and Erosion Control

If a separate grading excavation and erosion control permit is not required or if required grading, excavation, and erosion control plan does not address work to be performed within the right-of-way, erosion control best management practices (as required by the Surface Water Management Manual) and the erosion control notes shall be included as part of the work order.

As required by the 2003 City of Tacoma Surface Water Management Manual, a stormwater pollution prevention plan will be required on all work orders. The (SWPPP) shall be submitted along with the work order submittal and will be reviewed as such. The SWPPP must be approved before the work order will be approved.

Typical erosion control notes are provided in the Work Order Standard Specifications (see GovMe website, Std. Dwg. WOGN). Refer to Volume II of the City of Tacoma's 2003 Surface Water Management Manual for information relating to Erosion Control and Construction Stormwater Pollution Prevention Plans. Volume II provides a checklist and details for selecting erosion control best management practices.

The minimum requirements as noted in the required Construction Stormwater Pollution Prevention Plan typically include the construction sequence, clearing limits, identifying trees to be removed/saved, construction entrance location/details, drainage pattern/flow, connections to City stormwater system, stabilization of exposed soil, and an erosion control plan. Additional details may be required as dictated by the season, site, and proposed improvements.

9.080 Bonding

The applicant may be required to post a bond, provide an assignment of funds or otherwise allocate funds for the construction of the remaining required improvements. The determination of the bond amount is based on the engineer's itemized estimate of the remaining improvements. The City will review the itemized estimate quantities and unit prices for accuracy and provide the applicant with a bond amount. The bond amount must provide adequate funds for the City to administer the contract if necessary. A

worksheet for a typical itemized estimate is provided at the back of this manual in Appendix F.

A. Performance Bonds for Plat approval

When applying for final plat approval prior to constructing the required improvements, the City will require a performance bond for the construction of the remaining required improvements.

B. Bonding for Previously Platted Property

Lots on previously platted property will require a bond for the required improvements prior to approval of the work order plans.

9.100 Water Plans

It should be noted that submittal and approval of the water plans is a separate and distinct process from the work order process. Please note that it is the responsibility of the design engineer to coordinate the work order plans and the water plans and verify that no conflicts occur.

When proposed water mains will be located within City of Tacoma right of way, there is a requirement for the alignment and grade of the subject mains to be approved by the City of Tacoma Public Works Department. Water plans will not be approved by the Public Works Department until the alignment and grade of street, sanitary and storm improvements have been approved. The Public Works Department may approve water plans once the work order process for the roadway design has reached a point where the roadway alignment and grade are not expected to be altered.

A. Initiation of the Process for Design and Approval of Water Plans

Where specified by the development conditions, by the City of Tacoma, Department of Public Utilities, Water Division, dba Tacoma Water, or by the 2003 International Fire Code, extension of water mains and the installation of fire hydrants may be required. The applicant should contact Tacoma Water's Permit Counter at 253-502-8247 and submit a copy of the site plan to initiate the water plan design and approval process.

Based on the submitted site plan, a preliminary design and "Pre-design" letter will be prepared by Tacoma Water. The "Pre-design" letter will indicate the engineering fees and other requirements the applicant is responsible for associated with the water main extension.

Water mains can also be installed by LID. Contact should be made with Tacoma Water at 253-502-8247 regarding the process by which an LID is designed and constructed.

Prior to the initiation of the design, the applicant shall remit to the Tacoma Water Permit Counter the following:

- The design/inspection fee and signed time and material agreement as stated in the “Pre-design letter”. Please note that the fee and agreement alone are not acceptable without sufficient construction plans (see below).
- A set of construction plans that have been submitted to the building permit agency for initial review. If in using these plans, errors are found or changes are required, which necessitate a redesign of the water main, the project may be shifted to a later point in the water design queue. The water design will be resumed when the plans are deemed adequate for water design and scheduling of permits. An electronic copy of the plans should also be submitted to aid and expedite the design of the water plans.

B. Design

Design will commence within four weeks following receipt of required fee and plans. Tacoma Water will notify the Developer of the proposed completion date of the approved plans at this time.

C. Pre-Construction

Upon approval of the water plans by Tacoma Water and if necessary by the City of Tacoma Public Works Department, Tacoma Water will notify the applicant that the plans and specifications are ready to be picked up.

The Developer will select a contractor and supply information on the contractor to Tacoma Water. Tacoma Water will prepare the contract documents and notify the Developer when they are ready to be picked up. The Developer and Contractor will obtain, sign and process the contract documents and return them to Tacoma Water at which time they must be reviewed and approved by the City of Tacoma Legal Division.

Concurrently, Tacoma Water will supply to the Developer an estimate for cost of inspection, flushing and sampling and a “Time and Material Agreement” to cover these items. Upon receipt of the estimated fees, the “Time and Material Agreement”, and upon approval of the contract documents by the Legal Division, a pre-construction meeting with the contractor will be held.

Please note that Construction shall not begin until completion of the pre-construction meeting between the contractor and the Water Division.

For proper scheduling, the fees for the installation of water services should be paid prior to the time of the pre-construction meeting.

D. Construction

It is the responsibility of the applicant to provide a professional land surveyor registered in the State of Washington to stake the water main for construction in accordance with the approved plans and specifications.

The Water Division will provide labor and materials to inspect, flush and sample the water main, including installation and removal of sample stations. It should be noted that if the water main design must be altered after start of construction because of incorrect data furnished by the developer, the construction will stop and will not resume until a redesign fee has been paid to the Water Division and plans have been revised and approved.

E. Post Construction

The developer shall provide a legal description of the water main easement to Tacoma Water for review and processing. This must be completed and stamped by a licensed land surveyor in the State of Washington.

When easements have been processed, Tacoma Water will then issue a preliminary acceptance letter after the water main is placed in service.

F. Additional Considerations

Please note that the design engineer must reference the project to the Washington State Plane Coordinate System. Contact the City of Tacoma Public Works Department for survey coordinate information.

9.110 Local Improvement Districts (LIDs)

One alternative to the work order process is to form a Local Improvement District (LID). There are benefits to using either the Work Order process or the formation of an LID to construct the improvements. The developer should carefully research both processes to determine the best solution for their situation. The following is a summary of the LID process and provides answers to some common questions. Further questions surrounding the LID process should be directed to Ralph Rodriguez in the LID Section of the City of Tacoma Public Works Department at 591-5522, or Dave Wurzbach at 591-5523.

A. LID Definition

A Local Improvement District (LID) provides a way for property owners to share the cost for street and alley paving, sanitary sewer extensions, street lighting, water mains, sidewalks or underground wiring. Costs to the owners are deferred until the project is completed. Property owners agree to form LIDs when supported by 50 percent of the abutting properties. The City of Tacoma will consider the formation of an LID when the benefits from the improvements outweigh the costs to construct the improvements. Each property owner pays an amount proportional to the benefits that they receive for each property they own.

B. Starting an LID

An individual interested in an LID should contact either Ralph Rodriguez or Dave Wurzbach of the City of Tacoma LID Section at 591-5522 or 591-5523 and request a petition. The petitioner circulates the petition to property owners with the proposed

improvement area; owners in favor of the proposed improvement would indicate their support by sign the petition.

C. The Petition

The petition is advisory to the Tacoma City Council and must have signatures from property owners representing at least 50 percent of the property within the proposed LID. Upon receipt of an adequate petition, a public hearing is scheduled to verify the level of support.

D. LID Costs/Methods of Payment

The cost of an LID depends on the requested improvement. The City will prepare a cost estimate for the improvement and indicate the cost per frontage foot on the petition.

LIDs provide a method of payment for the improvements over a number of years with low-cost financing. After the contractor completes the work, the City will schedule another hearing for the final assessment for each property. Once this hearing has taken place, the City will bill the property owners for their LID payment. The property owners may then utilize one of the following methods for payment:

1. Make one payment and pay in full.
2. Make a simple-interest payment one per year, over a number of years, until the assessment has been paid off.
3. Pay off the balance at any time during the assessment period as set by a LID bond.

E. Financial Assistance

Financial assistance is available to owners on a fixed or limited income. Owners qualifying for the program would have their assessment paid for by the City of Tacoma. For further information on the LID assistance program, contact the LID Section of the Public Works Department.

F. The Hearing and the Initiation of Construction

The hearing allows affected property owners and other to discuss the LID. After the hearing, the Hearing Examiner makes a recommendation to the City Council based on conclusions from the hearing. If the City Council approves the formation of the LID, the City will commence with the design. Upon completion of the design, the City awards the project to a contractor, based on bids, and construction commences. The actual construction of the improvements begins approximately 12 months after the organizer has returned the petition of support to the City.

9.120 Miscellaneous Information

Attached on the following sheets:

- Private Property Construction Permit
- In Lieu of Assessment Release Form and Information Sheet
- Typical Traffic Control Requirements

PRIVATE PROPERTY CONSTRUCTION PERMIT

The following form shall be completed for each adjacent private property impacted by the project prior to the release of construction drawings. Adverse impacts to properties shall include, but not be limited to, discontinuity in grade, abrupt meet lines, access to driveways and garages, and drainage problems created or intensified as a result of the project. Measures taken to resolve adverse impacts shall be shown on the project construction drawings. Unless otherwise agreed upon, slopes shall be constructed using cuts and fills no steeper than 2:1. Where sidewalks are not being constructed, a graded pedestrian walk area shall be provided at a 2 percent slope immediately adjacent to the roadway. **It is the consulting engineer's responsibility to identify and resolve adverse impacts to adjacent properties prior to release of construction drawings.**

I (we) _____ hereby grant

_____ or his/her contractor permission to enter

the property known as _____
(address or legal description)

for the purposes of street/sewer construction. The developer agrees to do the following as mitigating measures: _____

The developer further agrees to leave the property in a clean, neat and orderly state.

Agreed this Date: _____

Private Property Owner(s)

Project Applicant (Developer)

Note: If it is determined by the Project Consulting Engineer that there are no adverse impacts to abutting private properties, he/she shall sign below and return this form.

Signature _____

SANITARY SEWER PLANS WILL NOT BE RELEASED FOR CONSTRUCTION UNTIL
THE "IN LIEU OF ASSESSMENT" RELEASE FORM (ATTACHED) IS COMPLETED BY
THE APPLICANT AND RETURNED TO:

Public Works Department / L.I.D. Section
Tacoma Municipal Building
747 Market Street, Suite 620
Tacoma, Washington 98402

The 'in lieu of assessment' release form is to identify property which should be credited for the construction of sanitary sewers. Credited property is released from future sanitary sewer connection charges (in lieu of assessment charges).

This form must be signed by the property owner or the owner's agent.

Requested assessment limits require review and approval by the City. In general, assessment limits are 120 feet deep across the property frontage. In cases of large lots with buildings outside the 120 feet, the property on which the building is situated may be included.

If you have any questions or need further information, please call Sue Simpson at 591-5529.

Date: _____

L.I.D. Administration Office
Public Works Department
747 Market Street, Suite 620
Tacoma, Washington 98402

Subject: Request for Release of In Lieu of Assessment for Sanitary Sewers

Gentlemen:

This is to certify that I (we) am (are) responsible for the cost of constructing the City of Tacoma
sanitary sewer in: (Location)

as provided by Work Order No. _____

I hereby request that City records be made to show the portions of the following described
property(s) that may be credited for the cost of said sanitary sewer, as determined by the City
and that releases be filed accordingly: (Legal Description)

Applicant

Address

Signature

Phone

Subscribed and sworn to me this ____ day of _____, 20__.

_____, Notary Public in and for the State

of _____ residing at _____.

SPECIAL TRAFFIC CONTROL REQUIREMENTS

LOCATION: *Project Vicinity (6000000####)*

The following special traffic controls shall supplement Section 1-07.23 of the Standard Specifications.

The contractor may close non-arterial streets to through traffic, provided that local access is maintained at all times with a minimum of a 20-foot wide access lane. The contractor shall coordinate any closures and cooperate with the various businesses and/or residences adjacent to the project site. A minimum of one access shall be maintained to all properties at all times.

Three (3) working days prior to any street closure, the contractor shall notify:

Tacoma Public Works Engineering Division	(253-591-5500)
Tacoma Public Works Streets and Grounds	(253-591-5495)
Tacoma Public Works Solid Waste	(253-591-5544)
Tacoma Fire Department	(253-591-5733)
Tacoma Police Department	(253-591-5951)
LESA Communication Center	(253-798-4721 – Opt. #3)
Tacoma Public Schools Transportation Office	(253-571-1853)
Pierce Transit	(253-581-8109)

ADDITIONAL REQUIREMENTS:

A. XXXX Street shall remain fully open to vehicular and pedestrian traffic at all times. EXCEPTION: **XXXX Street** may be reduced by the contractor to a minimum of one lane flagger controlled between the hours of - a.m. and - p.m.

B. YYYY Street shall remain fully open to vehicular and pedestrian traffic at all times. EXCEPTION: **YYYY Street** may be reduced to a minimum of one lane each direction for two way traffic between the hours of - a.m. and - p.m.

Appendix A

City of Tacoma Public Works Standard Plans

General Notes

Standard Plan Number	Description	Date
WOGN	Work Order General Notes (with border)	4/14/2003

Design Reference Plans

Standard Plan Number	Description	Date
DR-01	Standard Symbols	2/12/2003
DR-02	Standard Shading	2/12/2003
DR-03	Final Plan for Improvements	3/14/2003
DR-04	Typical Utility Layout (60' Residential Street)	2/13/2003
DR-05	Typical Utility Layout (52' Residential Street)	2/13/2003
DR-06	Minimum Standard for Cul-de-sac	2/13/2003
DR-07	Detail Drawing for Street Intersection Design	2/13/2003

Street/Utility Plans

Standard Plan Number	Description	Date
SU-01	Poured Monument	2/13/2003
SU-02	Precast Concrete Monument	3/10/2003
SU-03	Cement Concrete Curb and Gutter	3/11/2004
SU-04	Cement Concrete Sidewalk	3/11/2004
SU-05	Curb Ramp (General Information)	3/11/2004
SU-05A	Curb Ramp (Details)	3/11/2004
SU-06	Minimum Sidewalk Width at Obstructions	2/13/2003
SU-07	Cement Concrete Approach, Type 1	3/11/2004
SU-08	Cement Concrete Approach, Type 2	3/11/2004
SU-09	Cement Concrete Approach, Type 3	3/11/2004
SU-10	Cement Concrete Stairway	2/13/2003
SU-11	Stairway Handrail	2/23/2003
SU-12	Bollard Details	2/14/2003
SU-13	End of Road Marker	2/14/2003
SU-14	Typical Trench Patch for Cement Concrete Pavement and Base	3/11/2004

Street/Utility Plans

Standard Plan Number	Description	Date
SU-15	Typical Trench Patch for Asphalt Concrete/Oil Mat	3/11/2004

	Pavement	
SU-16	Pipe Bedding and Backfill for Sanitary and Storm Sewers	3/14/2003
SU-17	Manhole Type 1 (48", 54", and 60")	2/14/2003
SU-18	Manhole Type 2 (72" and 96")	2/14/2003
SU-19	Manhole Type 3	2/14/2003
SU-20	Cast-in-Place Manhole Base	2/14/2003
SU-21	Misc. Details for Manholes and Catch Basins	2/14/2003
SU-22	Manhole Frame and Cover	2/14/2003
SU-23	Lateral Sewer Connection to Sanitary Sewer Main	2/14/2003
SU-24	Side Sewer Cleanout and Cover Detail	2/14/2003
SU-25	Utility Adjustment	2/14/2003
SU-26	Standard Procedure for Marking Construction Stakes	2/14/2003

Traffic Signal Plans

Standard Plan Number	Description	Date
TS-01	Vehicle Traffic Signal (Single and Multiple) Hanger Assembly	2/11/2003
TS-02	Span Wire Strain Clamp	2/11/2003
TS-03	H-Type Pedestrian Push Button Assembly	2/11/2003
TS-04	Span Wire Detail	2/11/2003
TS-05	Riser Assembly Underground Service Conduit	2/11/2003
TS-06	Riser Assembly Communication Signal Conduit	2/11/2003
TS-07	Streetlight Mast Arm Mounting Flange Detail	2/11/2003
TS-08	Junction Box Installation	3/11/2004
TS-09	Strain Pole Standard Foundation	3/10/2003
TS-10	Foundation & Apron for 'M' & 'P' Controller Cabinets	2/12/2003
TS-11	Induction Loop Details	2/12/2003
TS-12	Pedestrian Signal Clamshell Pole Mounting Detail	2/12/2003
TS-13	Vehicle Signal Head Pole Mount Detail	2/12/2003
TS-14	Standards for Signal Placement	2/12/2003
TS-15	Traffic Signal Phase Orientation	2/12/2003
TS-16	Vehicle Induction Loop Typical Layout	2/12/2003
TS-17	Standard Type Designations and Type PPB, PS, I, RM & FB Details	3/10/2003

Streetlight Plans

Standard Plan Number	Description	Date
SL-01	Luminaire on Wood Pole Typical Installation	2/11/2003

SL-02	Streetlight Foundation 30" and 40'	3/10/2003
SL-03	Standard Embedded Type Installation Detail-Typical	3/10/2003
SL-04	Timber Pole Typical Installation with Underground Feed	2/11/2003
SL-05	Splice for Handholes	2/11/2003
SL-06	Pole Addresses Typical Installation	2/11/2003
SL-07	Overhead Triplex Spans Typical Installation	2/11/2003
SL-08	Service Detail Underground, Type A	2/11/2003
SL-09	Service Detail Underground, Type B	2/11/2003
SL-10	Grounding Detail	2/11/2003

ITEMS	TO BUILD	EXISTING	ITEMS	TO BUILD	EXISTING
CEMENT CONCRETE PAVEMENT			COMBINATION POLE		
ASPHALTIC CONCRETE PAVEMENT			TELEPHONE POLE		
CEMENT CONCRETE SIDEWALK			GUY POLE		
CEMENT CONCRETE CURB			ANCHOR OR DEADMAN		
STORM SEWER	NEW 36" STORM	D 24" STORM D	CONDUIT		
SANITARY SEWER	NEW 8" SAN	S 8" SAN S	TREE		
MANHOLE		WATER LIGHT STEAM TELE. GAS SEWER W L S T G O	WIRE FENCE		
INLET OR CATCH BASIN		D	WOOD FENCE		
TELEPHONE CONDUIT		T	MONUMENT		
GAS MAIN		G 2" GAS G	ROCK WALL		
GAS SERVICE		G	RETAINING WALL		
WATER MAIN		W 12" C.I.W.M. W	PROFILE CENTER LINE	EXIST. C	
WATER SERVICE		X GATE X METER	PROFILE LINE, RIGHT	CURB GRADE RIGHT	
HYDRANT			PROFILE LINE, LEFT	CURB GRADE LEFT	
WATER GATE			CULVERT PIPE		8" CULVERT
ORNAMENTAL LIGHT			MONUMENT LINE		
POWER POLE			CONSTRUCTION CENTER LINE		

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

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CITY ENGINEER

DATE 2/4/03


STANDARD SYMBOLS


STANDARD PLAN NO. DR-01

ALL NEW PAVEMENT AND SIDEWALK CONSTRUCTION BEHIND THE NEW CURB LINE WILL BE SHADED.

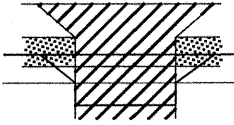
ALL REMOVAL OR REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT OR SIDEWALK BEHIND THE NEW CURB LINE SHALL BE SHADED.

WHERE NO SHADING APPEARS BETWEEN THE NEW CURB LINES, REFER TO THE TYPICAL SECTIONS TO DETERMINE WHAT IS TO BE DONE IN THE SPECIFIC AREA.

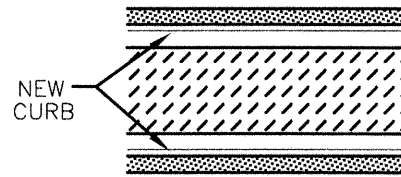
 THIS TYPE OF SHADING DENOTES REMOVAL AND REPLACEMENT OF EXISTING WALK.

 THIS WOULD DENOTE CONSTRUCTION OF NEW CURB, SIDEWALK, AND A DRIVEWAY AS SHOWN.

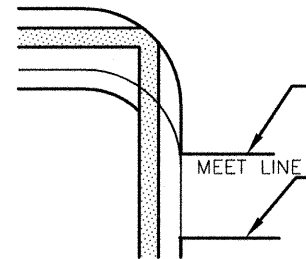
ALL EXISTING IMPROVEMENTS (PAVEMENT, SIDEWALKS, ETC.) WILL BE REMOVED BETWEEN A POINT ONE (1) FOOT IN FRONT OF THE EXISTING FACE OF CURB AND THE BACK OF THE NEW CURB.

 THIS WOULD DENOTE REMOVAL OF EVERYTHING BETWEEN THE OLD AND NEW CURB LINES; CONSTRUCTION OF A NEW INTEGRAL WALK AND A NEW DRIVEWAY; ALSO THE REMOVAL AND REPLACEMENT OF THE EXISTING DRIVEWAY SLAB TO THE SHADED LIMITS.

WHERE A PERMANENT PAVEMENT SURFACE EXISTS BETWEEN THE NEW CURB LINES (OTHER THAN DRIVEWAYS AND PARKING AREAS) THE PAVEMENT WILL REMAIN UNLESS SHADED.



THIS WOULD DENOTE CONSTRUCTION OF NEW CURB LINES, INCLUDING REMOVAL OF EVERYTHING BETWEEN EXISTING AND NEW CURB LINES, WITHOUT DISTURBING EXISTING WALKS. SHADING SHOWS THAT EXISTING PAVEMENT (ASPH., CONC., OR ASPH. OVER CONC.) IS TO BE REMOVED.



WHEN LINE IS LABELED IT DENOTES MEET LINE OF NEW PAVING WITH EXISTING PAVED STREETS.

WHEN LINE IS NOT LABELED IT DENOTES LIMITS OF FULL SECTION PAVING MEETING UNPAVED STREETS.



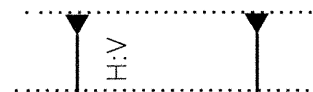
SHADED BORDER WITH SOLID LINE DENOTES ASPHALT PAVING ON UNPAVED STREETS. IT WILL ALSO BE USED TO SHOW ASPHALT PAVING OF DRIVEWAYS AND ALLEYS.



SHADED BORDER WITH DASHED LINE DENOTES GRADING REQUIRED ON DIRT STREET. IT WILL ALSO BE USED TO SHOW REQUIRED GRADING IN DIRT ALLEYS AND DRIVEWAYS.



DENOTES TOP OR TOE OF SLOPE. ALSO LIMITS OF CONST. PERMITS WHEN LABELED CONST. PERMIT.



DENOTES APPROXIMATE LIMITS OF FILL OR CUT SLOPE. SHADED TRIANGLE SHOWS TOP OF SLOPE.

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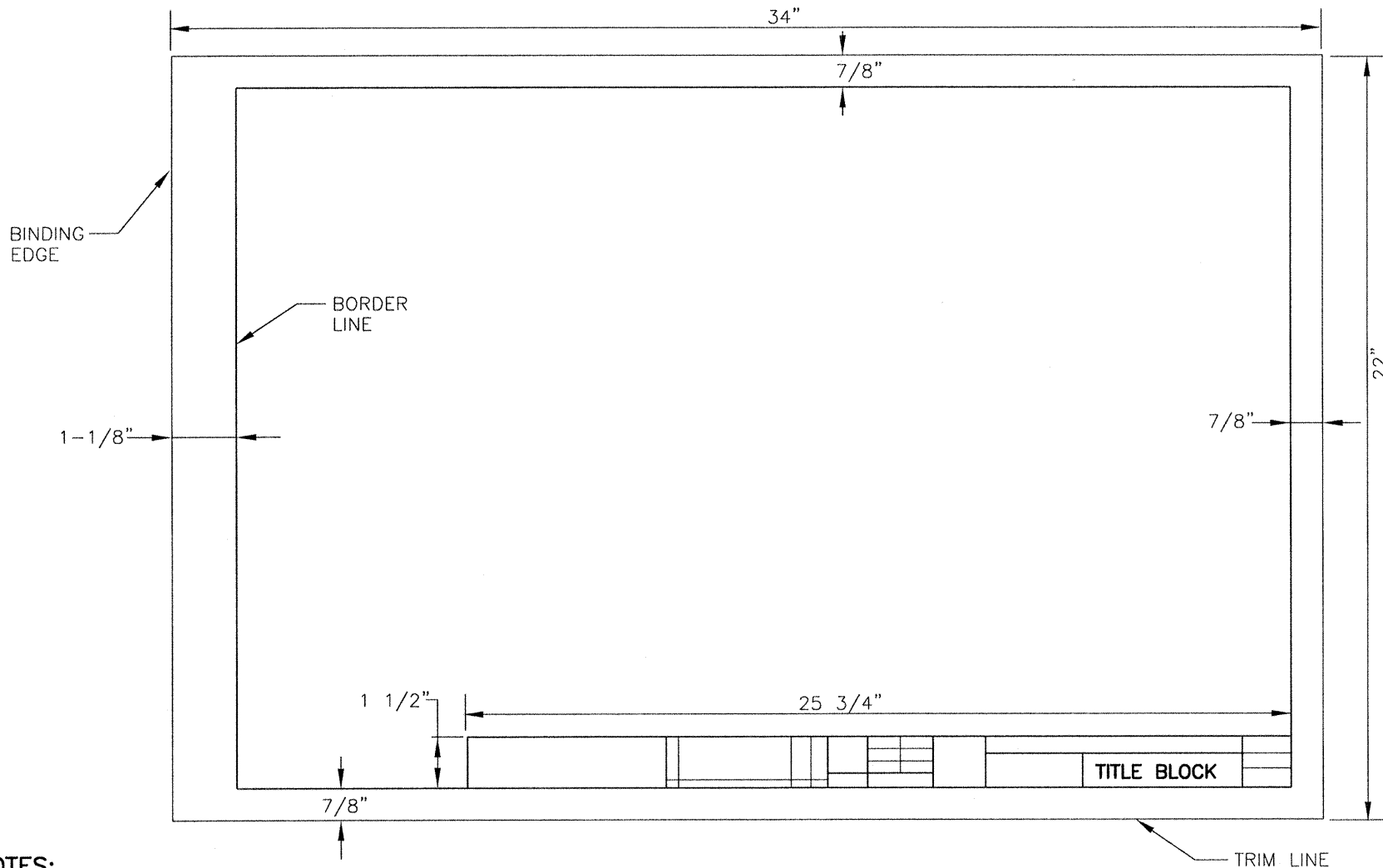
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DATE 2/4/03

STANDARD SHADING
SYMBOLS FOR
CONSTRUCTION PLANS

STANDARD PLAN NO. DR-02



NOTES:

(POSITION NORTH IN GENERAL DIRECTION OF TOP OR TO RIGHT OF SHEET)

(PREPARE THIS LAYOUT PLAN FOR READING FROM BOTTOM OR THE RIGHT)

PLAN

1 INCH = 20 FEET
OR
1 INCH = 50 FEET

SCALES

HORIZONTAL
1 INCH = 20 FEET
OR
1 INCH = 50 FEET

PROFILE

VERTICAL
1 INCH = 5 FEET
OR
1 INCH = 10 FEET

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DEPARTMENT OF PUBLIC WORKS

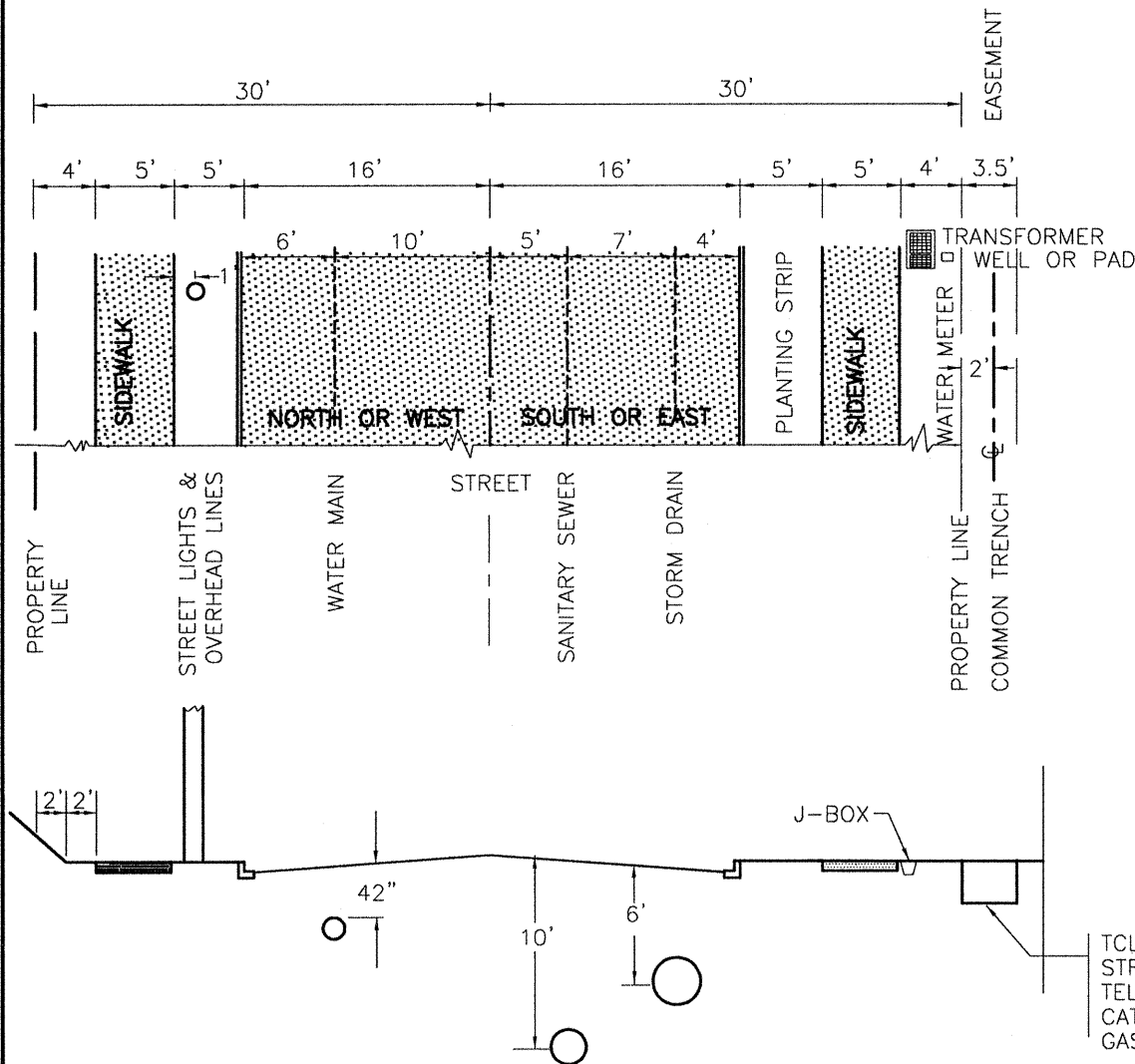
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CITY ENGINEER

DATE

FINAL PLAN
FOR IMPROVEMENTS

STANDARD PLAN NO. DR-03



NOTES:

1. USE THIS STANDARD FOR NEW PLATS AND FOR OLDER PLATTED AREAS WHERE THERE ARE NO OTHER DEVELOPMENTS THAT PROHIBIT ITS USE.
2. LIGHT DIVISION AND WATER DIVISION AGREE THAT UNDERGROUND PRIMARY ELECTRICAL CABLE WILL NORMALLY BE IN THE S. OR E. SIDES OF THE STREETS AND WATER MAINS IN N. OR W. SIDES.
3. LOCATE TRANSFORMER WELL OR PAD MINIMUM OF 6" AND MAXIMUM OF 12" FROM FUTURE SIDEWALK LOCATION. OBTAIN EASEMENTS WHERE NECESSARY.
4. COMMUNICATION PEDESTALS TO BE LOCATED A MINIMUM OF 12" FROM TRANSFORMER WELL, AT ANGLE 45 DEGREES FROM SIDES OF WELL.
5. ELECTRIC AND COMMUNICATIONS LONGITUDINAL UG CABLE DEPTH DEPENDS ON JOINT LAY:
 - A. WHEN TELEPHONE COMPANY BURIES ALONE, ADJUSTED DEPTH AND LOCATION MAY BE AGREED UPON IN EACH CASE.
 - B. WHEN LIGHT DIVISION BURIES ALONE OR JOINT WITH TELEPHONE COMPANY AND/OR CABLE TV, TRENCH DEPTH SHALL BE MINIMUM OF 38" (36" MIN. COVER) FROM AVERAGE GROUND GRADE. REFER TO TACOMA PUBLIC UTILITIES STANDARD PLAN S604.0111 FOR TRENCHING DETAILS.
6. COMMON TRENCH SHALL BE LOCATED IN EASEMENT INSIDE OF PROPERTY LINE. IF NO EASEMENT EXISTS UTILITIES IN COMMON TRENCH SHALL BE LOCATED IN PLANTING STRIP.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

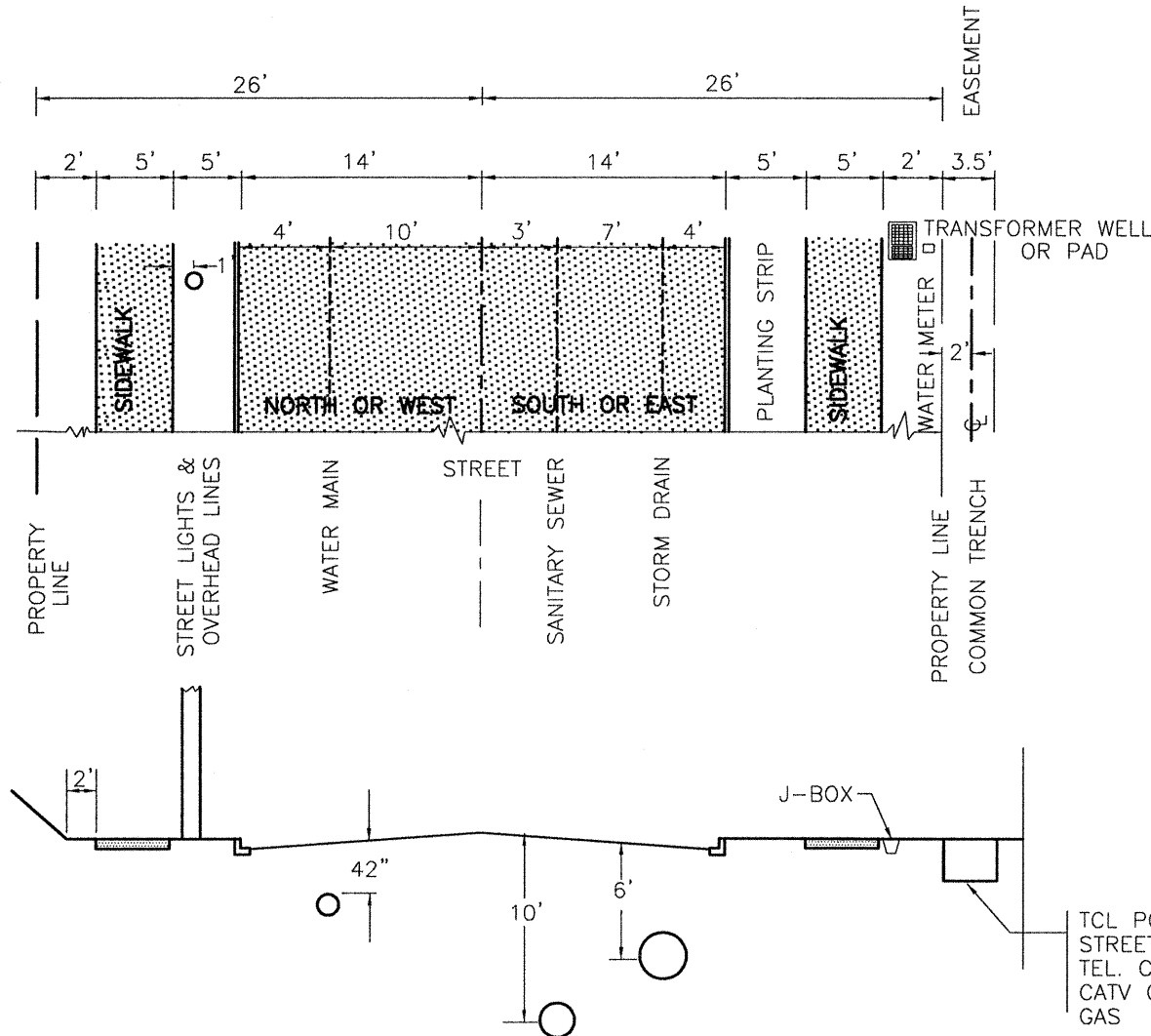
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CITY ENGINEER

DATE 2/4/03

TYPICAL UTILITY LAYOUT
60' RESIDENTIAL STREET
RIGHT OF WAY-CITY

STANDARD PLAN NO. DR-04



NOTES:

1. USE THIS STANDARD FOR NEW PLATS AND SUBDIVISIONS WHERE THERE ARE NO OTHER DEVELOPMENTS THAT PROHIBIT ITS USE.
2. LIGHT DIVISION AND WATER DIVISION AGREE THAT UNDERGROUND PRIMARY ELECTRICAL CABLE WILL NORMALLY BE IN THE S. OR E. SIDES OF THE STREETS AND WATER MAINS IN N. OR W. SIDES.
3. LOCATE TRANSFORMER WELL OR PAD MINIMUM OF 6" AND MAXIMUM OF 12" FROM FUTURE SIDEWALK LOCATION. OBTAIN EASEMENTS WHERE NECESSARY.
4. COMMUNICATION PEDESTALS TO BE LOCATED A MINIMUM OF 12" FROM TRANSFORMER WELL, AT ANGLE 45 DEGREES FROM SIDES OF WELL.
5. ELECTRIC AND COMMUNICATIONS LONGITUDINAL UG CABLE DEPTH DEPENDS ON JOINT LAY:
 - A. WHEN TELEPHONE COMPANY BURIES ALONE, ADJUSTED DEPTH AND LOCATION MAY BE AGREED UPON IN EACH CASE.
 - B. WHEN LIGHT DIVISION BURIES ALONE OR JOINT WITH TELEPHONE COMPANY AND/OR CABLE TV, TRENCH DEPTH SHALL BE MINIMUM OF 38" (36" MIN. COVER) FROM AVERAGE GROUND GRADE. REFER TO TACOMA PUBLIC UTILITIES STANDARD PLAN S604.0111 FOR TRENCHING DETAILS.
6. CUT OR FILL LIMITS TO BEGIN AT PROPERTY LINE. OBTAIN SLOPE EASEMENTS WHERE NECESSARY
7. COMMON TRENCH SHALL BE LOCATED IN EASEMENT INSIDE OF PROPERTY LINE. IF NO EASEMENT EXISTS UTILITIES IN COMMON TRENCH SHALL BE LOCATED IN PLANTING STRIP.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

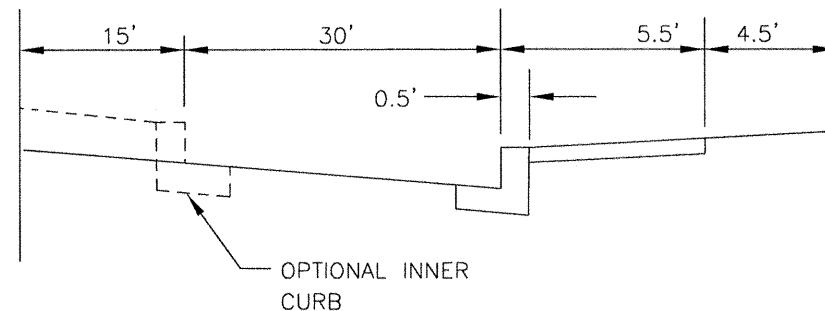
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CITY ENGINEER

DATE 2/4/03

TYPICAL UTILITY LAYOUT
52' RESIDENTIAL STREET
RIGHT OF WAY-CITY

STANDARD PLAN NO. DR-05

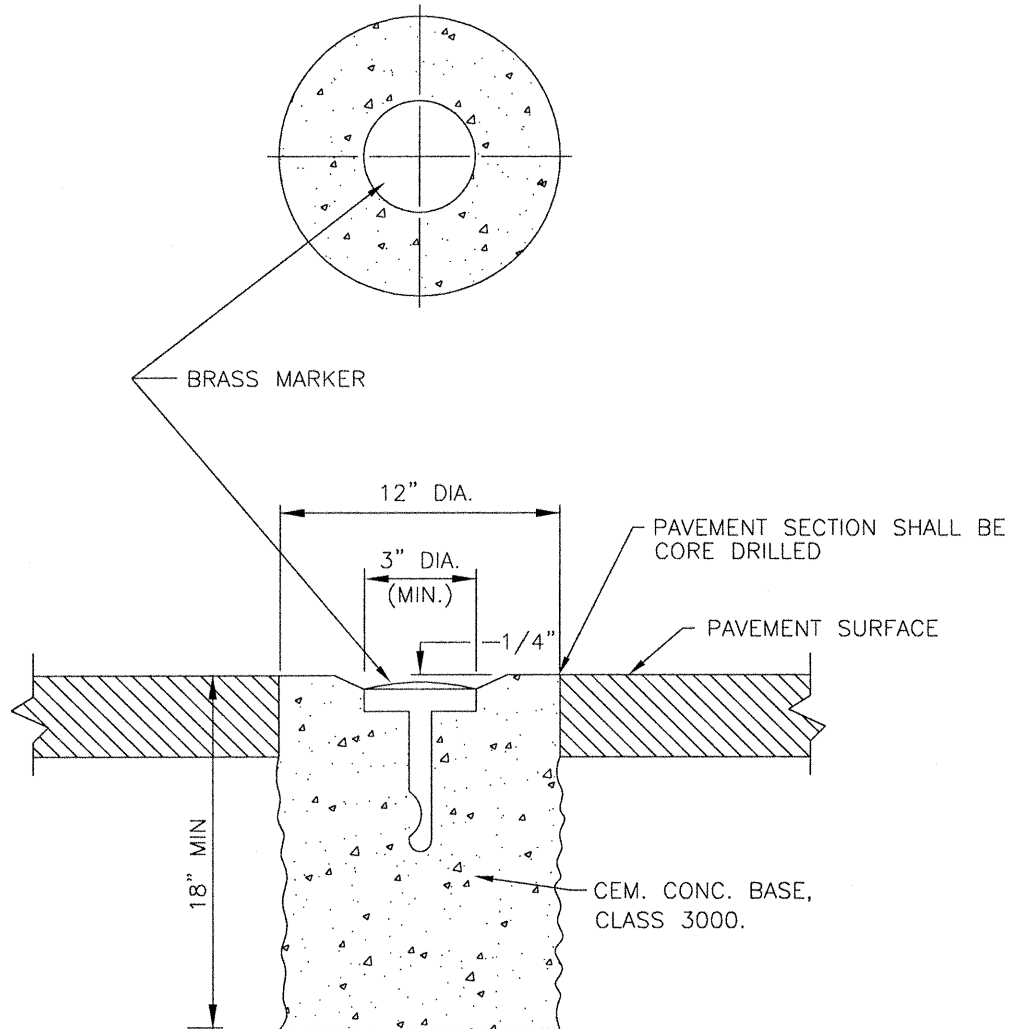


**MINIMUM STANDARD
FOR
CUL-DE-SAC**

STANDARD PLAN NO. DR-06

NOTES:

1. CONCRETE BASE SHALL BE POURED IN PLACE. HAND MIXED CONCRETE IS PROHIBITED. CONCRETE BASE NEED NOT BE FORMED.
2. NOTICE TO SURVEYORS: ANY MONUMENT SET IN THE CITY OF TACOMA MUST BEAR THE LAND SURVEYOR NUMBER OF THE SURVEYOR SETTING THE MONUMENT. MONUMENTS SET AS PART OF AN APPROVED PLAT ARE EXEMPT.
3. THE SURVEYOR IS TO SUPPLY THE CITY OF TACOMA WITH A COPY OF THE CALCULATIONS USED TO DETERMINE ALL MONUMENT POSITIONS BEFORE THE MONUMENTS ARE SET.
4. BRASS MARKER FOR CITY OF TACOMA FUNDED PROJECTS WILL BE SUPPLIED BY THE CITY, ALL OTHER BRASS MARKERS TO BE SUPPLIED BY THE CONTRACTOR.
5. MONUMENT MUST BE MAGNETICALLY LOCATABLE.



**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

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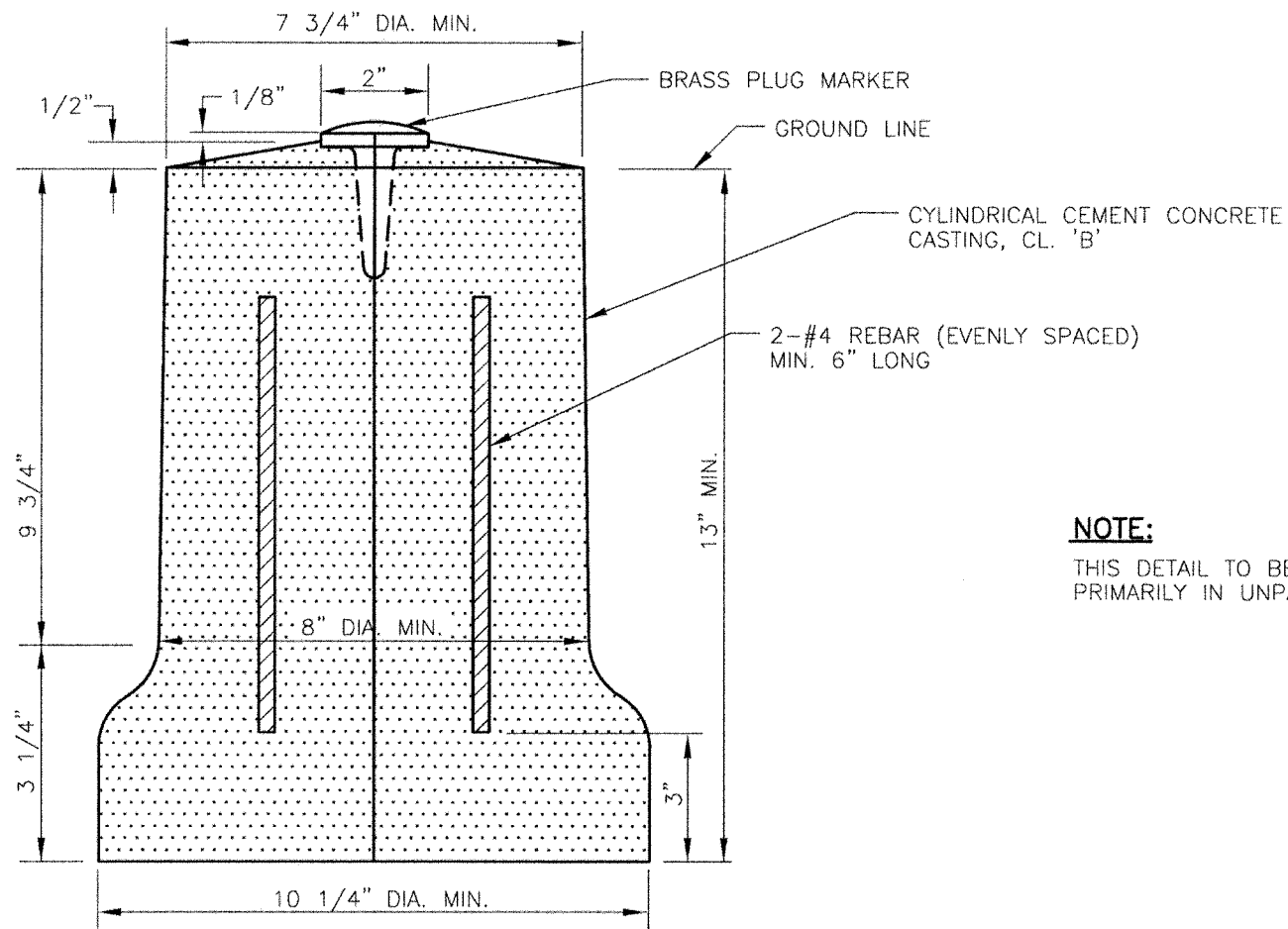
POURED MONUMENT

CITY ENGINEER

DATE 2/4/03

STANDARD PLAN NO.

SU-01



NOTE:

THIS DETAIL TO BE USED
PRIMARILY IN UNPAVED AREAS.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

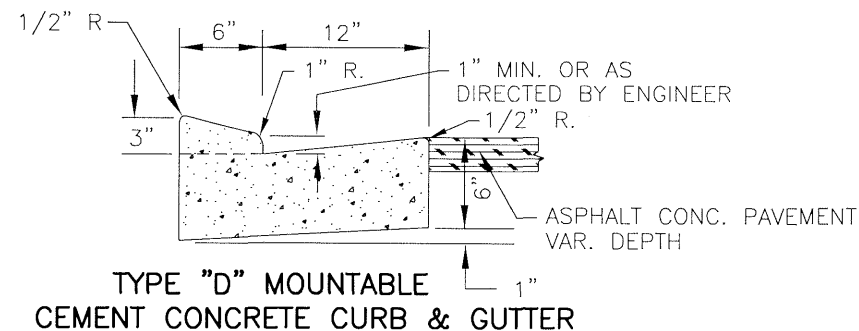
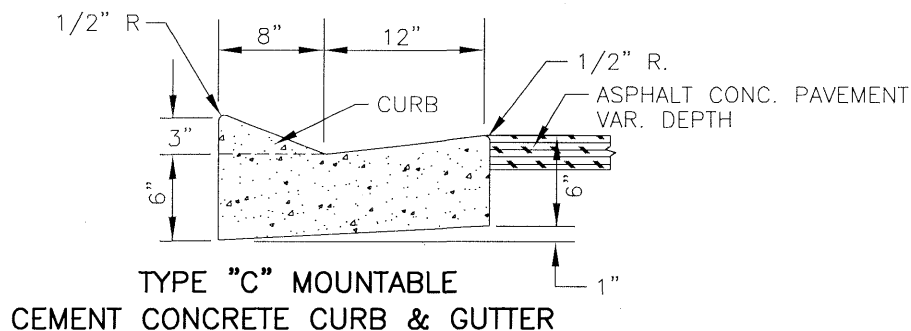
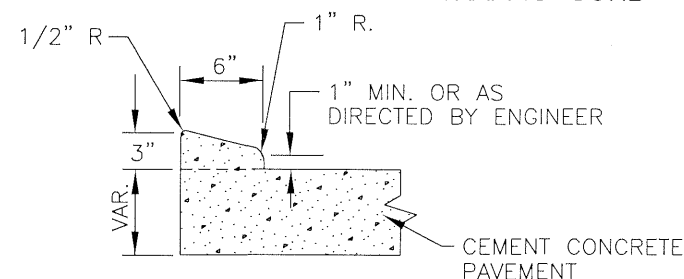
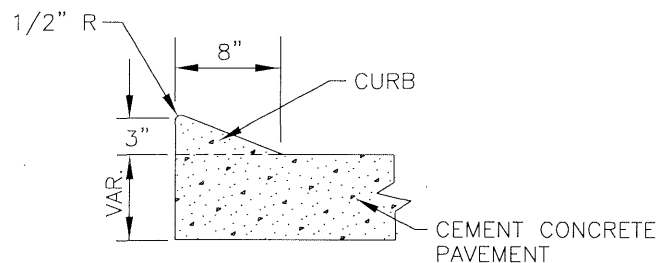
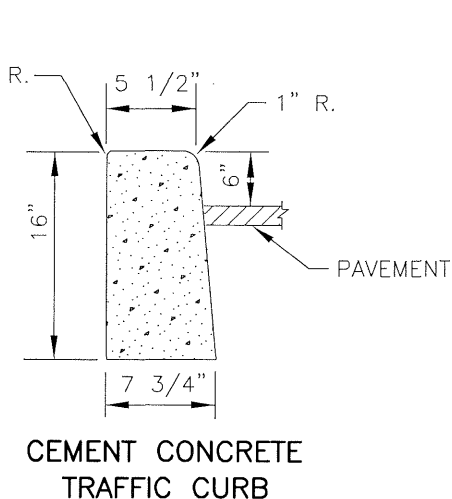
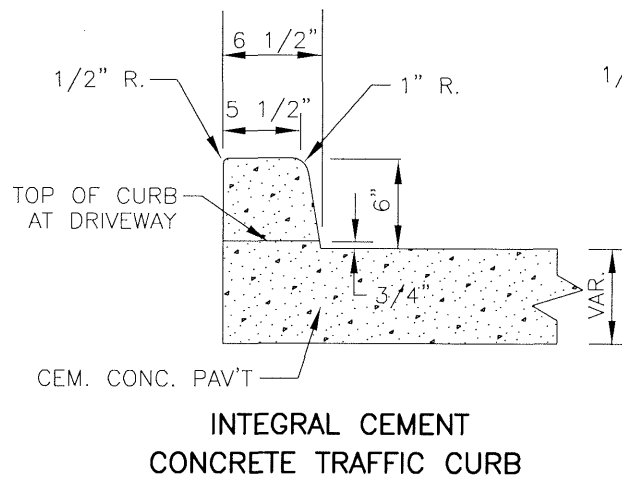
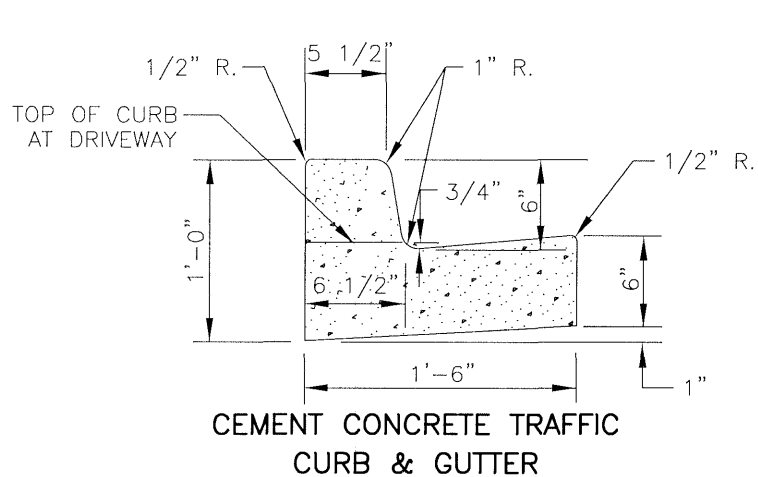
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DATE 2/4/03

PRECAST CONCRETE
MONUMENT

STANDARD PLAN NO. SU-02



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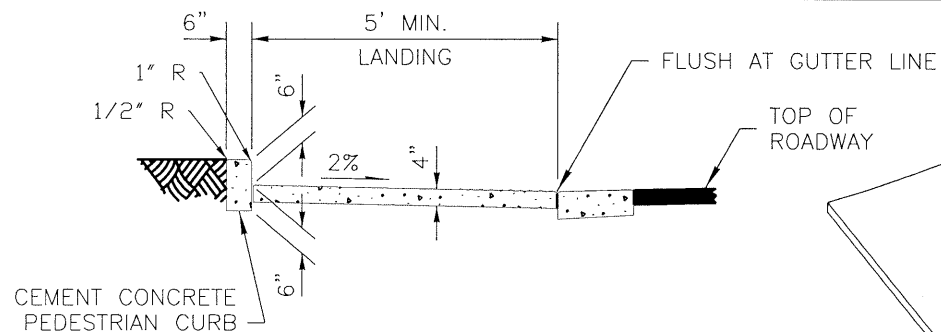
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CITY ENGINEER

3/11/04
DATE

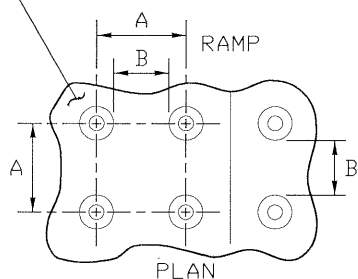
CEMENT CONCRETE
CURB AND GUTTER

STANDARD PLAN NO. SU-03

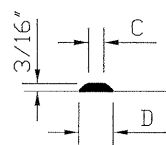


SECTION A-A

DETECTABLE WARNING PATTERN AREA.



	MIN.	MAX.
A	1-5/8"	2-3/8"
B	5/8"	1-1/2"
C	7/16"	3/4"
D	7/8"	1-7/16"



ELEVATION

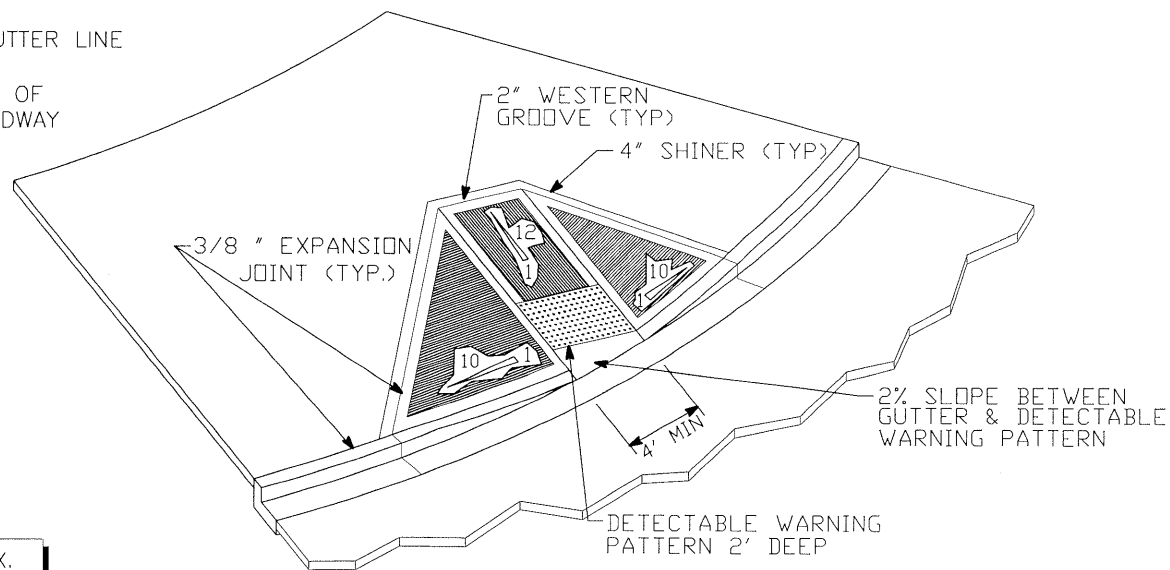
EDGE SHALL BE FLUSH WITH ADJACENT CONCRETE.

DETECTABLE WARNING PATTERN DETAIL

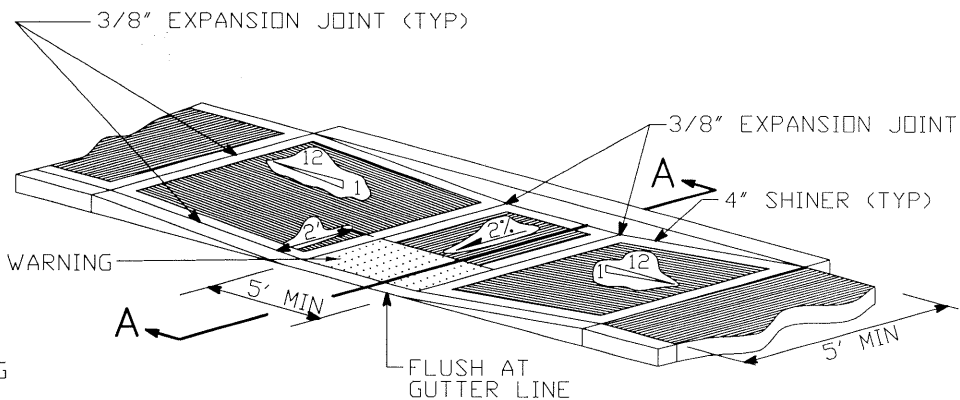
NOTES

THE DETECTABLE WARNING PATTERN SHALL BE ARMOR-TILE TACTILE SYSTEM MANUFACTURED BY ENGINEERING PLASTICS INC. OR EQUAL. CONCRETE SHALL BE BLOCKED OUT AS REQUIRED FOR THE INSTALLATION OF THE DETECTABLE WARNING PATTERN MATERIAL.

THE DETECTABLE WARNING PATTERN AREA SHALL BE YELLOW AND SHALL MATCH THE COLOR OF "STANDARD INTERSTATE YELLOW" PAINT AS SPECIFIED IN FORMULA K-2-83.



SIDEWALK RAMP-TYPE 1



SIDEWALK RAMP-TYPE 2

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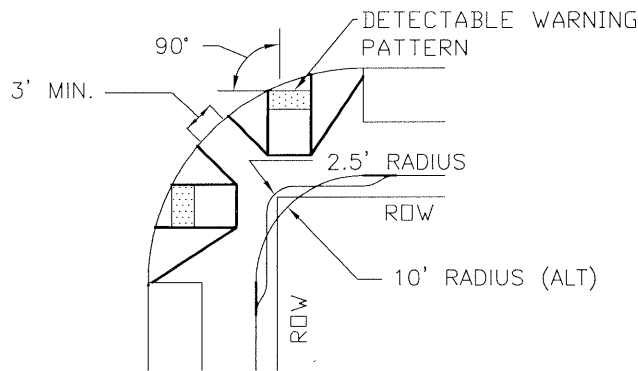
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

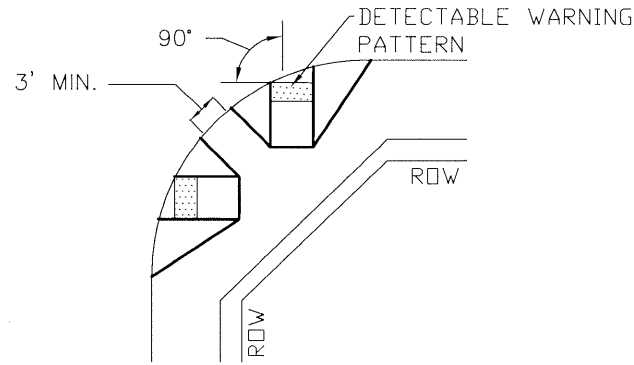
3/11/04
DATE

SIDEWALK RAMP
(DETAILS)

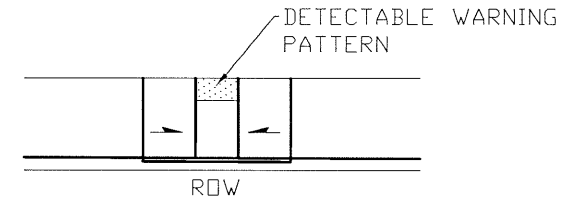
STANDARD PLAN NO. SU-05A



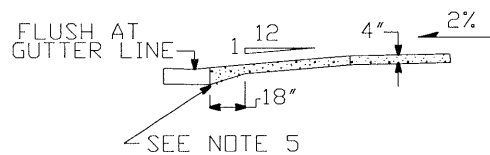
SIDEWALK WITH PLANTING STRIP



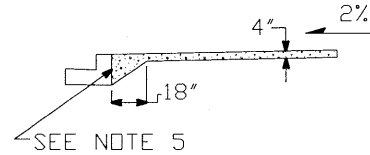
COMBINATION SIDEWALK



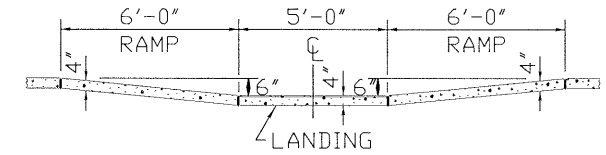
SIDEWALK RAMP-TYPE 2



CROSS SECTION
OF SIDEWALK RAMP



TYPICAL SECTION
WITHIN RADIUS OF CURB



TYPICAL SECTION OF
SIDEWALK RAMP-TYPE 2

NOTES:

1. A MINIMUM 3' WIDE ACCESSIBLE ROUTE SHALL BE MAINTAINED IN ALL PEDESTRIAN ACCESSIBLE AREAS.
2. THE RAMP CENTERLINE SHALL BE PARALLEL TO THE DIRECTION OF THE CROSSING.
3. LANDING SHALL BE A MINIMUM OF 4' IN DEPTH.
4. THICKENED EDGE SHALL BE CONSTRUCTED TO FULL DEPTH OF ADJACENT CURB ALONG THE ENTIRE RADIUS OF CURB.
5. FOR DETECTABLE WARNING PATTERN DETAILS REFER TO STANDARD PLAN NO. SU-05A.

GUIDELINES:

1. PEDESTRIAN TRAFFIC SHALL NOT BE DIRECTED INTO ONCOMING TRAFFIC.
2. PEDESTRIAN TRAFFIC SHALL BE DIRECTED IN FRONT OF THE STOP BAR.
3. PEDESTRIAN TRAFFIC SHALL NOT BE DIRECTED BEHIND MARKED CROSSWALK.
4. PEDESTRIAN TRAFFIC SHOULD BE ALIGNED TO OPPOSITE RAMP.
5. RAMP ALIGNMENT SHOULD BE CONSISTANT WITH SIDEWALK ALIGNMENT.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

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CITY ENGINEER

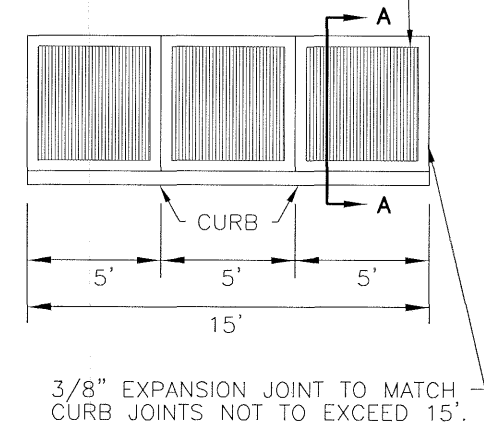
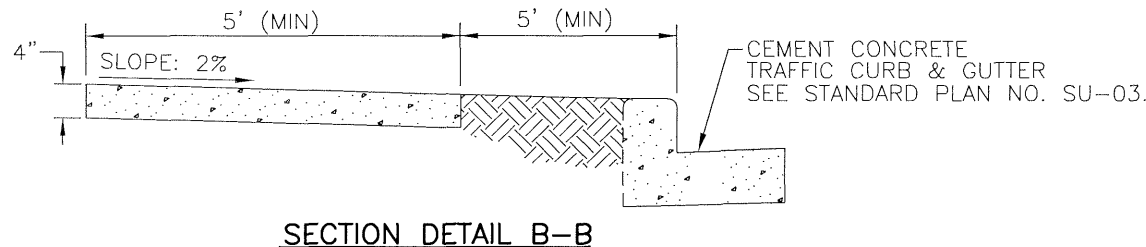
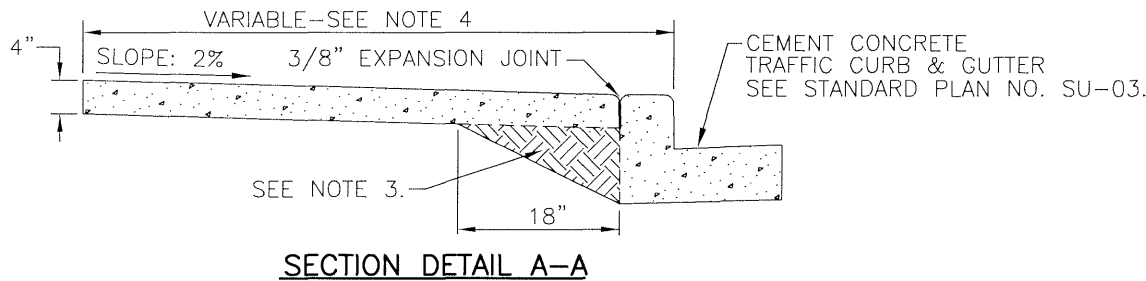
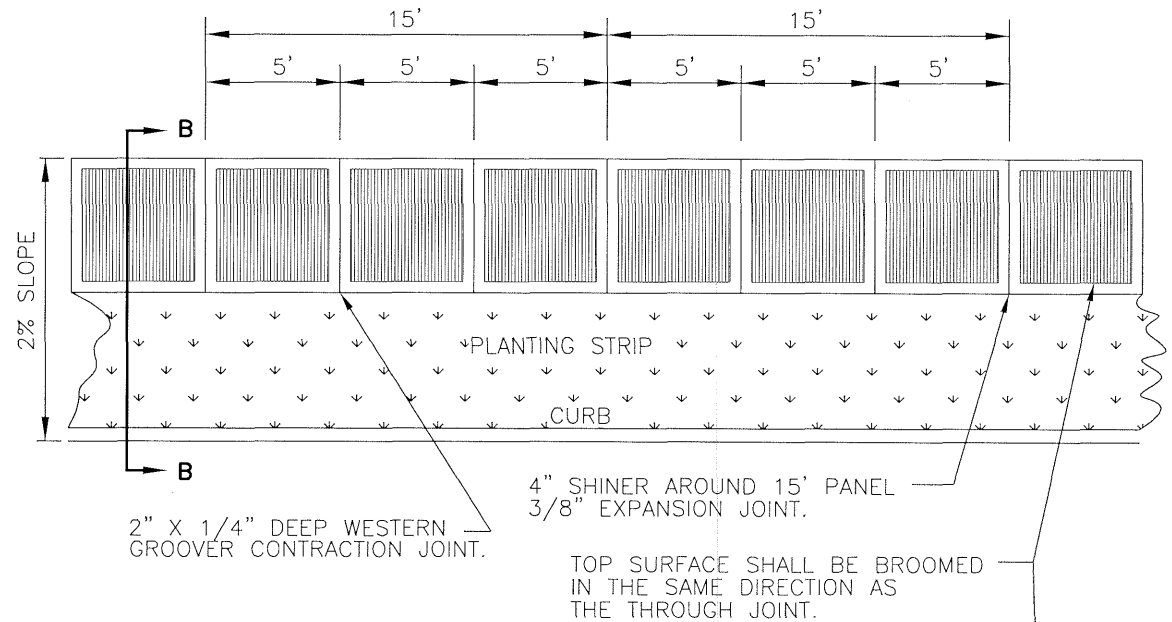

DATE

SIDEWALK RAMP
(GENERAL INFORMATION)

STANDARD PLAN NO. SU-05

NOTES:

1. WHEN PLACING WALK ADJACENT TO EXISTING CURB AND GUTTER. CURB AND GUTTER WILL BE REPAIRED AS NECESSARY BEFORE PLACING CONCRETE FORMS FOR WALK.
2. STAKING REQUIRED WHERE NO CURB IS PRESENT.
3. THICKENED EDGE SHALL BE CONSTRUCTED USING CEMENT CONCRETE ON ALL RADII, ALL OTHER LOCATIONS SHALL BE COMPACTED BACKFILL TO 90% COMPACTION.
4. COMBINATION WALK SHALL BE 7' ON ALL COMMERCIAL SITES AND ARTERIAL STREETS. COMBINATION WALK MINIMUM OF 5'-6" ON NON ARTERIAL STREETS. DIMENSIONS ARE FROM FACE OF CURB TO BACK OF WALK.
5. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.
6. ALL JOINTS SHALL BE CLEANED AND EDGED. EXTERNAL EDGES SHALL BE 1/2" RADIUS. INTERNAL JOINTS SHALL BE 1/4" RADIUS.



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CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER  3/11/04
DATE

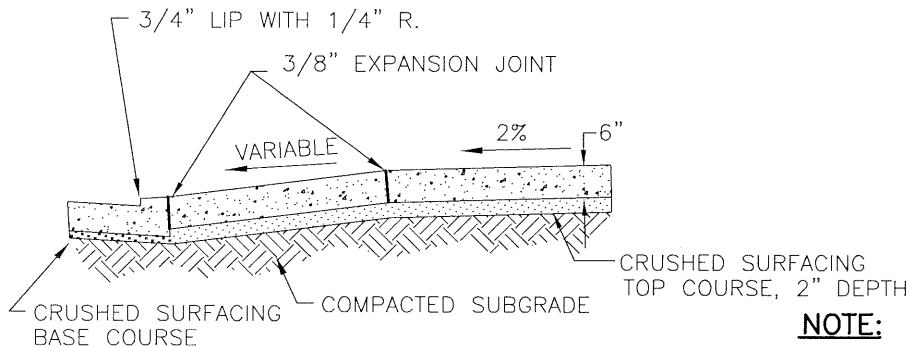
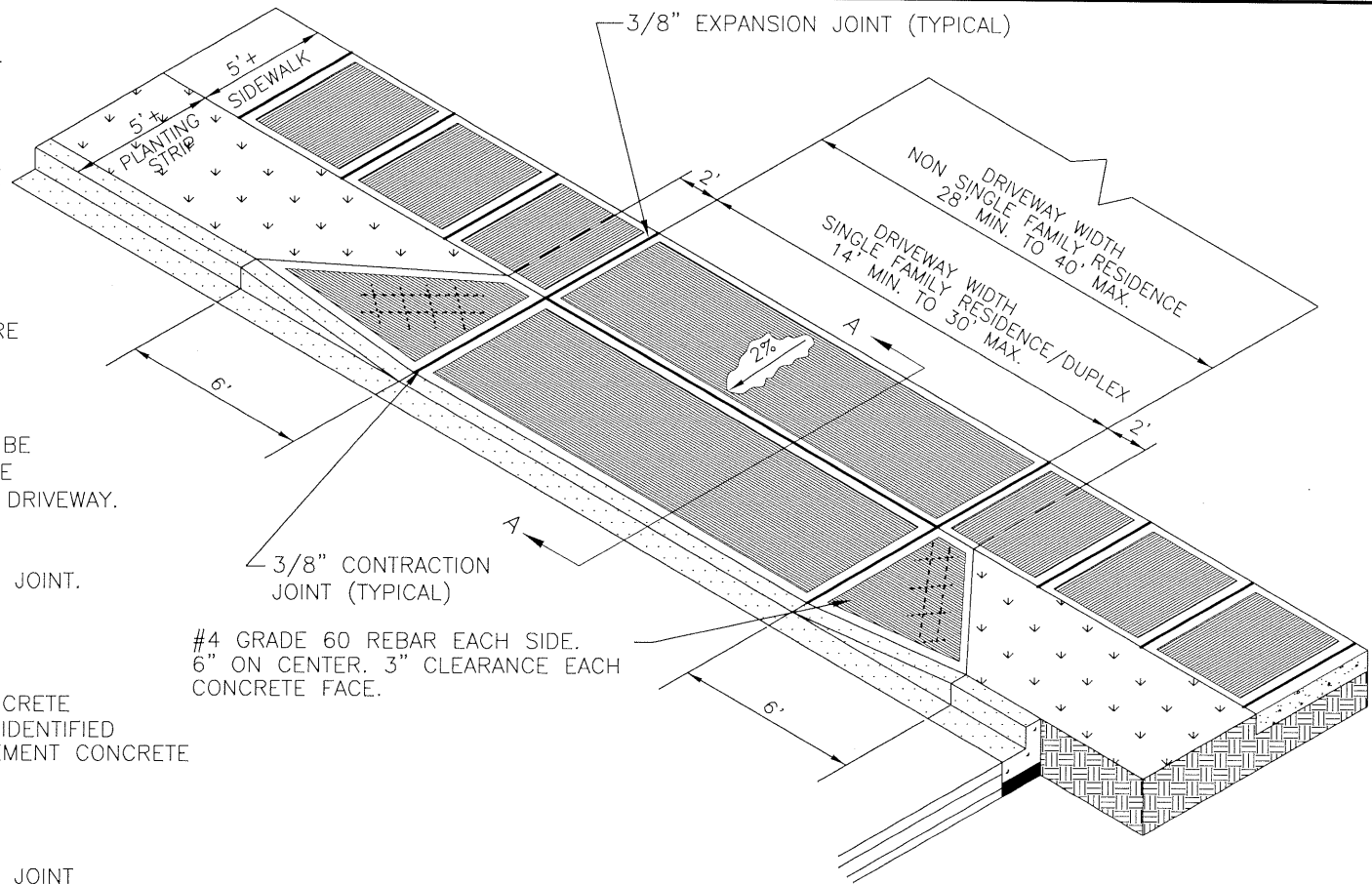
CEMENT CONCRETE
SIDEWALK

STANDARD PLAN NO. SU-04

NOTES:

1. CONCRETE SHALL BE A MINIMUM OF CLASS 3000.
2. ALL JOINTS SHALL BE CLEANED & EDGED. EXTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/2" RADIUS. INTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/4" RADIUS.
3. DRIVEWAYS WIDER OR NARROWER THAN SHOWN ON THIS PLAN REQUIRE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
4. 6" THICK DRIVEWAY SECTION SHALL BE A BRUSHED FINISH IN A TRANSVERSE DIRECTION TO THE CENTER LINE OF DRIVEWAY.
5. DRIVEWAYS WIDER THAN 20' REQUIRE A CENTER LINE EXPANSION JOINT.
6. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.

NOTE: MEASUREMENT FOR CEMENT CONCRETE DRIVEWAY SHALL BE ALL AREAS IDENTIFIED AS 6" THICKNESS EXCLUDING CEMENT CONCRETE CURB & GUTTER. SEE NOTE #4



SECTION DETAIL A-A

NTS

NOTE:

TYPE 1 DRIVEWAY SHALL BE USED WHERE THE PLANTING STRIP WIDTH IS 5' OR GREATER.

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CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

DATE

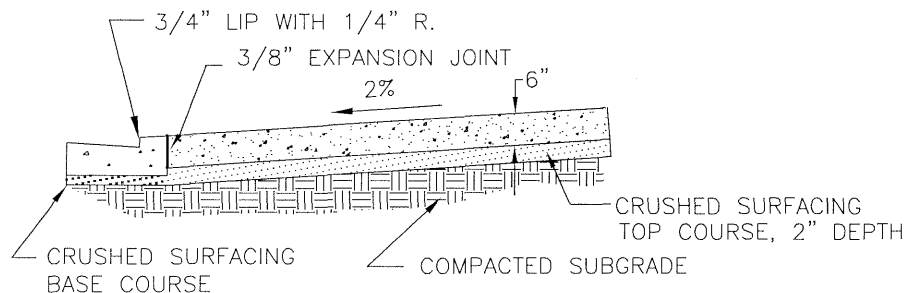
CEMENT CONCRETE
DRIVEWAY ENTRANCE
TYPE 1

STANDARD PLAN NO. SU-07

NOTES:

1. CONCRETE SHALL BE A MINIMUM OF CLASS 3000.
2. ALL JOINTS SHALL BE CLEANED & EDGED. EXTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/2" RADIUS. INTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/4" RADIUS.
3. DRIVEWAYS WIDER OR NARROWER THAN SHOWN ON THIS PLAN REQUIRE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
4. 6" THICK DRIVEWAY SECTION SHALL BE BRUSH FINISHED IN A TRANSVERSE DIRECTION TO THE CENTER LINE OF DRIVEWAY.
5. DRIVEWAYS WIDER THAN 20' REQUIRE A CENTER LINE EXPANSION JOINT.
6. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.

NOTE: MEASUREMENT FOR CEMENT CONCRETE DRIVEWAY SHALL BE ALL AREAS IDENTIFIED AS 6" THICKNESS EXCLUDING CEMENT CONCRETE CURB & GUTTER. SEE NOTE #4

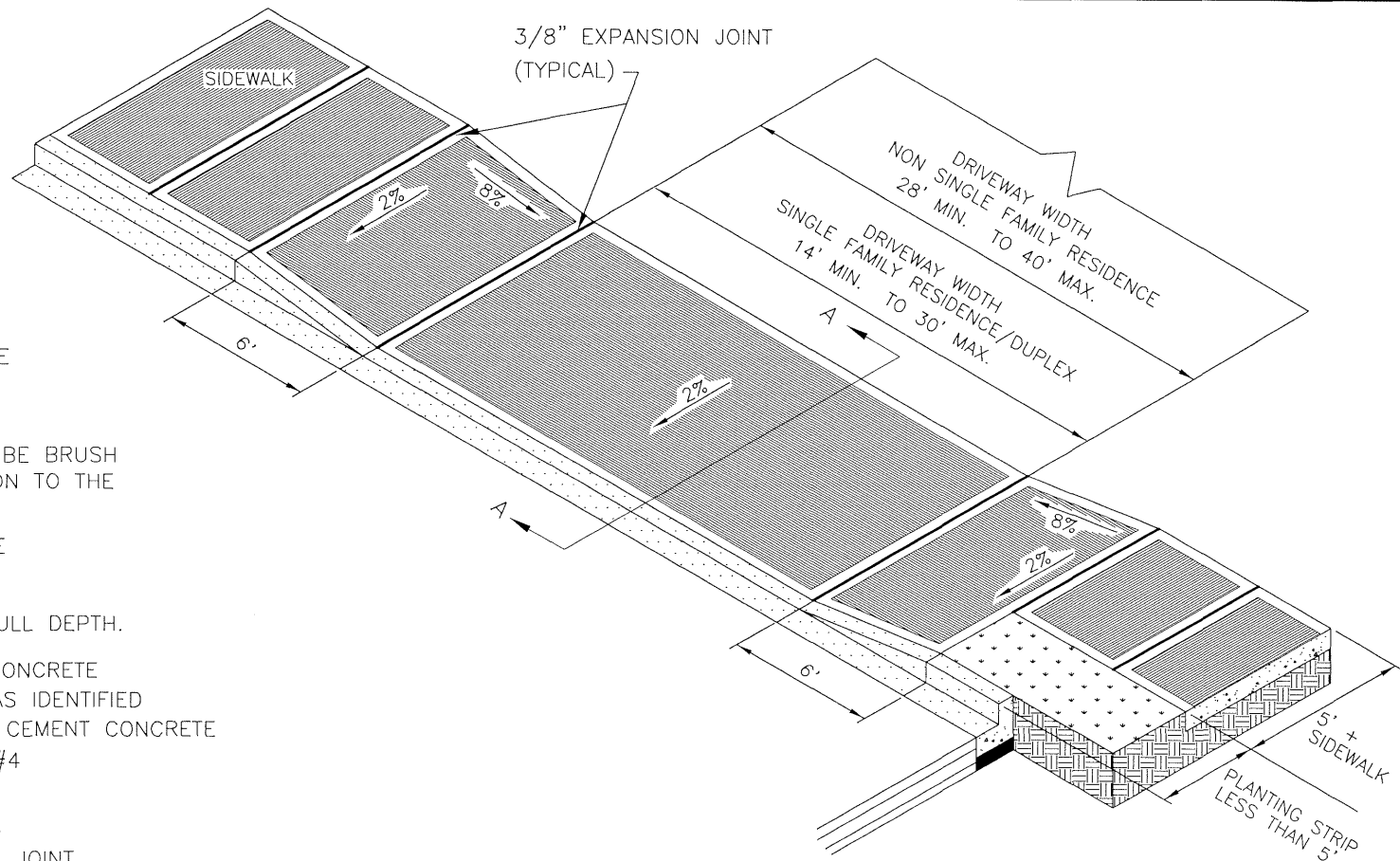


SECTION DETAIL A-A

NTS

NOTE:

TYPE 2 DRIVEWAY SHALL BE USED AT DRIVEWAYS/ALLEYS WHERE THE PLANTING STRIP IS LESS THAN 5' WIDE.



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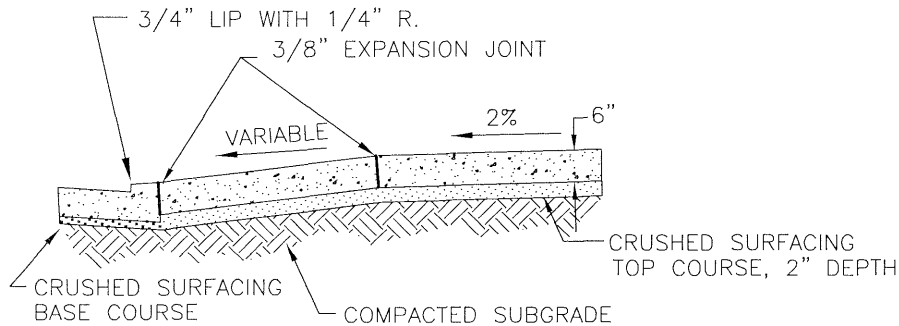
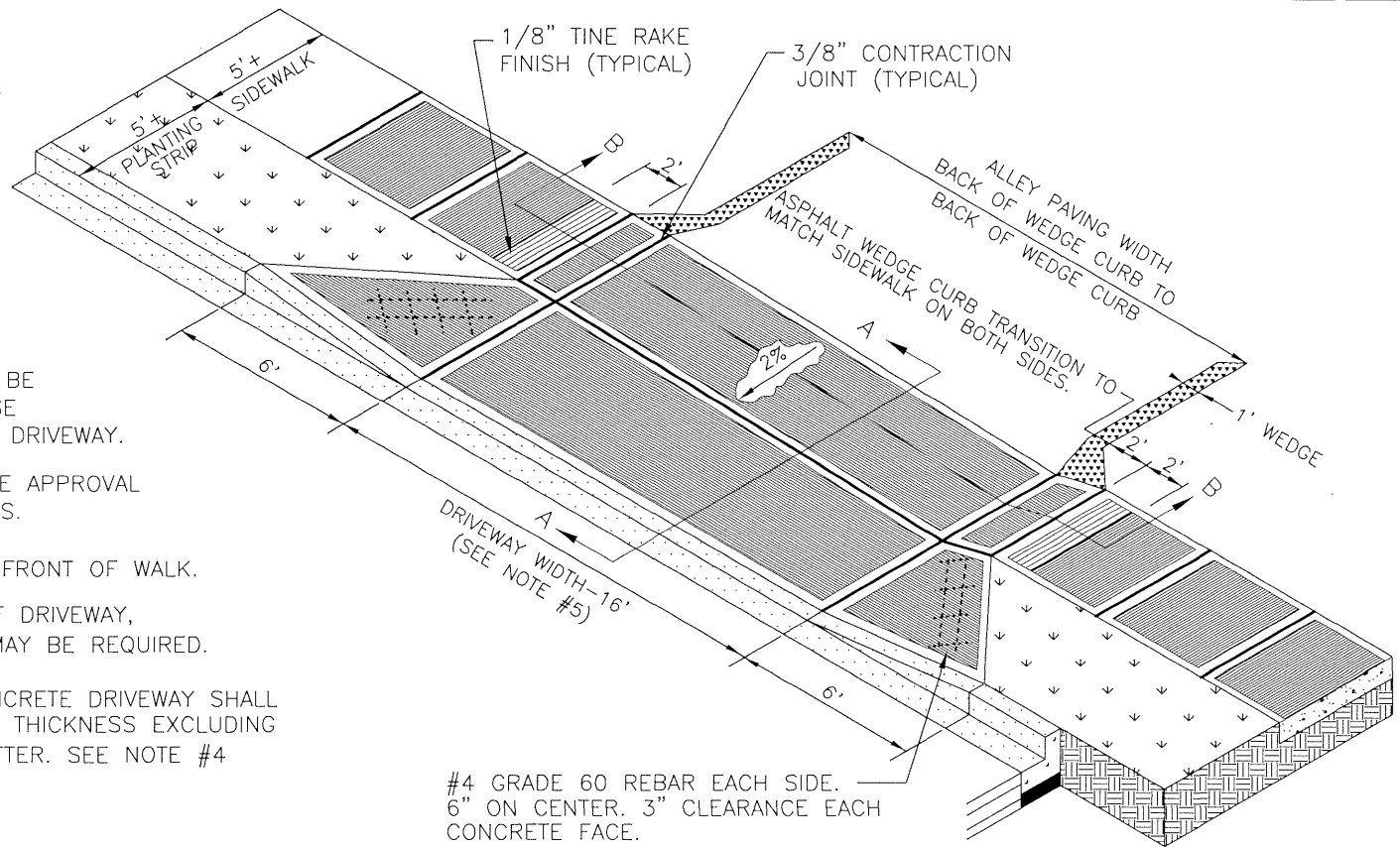
DATE

CEMENT CONCRETE
DRIVEWAY ENTRANCE
TYPE 2
STANDARD PLAN NO. SU-08

NOTES:

1. CONCRETE SHALL BE A MINIMUM OF CLASS 3000.
2. ALL JOINTS SHALL BE CLEANED & EDGED. EXTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/2" RADIUS. INTERNAL JOINTS TO THE DRIVEWAY SHALL BE 1/4" RADIUS.
3. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.
4. 6" THICK DRIVEWAY SECTION SHALL BE A BRUSHED FINISH IN A TRANSVERSE DIRECTION TO THE CENTER LINE OF DRIVEWAY.
5. DRIVEWAYS WIDER THAN 16' REQUIRE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
6. CONCRETE WING SHALL EXTEND TO FRONT OF WALK.
7. DEPENDENT UPON CROSS SLOPE OF DRIVEWAY, ADDITIONAL DRAINAGE PROVISIONS MAY BE REQUIRED.

NOTE: MEASUREMENT FOR CEMENT CONCRETE DRIVEWAY SHALL BE ALL AREAS IDENTIFIED AS 6" THICKNESS EXCLUDING CEMENT CONCRETE CURB & GUTTER. SEE NOTE #4

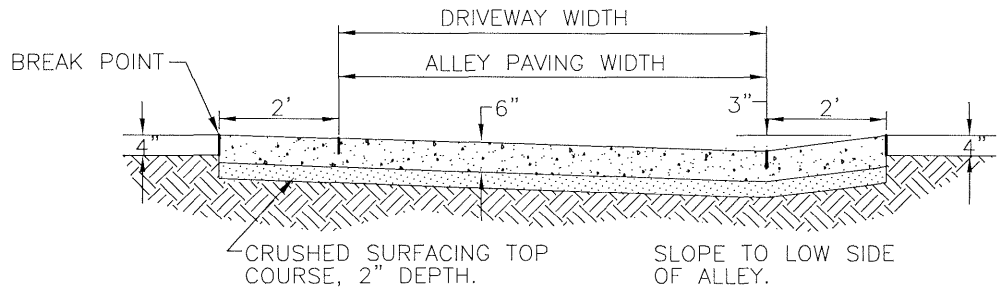


SECTION DETAIL A-A

NTS

NOTE:

TYPE 3 DRIVEWAY SHALL BE USED AT ALLEYS WHERE THE PLANTING STRIP IS 5' WIDE OR GREATER.



SECTION DETAIL B-B

NTS

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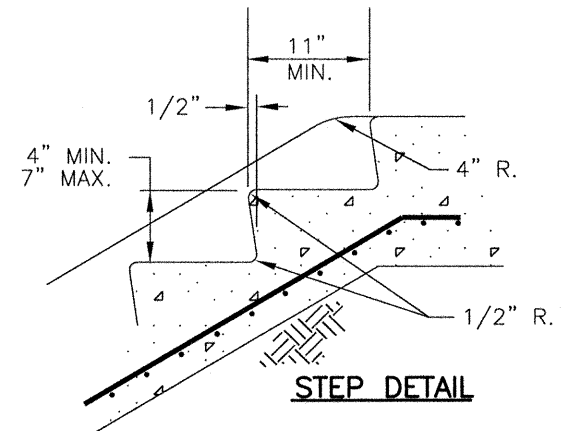
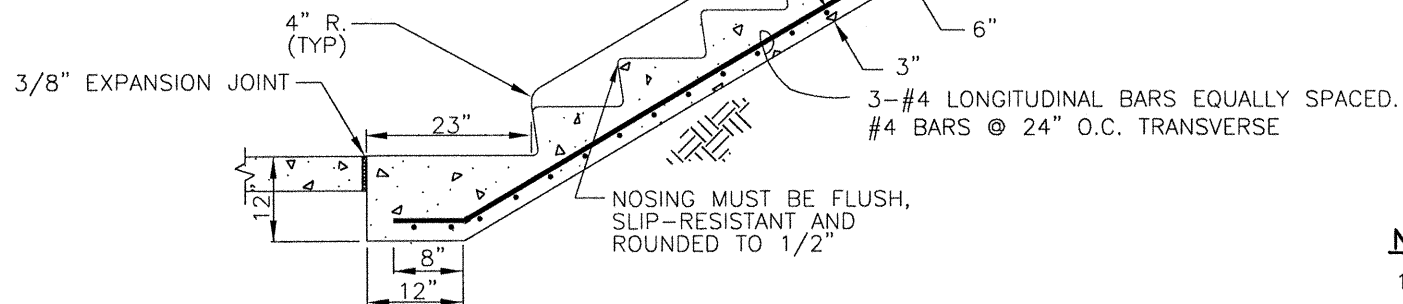
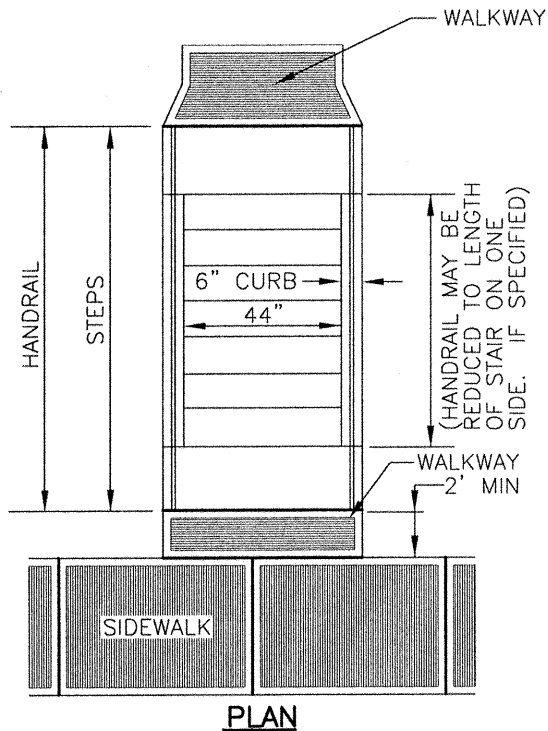
CITY ENGINEER

DATE

CEMENT CONCRETE
DRIVEWAY ENTRANCE
TYPE 3

STANDARD PLAN NO. SU-09

MEASUREMENT FOR PAYMENT
HORIZONTAL LENGTH



NOTES:

1. FOR STAIRWAY HANDRAIL DETAILS, REFER TO STANDARD PLAN NO. SU-11.
2. CEMENT CONCRETE SHALL BE CLASS 3,000.

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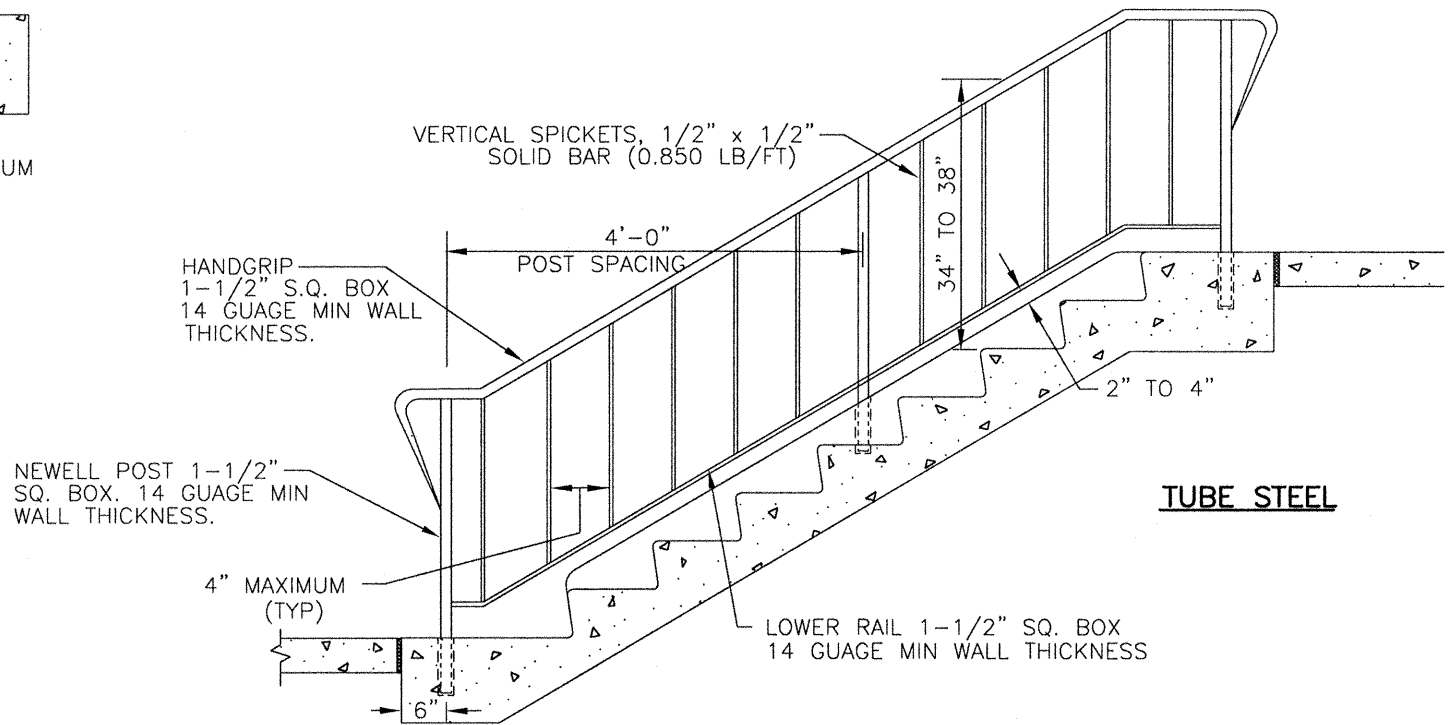
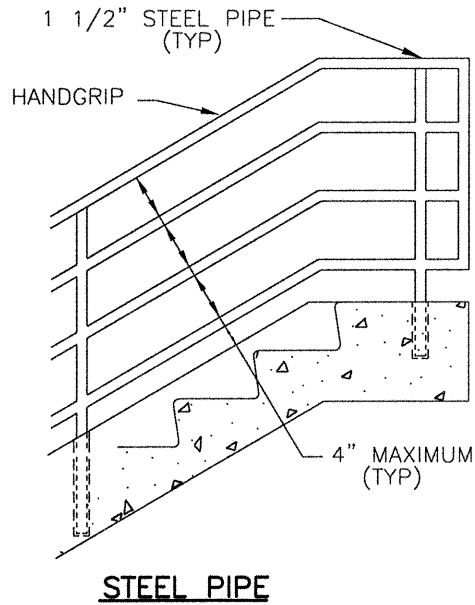
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CITY ENGINEER

DATE 2/4/03

CEMENT CONCRETE STAIRWAY

STANDARD PLAN NO. SU-10



NOTE:

FOR CEMENT CONCRETE STAIRWAY DETAILS, REFER TO STANDARD PLAN NO. SU-10

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DATE 2/4/03

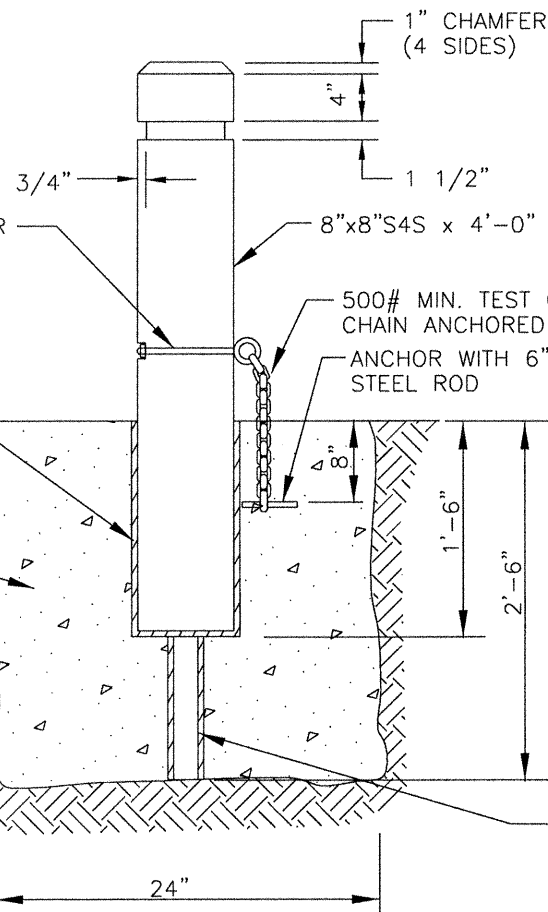
STAIRWAY HANDRAIL

STANDARD PLAN NO. SU-11

1/2" GALVANIZED EYE BOLT W/WASHER
AND NUT. RECESS NUT AND PEEN
BOLT THREADS.

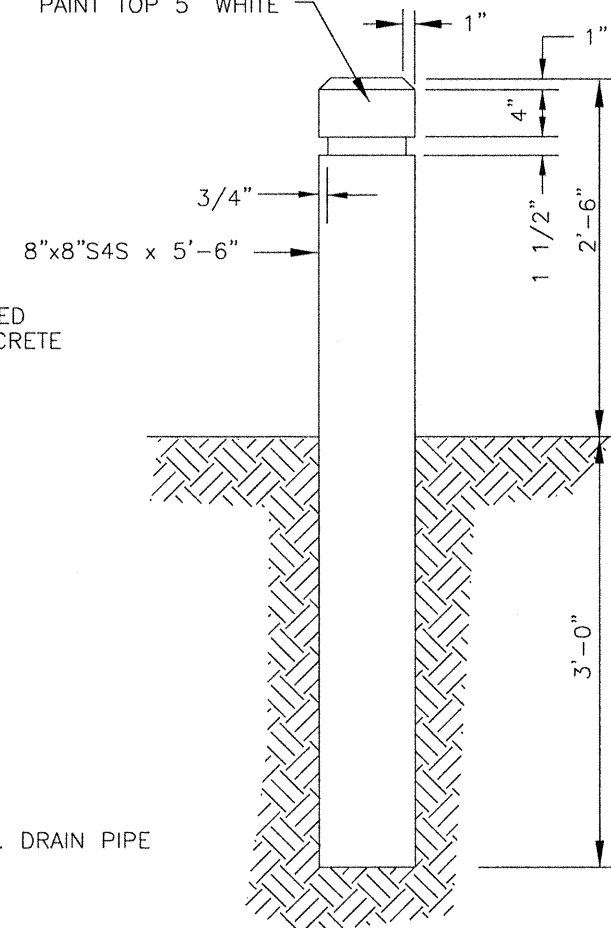
1/8" MIN. THICKNESS GALVANIZED
STEEL. INTERIOR SIDE DIMENSIONS
1/2" GREATER THAN POST
DIMENSIONS.

CLASS 3000 CONCRETE



REMOVABLE BOLLARD

PAINT TOP 5" WHITE



FIXED BOLLARD

NOTES:

1. TIMBER SHALL BE DOUGLAS FIR, DENSE CONSTRUCTION GRADE, AND SHALL BE PRESSURE TREATED
2. STEEL TUBE SHALL CONFORM TO ASTM A53 OR ASTM A53 GRADE A.
3. NUTS, BOLTS, & WASHERS SHALL CONFORM TO ASTM A307.
4. ALL STEEL PARTS SHALL BE GALVANIZED.

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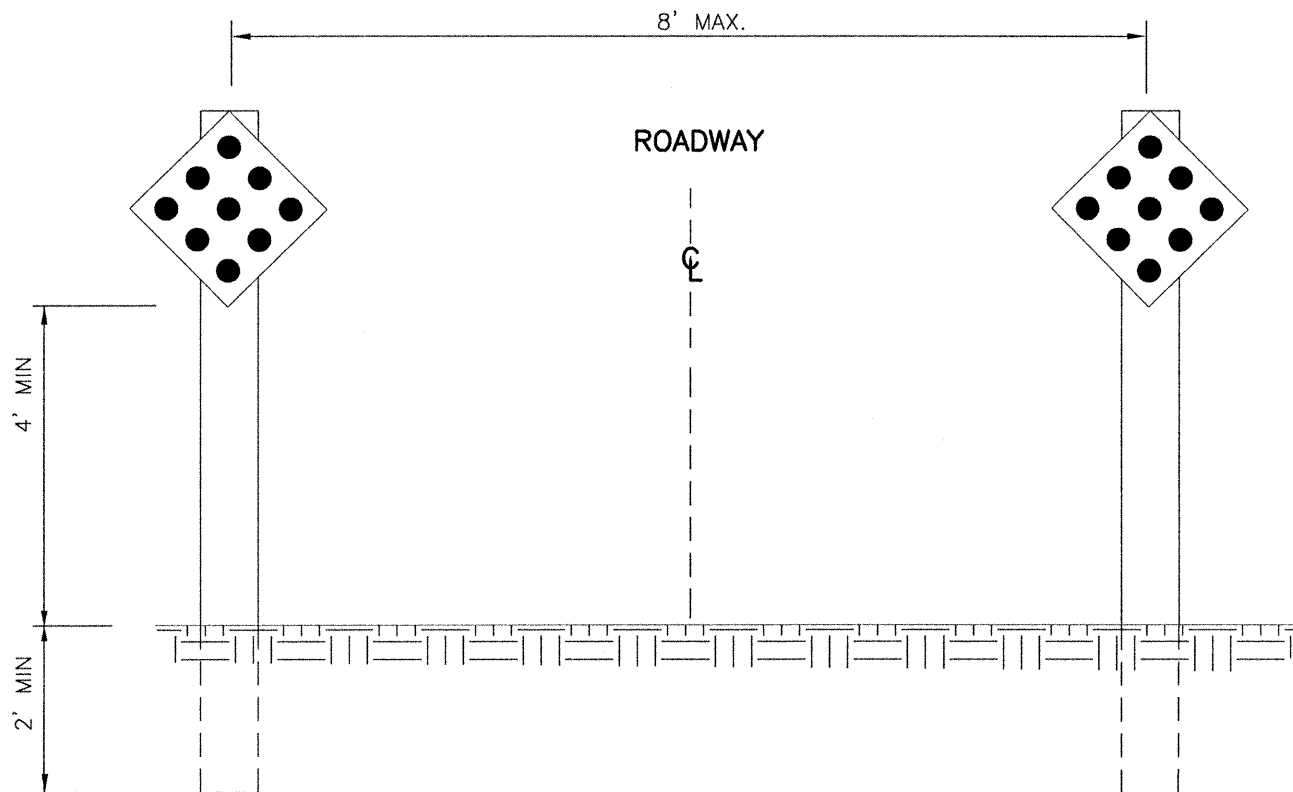
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

DATE 2/4/03

BOLLARD DETAILS

STANDARD PLAN NO. SU-12



NOTES:

1. 4"x4"x8' WOODEN POSTS SHALL BE WESTERN RED CEDAR OR PRESSURE TREATED WOOD.
2. HARDWARE FOR MOUNTING SIGNS SHALL BE HOT DIPPED GALVANIZED 5/16" X 2" HEX HEAD LAG SCREWS. THE WASHERS SHALL BE USS F/W 5/16" ZINC.
3. THE END-OF-ROAD MARKER SHALL BE ONE OF THE FOLLOWING:
A MARKER CONSISTING OF NINE RED RETROREFLECTORS, WITH A MINIMUM DIAMETER OF 3 IN., MOUNTED SYMMETRICALLY ON A RED DIAMOND PANEL 18 IN. ON A SIDE (OM4-1); OR A RETROREFLECTIVE RED DIAMOND PANEL 18 IN. ON A SIDE (OM4-3).

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DEPARTMENT OF PUBLIC WORKS**

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CITY ENGINEER

DATE 2/4/03

END OF ROAD MARKER

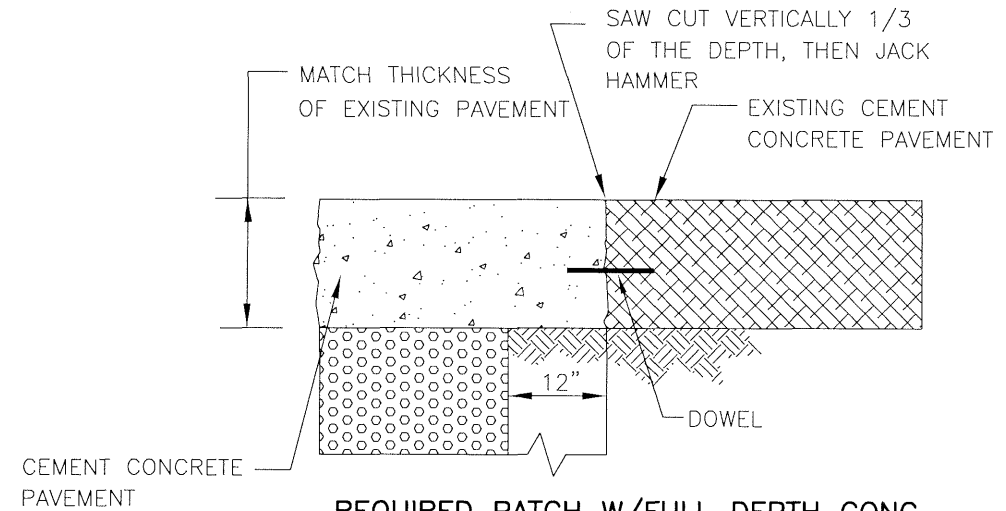
STANDARD PLAN NO. SU-13

NOTES

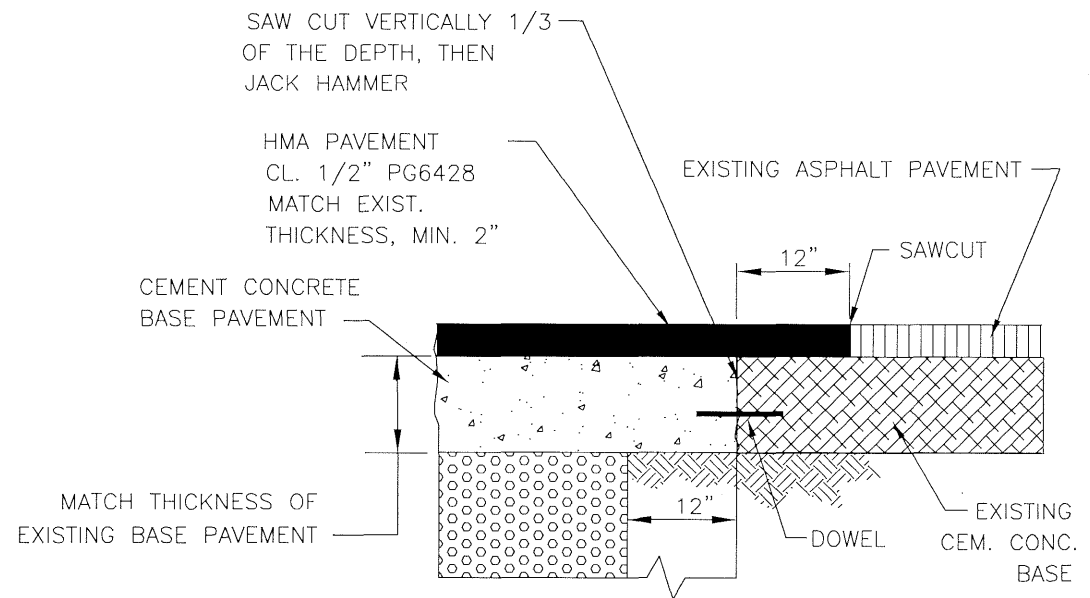
1. IF REMAINING PAVEMENT ADJACENT TO THE PATCH IS LESS THAN 3' WIDE, REMOVE AND REPLACE TO MATCH EXISTING PAVEMENT.
2. CONCRETE PAVEMENT OR CONCRETE BASE SHALL NOT BE PLACED OVER CDF UNTIL APPROVED BY THE ENGINEER.
3. THE EDGES OF THE EXISTING ASPHALT PAVEMENT AND CASTINGS SHALL BE PAINTED WITH HOT ASPHALT CEMENT OR ASPHALT EMULSION IMMEDIATELY BEFORE PLACING THE ASPHALT PATCHING MATERIAL.
4. ALL JOINTS BETWEEN THE NEW AND ORIGINAL ASPHALT PAVEMENT SHALL BE PAINTED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH DRY PAVING SAND BEFORE THE ASPHALT SOLIDIFIES.
5. TEMPORARY PATCHES BETWEEN OCTOBER 1 AND MARCH 31 SHALL BE MADE WITH HMA PAVEMENT UNLESS OTHERWISE APPROVED.
6. CEMENT CONCRETE PAVEMENT AND BASE PAVEMENT SHALL BE CLASS 3000.
7. DOWEL IN ACCORDENCE WITH STATE STANDARD PLAN A-1.
8. ALL PERMANENT FINAL PATCHES SHALL BE RECTANGULAR OR CIRCULAR IN SHAPE AND CONSTRUCTED TO BE PARALLEL AND PERPENDICULAR TO THE ROAD CENTERLINE.

NOTE

REFER TO STANDARD PLAN NO. SU-16 FOR BACKFILL REQUIREMENTS.



REQUIRED PATCH W/FULL DEPTH CONC.



REQUIRED PATCH W/ASPALT OVER CONC.

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DEPARTMENT OF PUBLIC WORKS

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CITY ENGINEER

3/11/04
DATE

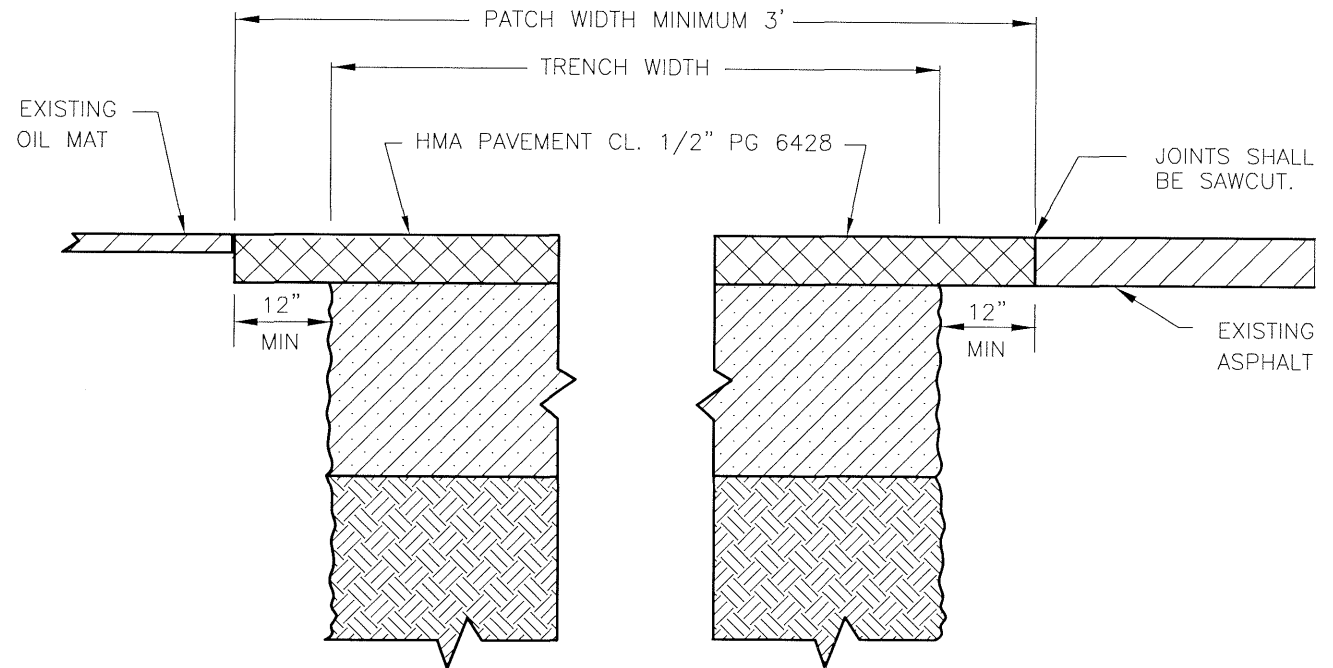
TYPICAL TRENCH PATCH FOR
CEMENT CONCRETE PAVEMENT
AND BASE
STANDARD PLAN NO. SU-14

NOTES

1. IF REMAINING PAVEMENT ADJACENT TO THE PATCH IS LESS THAN 3' WIDE, REMOVE AND REPLACE WITH ASPHALT CONCRETE PAVEMENT TO MATCH EXISTING (MINIMUM 2 IN.).
2. HMA PAVEMENT SHALL NOT BE PLACED OVER CDF UNTIL APPROVED BY THE ENGINEER.
3. THE EDGES OF THE EXISTING ASPHALT PAVEMENT AND CASTINGS SHALL BE PAINTED WITH HOT ASPHALT CEMENT OR ASPHALT EMULSION IMMEDIATELY BEFORE PLACING THE ASPHALT PATCHING MATERIAL.
4. ALL JOINTS BETWEEN THE NEW AND ORIGINAL ASPHALT PAVEMENT SHALL BE PAINTED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH DRY PAVING SAND BEFORE THE ASPHALT SOLIDIFIES.
5. TEMPORARY PATCHES BETWEEN OCTOBER 1 AND MARCH 31 SHALL BE MADE WITH HMA PAVEMENT UNLESS OTHERWISE APPROVED.
6. ALL PERMANENT FINAL PATCHES SHALL BE RECTANGULAR OR CIRCULAR IN SHAPE AND CONSTRUCTED TO BE PARALLEL AND PERPENDICULAR TO THE ROAD CENTERLINE.

NOTE

REFER TO STANDARD PLAN NO. SU-16 FOR BACKFILL REQUIREMENTS



TRENCH PATCH REQUIREMENTS

	TRENCH WIDTH	
	GREATER THAN 24 IN.	LESS THAN OR EQUAL TO 24 IN.
WEARING SURFACE	MATCH EXISTING (2 IN. MIN.)	MATCH EXISTING (2 IN. MIN.)
PAVING BASE	CRUSHED SURFACE TOP COURSE DEPTH 12 IN.	CDF OR CRUSHED SURFACE TOP COURSE FULL DEPTH OF TRENCH

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

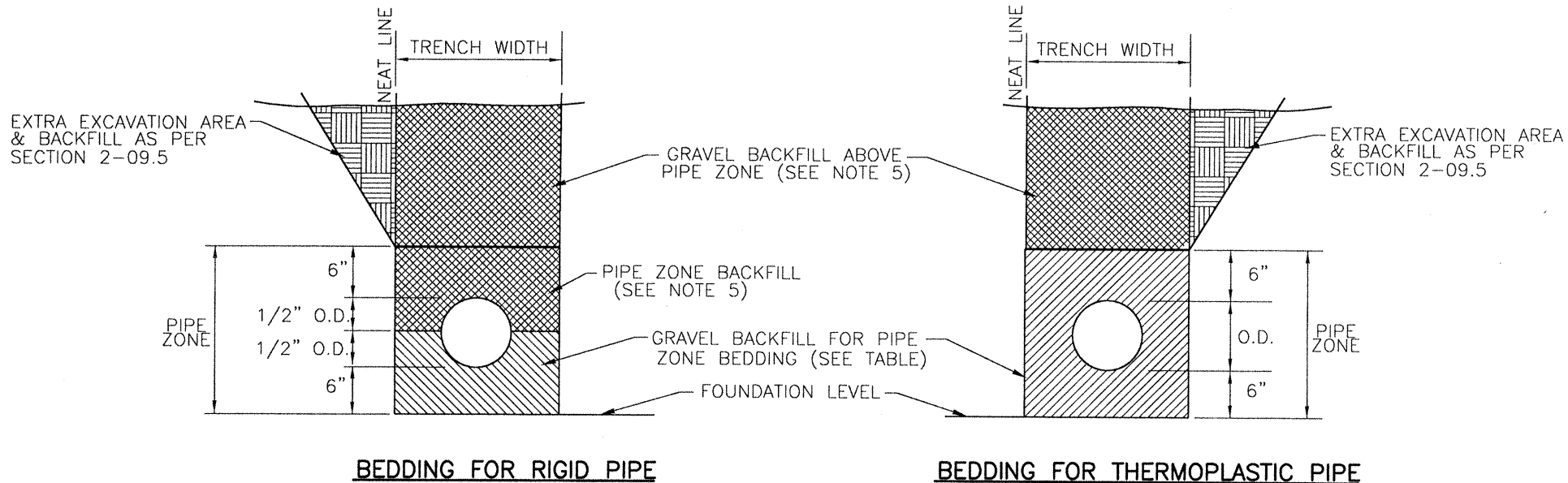
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CITY ENGINEER

3/11/04
DATE

TYPICAL TRENCH PATCH FOR
ASPHALT CONCRETE/OIL MAT
PAVEMENT

STANDARD PLAN NO. SU-15



GRAVEL BACKFILL FOR PIPE ZONE BEDDING

SIEVE SIZE	PERCENT PASSING
3/4" SQUARE	100
3/8" SQUARE	95-100
U.S. NUMBER 8	0-10
U.S. NUMBER 200	0-3
SAND EQUIVALENT	35 MINIMUM

NOTES:

1. PROVIDE UNIFORM SUPPORT UNDER BARREL.
2. HAND TAMP UNDER HAUNCHES.
3. COMPACT BEDDING AND BACKFILL MATERIAL TO 95% MAX. DENSITY EXCEPT DIRECTLY OVER PIPE. HAND TAMP ONLY.
4. TRENCH WIDTH SHALL BE AS SPECIFIED IN SECTION 2-09.4 OF THE STANDARD SPECIFICATIONS.
5. SEE STANDARD SPECIFICATION SECTION 9-03.12(2) FOR MATERIAL REQUIREMENTS ON "PIPE ZONE BACKFILL" AND FOR "BACKFILL ABOVE PIPE ZONE".

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

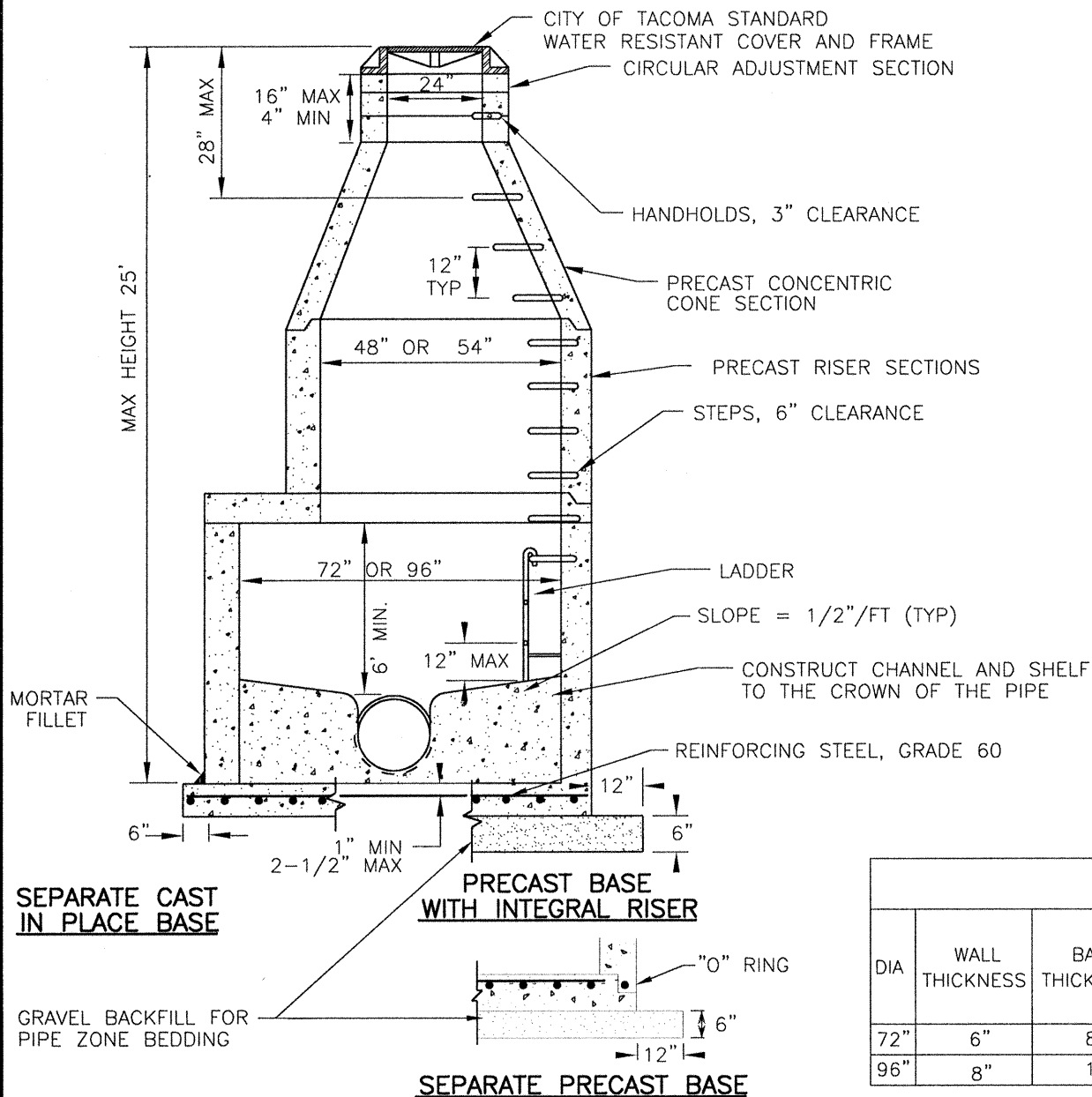
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CITY ENGINEER

DATE

PIPE BEDDING AND BACKFILL
FOR SANITARY AND STORM
SEWERS

STANDARD PLAN NO. SU-16



NOTES:

1. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM TO 2-1/2" MAXIMUM.
2. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS AND TOP SLABS. SEE STANDARD PLAN NO. SU-21.
3. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CL. 3000. ALL PRECAST CONCRETE SHALL BE CL. 4000.
4. RUBBER GASKETS SHALL BE USED IN TONGUE AND GROOVE JOINTS OF PRE-CAST SECTIONS.
5. A FLEXIBLE PIPE-TO-MANHOLE CONNECTOR SHALL BE EMPLOYED IN ALL CONNECTIONS OF RIGID AND FLEXIBLE PIPES TO NEW PRECAST CONCRETE MANHOLES. THE CONNECTOR SHALL BE "KOR-N-SEAL" WITH "WEDGE KORBAND" (TYPE I OR II AS REQUIRED FOR PIPE DIAMETER) MANUFACTURED BY NAC, INC). OR APPROVED EQUAL.

MANHOLE DIMENSION TABLE

DIA	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL SQ IN/FT EACH DIRECTION	
					INTEGRAL BASE	SEPARATE BASE
72"	6"	8"	60"	12"	0.24	0.35
96"	8"	12"	84"	12"	0.29	0.39

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DEPARTMENT OF PUBLIC WORKS

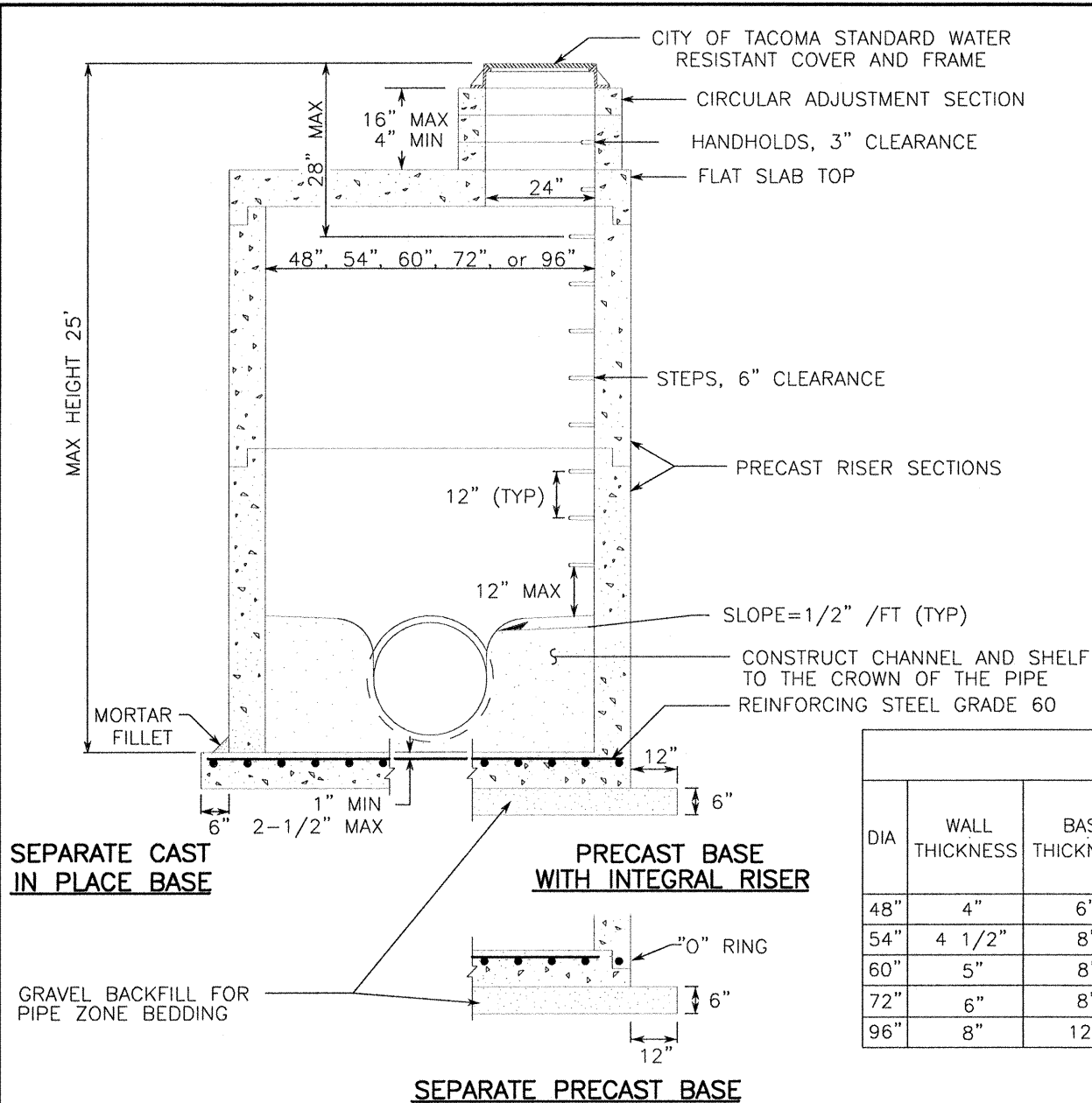
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CITY ENGINEER

DATE 2/4/03

MANHOLE-TYPE 2
72" AND 96"

STANDARD PLAN NO. SU-18



NOTES:

1. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM TO 2-1/2" MAXIMUM.
2. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS AND TOP SLABS. SEE STANDARD PLAN NO. SU-21.
3. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CL. 3000. ALL PRECAST CONCRETE SHALL BE CL. 4000.
4. RUBBER GASKETS SHALL BE USED IN TOUNG AND GROOVE JOINTS OF PRE-CAST SECTIONS.
5. A FLEXIBLE PIPE-TO-MANHOLE CONNECTOR SHALL BE EMPLOYED IN ALL CONNECTIONS OF RIGID AND FLEXIBLE PIPES TO NEW PRECAST CONCRETE MANHOLES. THE CONNECTOR SHALL BE "KOR-N-SEAL" WITH "WEDGE KORBAND" (TYPE I OR II AS REQUIRED FOR PIPE DIAMETER) MANUFACTURED BY NPC, INC). OR APPROVED EQUAL.

MANHOLE DIMENSION TABLE

DIA	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL SQ IN/FT EACH DIRECTION	
					INTEGRAL BASE	SEPARATE BASE
48"	4"	6"	36"	8"	0.15	0.23
54"	4 1/2"	8"	42"	8"	0.19	0.19
60"	5"	8"	48"	8"	0.25	0.25
72"	6"	8"	60"	12"	0.24	0.35
96"	8"	12"	84"	12"	0.29	0.39

SEPARATE PRECAST BASE

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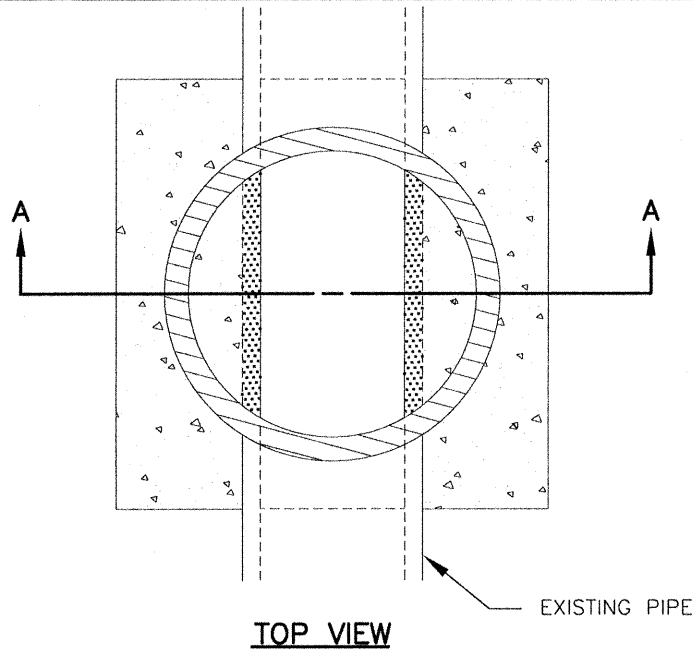
**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

CITY ENGINEER

DATE 2/4/03

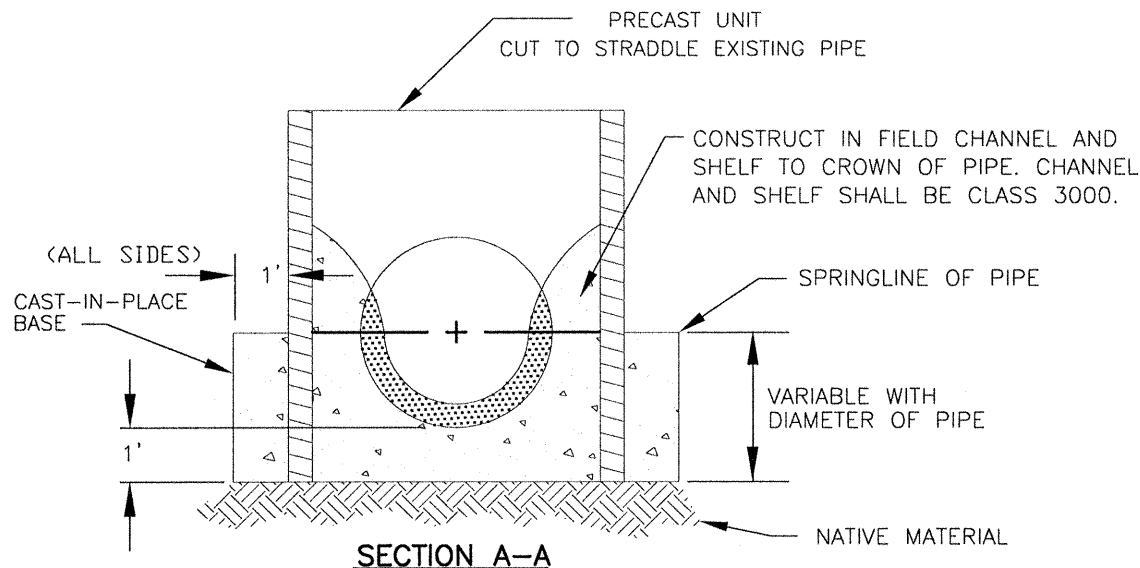
MANHOLE TYPE 3

STANDARD PLAN NO. SU-19



NOTES:

1. EXISTING PIPE SHALL BE SUPPORTED AT ALL TIMES.
2. NO WEIGHT OF THE PRECAST UNIT SHALL BEAR ON THE EXISTING PIPE.
3. CONCRETE FOR CAST-IN-PLACE BASE SHALL BE CLASS 4000.
4. CAST-IN-PLACE BASE SHALL BE POURED TO ENCASE THE PRECAST UNIT.
5. PRECAST MANHOLE SECTION SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD PLAN FOR THE SPECIFIED MANHOLE SIZE AND TYPE.
6. ADDITIONAL MANHOLE SECTIONS SHALL NOT BE INSTALLED UNTIL CONCRETE BASE HAS SET FOR 12 HOURS.
7. THE EXISTING MAIN SHALL BE LEFT IN PLACE AND THE TOP PORTION OF THE MAIN SHALL BE REMOVED. THE BOTTOM PORTION SHALL BE TIED IN AS THE CHANNEL OF THE NEW MANHOLE.
8. GROUT ALL OPENINGS TO ENSURE WATER TIGHT STRUCTURE.



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DEPARTMENT OF PUBLIC WORKS**

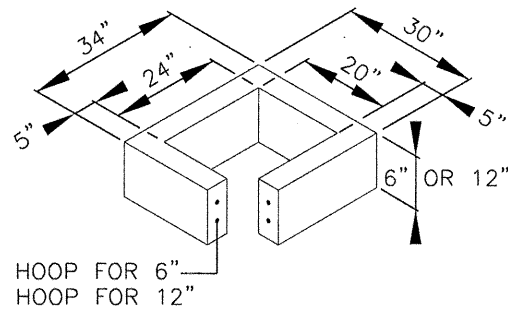
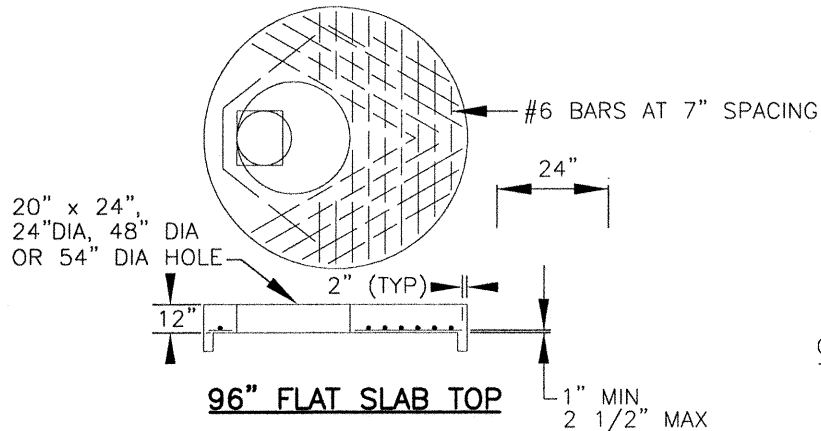
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CITY ENGINEER

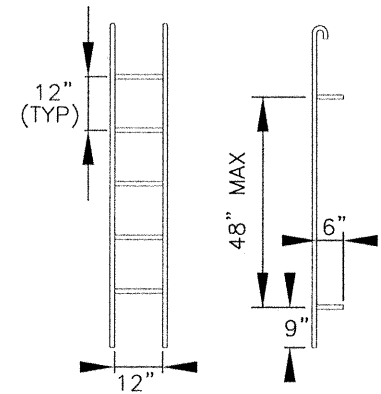
DATE 2/4/03

**CAST-IN-PLACE
MANHOLE BASE**

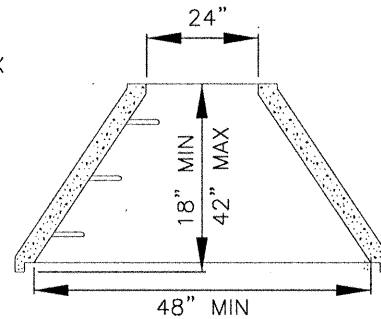
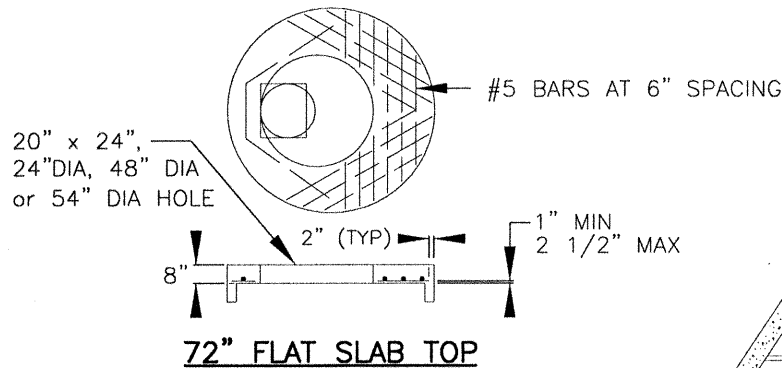
STANDARD PLAN NO. SU-20



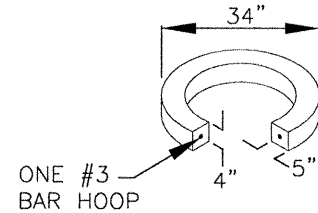
**RECTANGULAR ADJUSTMENT
SECTION**



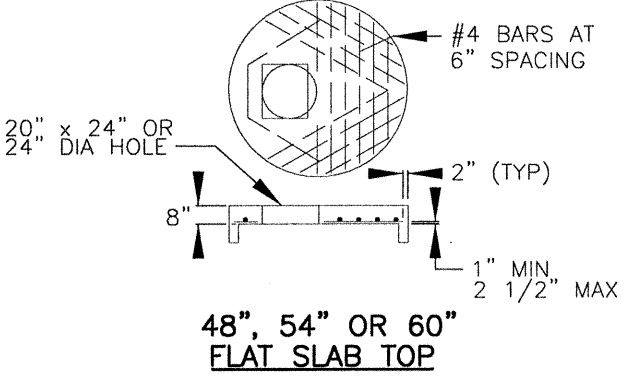
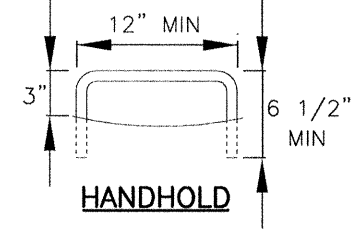
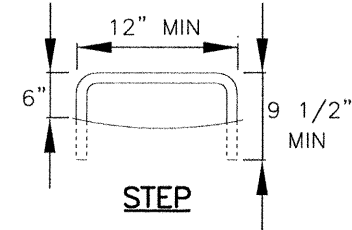
PREFABRICATED LADDER



CONCENTRIC CONE SECTION



**CIRCULAR ADJUSTMENT
SECTION**



NOTES

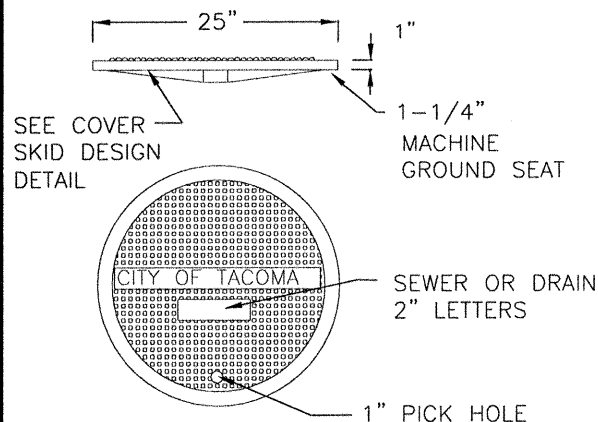
1. AS AN ACCEPTABLE ALTERNATE TO REBAR, WIRE MESH HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED FOR ADJUSTMENT SECTIONS.

CITY OF TACOMA
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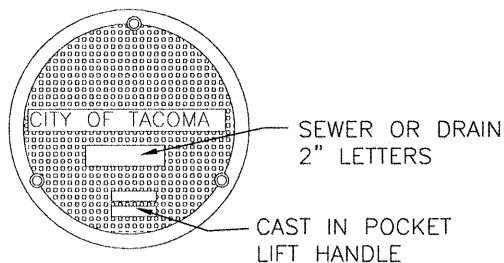
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CITY ENGINEER  DATE 2/14/03 2/4/03

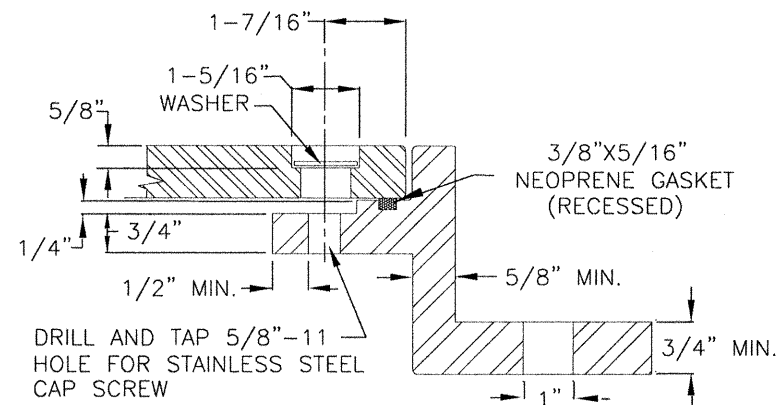
MISCELLANEOUS DETAILS
FOR MANHOLES AND
CATCH BASINS
STANDARD PLAN NO. SU-21



WATER RESISTANT LID

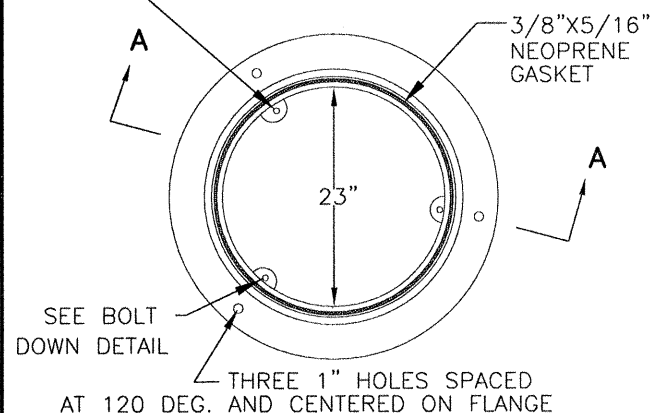


WATER TIGHT LID

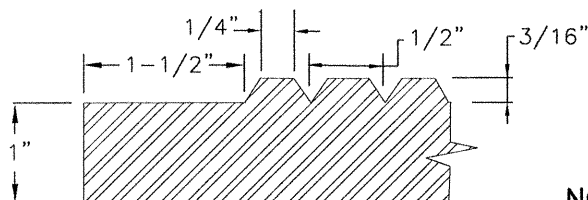


**BOLT-DOWN WATER TIGHT
DETAIL**

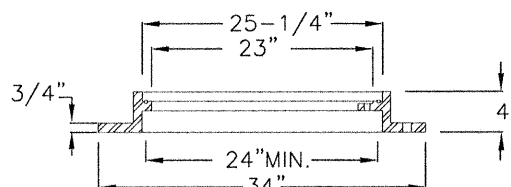
THREE HOLES SPACED AT 120 DEG.
ON A RADIUS OF 11-1/16"
DRILL AND TAP 5/8"-11 HOLE
FOR STAINLESS STEEL SOCKET
HEAD CAP SCREW



FRAME



**COVER SKID DESIGN
DETAIL**



Section A-A

NOTES:

- COVERS SHALL HAVE THE WORD "SEWER" IN 2 INCH RAISED LETTERS WHEN USED WITH SANITARY SEWER INSTALLATIONS, OR "DRAIN" WHEN INSTALLED WITH STORM SEWERS. ALL COVERS SHALL HAVE THE WORDS "CITY OF TACOMA" IN 1-1/2 INCH RAISED LETTERS AND THE WORDS "CONFINED SPACE" IN 1-INCH RAISED LETTERS.
- LIDS MUST BE INTERCHANGEABLE, ANY LID SHALL FIT ANY AND ALL FRAMES. PROPRIETARY MANHOLE COVERS WITHOUT BOTTOM RIBS ARE ACCEPTABLE, PROVIDED THEY MEET THE STANDARD SPECIFICATIONS REQUIREMENTS FOR "METAL CASTINGS."
- FRAME SHALL HAVE NEOPRENE GASKET AND SHALL BE DRILLED AND TAPPED FOR BOTH WATER TIGHT & WATER RESISTANT APPLICATIONS.

**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

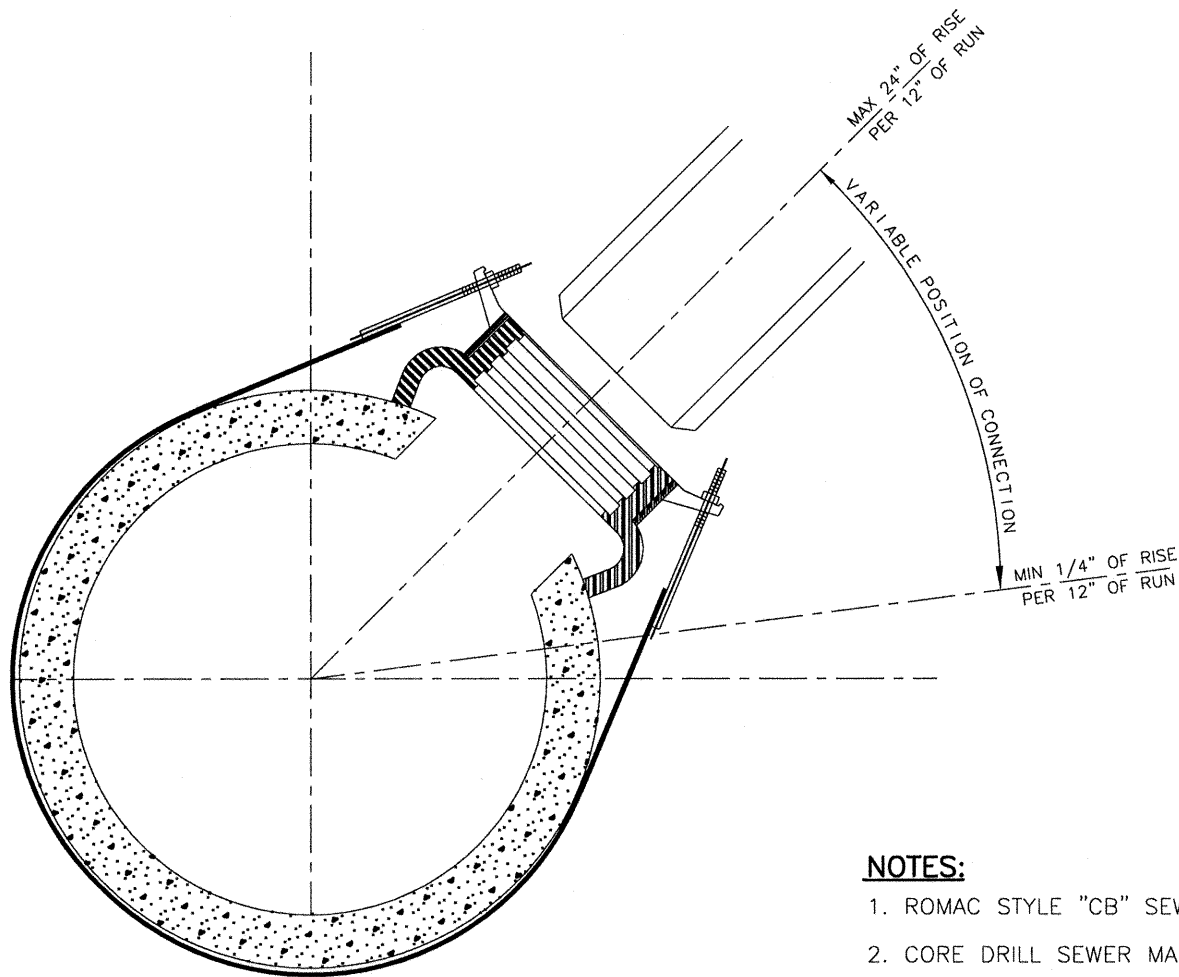
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DATE 2/4/03

MANHOLE FRAME AND COVER

STANDARD PLAN NO. SU-22



**SANITARY SEWER MAIN
CROSS SECTION**

NOTES:

1. ROMAC STYLE "CB" SEWER SADDLE OR APPROVED EQUAL.
2. CORE DRILL SEWER MAIN.
3. PORTIONS OF THE CITY'S SANITARY SEWER SYSTEM HAVE BEEN LINED. IF DURING CONNECTION OF THE NEW SIDE SEWER, A LINED PIPE IS ENCOUNTERED, THE CONSTRUCTION DIVISION SHALL BE CONTACTED AT 591-5760 FOR FURTHER INSTRUCTIONS.
4. SEWER LATERALS SHALL NOT EXTEND BEYOND THE INTERIOR WALL OF THE SANITARY SEWER MAIN.

**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

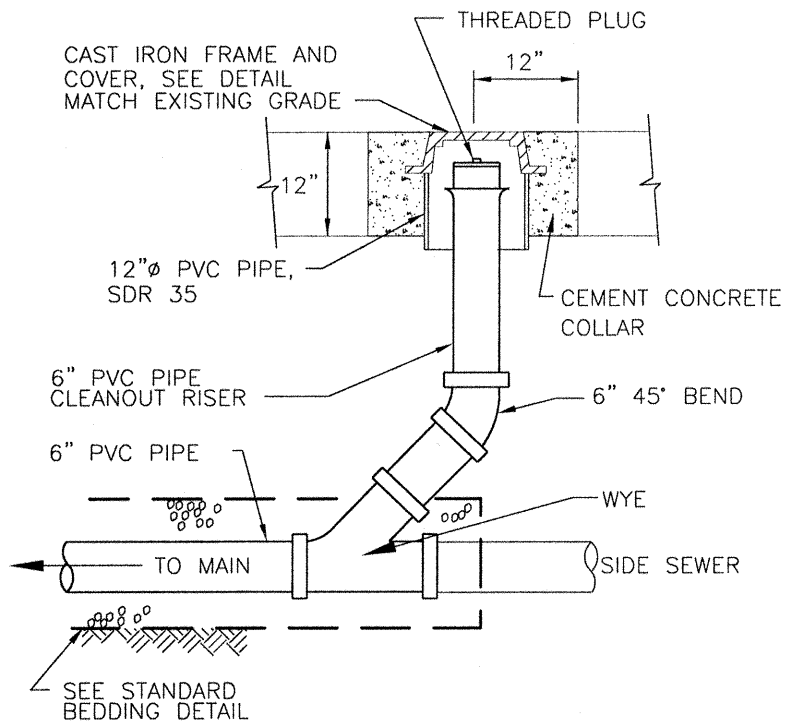
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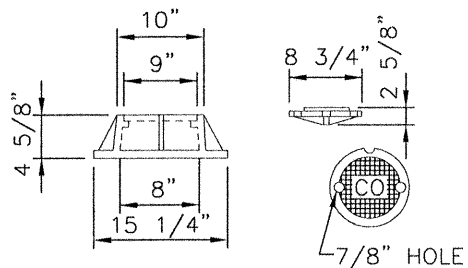
DATE 2/4/03

**LATERAL
SEWER CONNECTION TO
SANITARY SEWER MAIN**

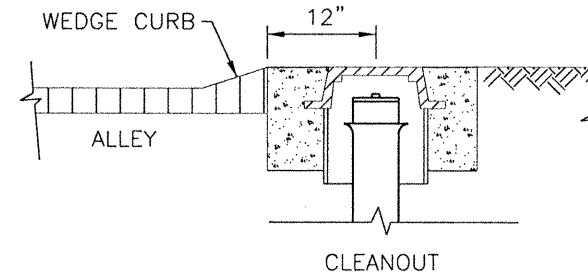
STANDARD PLAN NO. SU-23



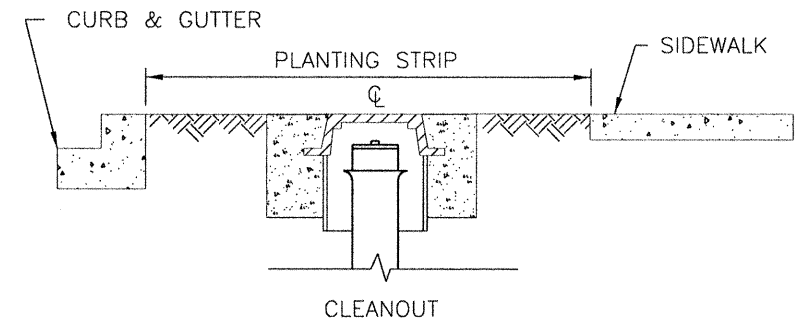
CLEANOUT DETAIL
NOT TO SCALE



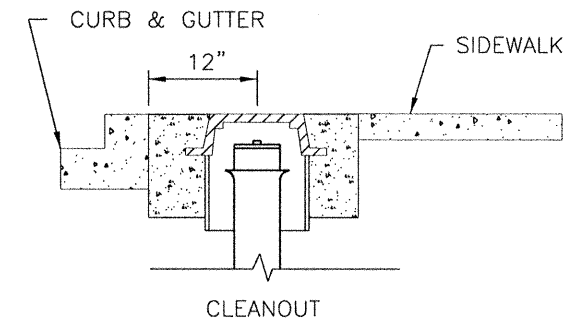
FRAME AND COVER DETAIL
NOT TO SCALE



TYPICAL ALLEY SECTION



TYPICAL SIDEWALK SECTION



TYPICAL COMBINATION SIDEWALK SECTION

STANDARD CLEANOUT LOCATION
NOT TO SCALE

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

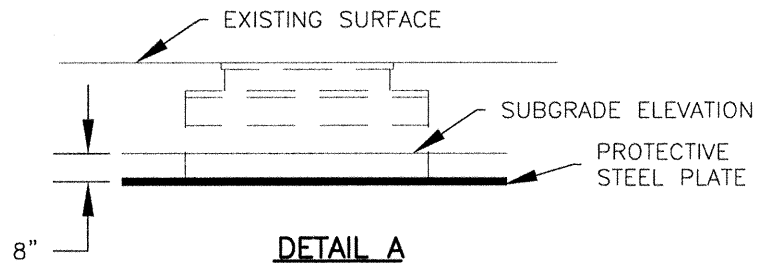
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DATE 2/4/03

SIDE SEWER CLEANOUT
AND
COVER DETAIL
STANDARD PLAN NO. SU-24

PROGRESSION OF WORK



PRIOR TO EXCAVATING OR RESURFACING:

CONTRACTOR SHALL:

REMOVE FRAME AND RISERS TO A DEPTH 8-INCHES BELOW SUBGRADE.
INSTALL STEEL PROTECTIVE PLATE IN ACCORDANCE WITH DETAIL A.
REFERENCE THE LOCATION OF THE UTILITY STRUCTURE.

CONSTRUCTION OF SURFACING:

GRAVEL SURFACING:

INSTALL BASE MATERIALS AND GRAVEL OVER PROTECTIVE STEEL PLATE.

ASPHALT SURFACING:

INSTALL BASE MATERIALS AND ASPHALT OVER PROTECTIVE STEEL PLATE.

CONCRETE SURFACING:

ADJUST FRAME AND GRATE TO FINAL GRADE PRIOR TO PLACING CONCRETE SURFACING.

UPON COMPLETION OF SURFACING:

THE ASPHALT CONCRETE PAVEMENT OR GRAVEL SURFACING SHALL BE REMOVED IN A NEAT CIRCLE IN ACCORDANCE WITH DETAIL B.

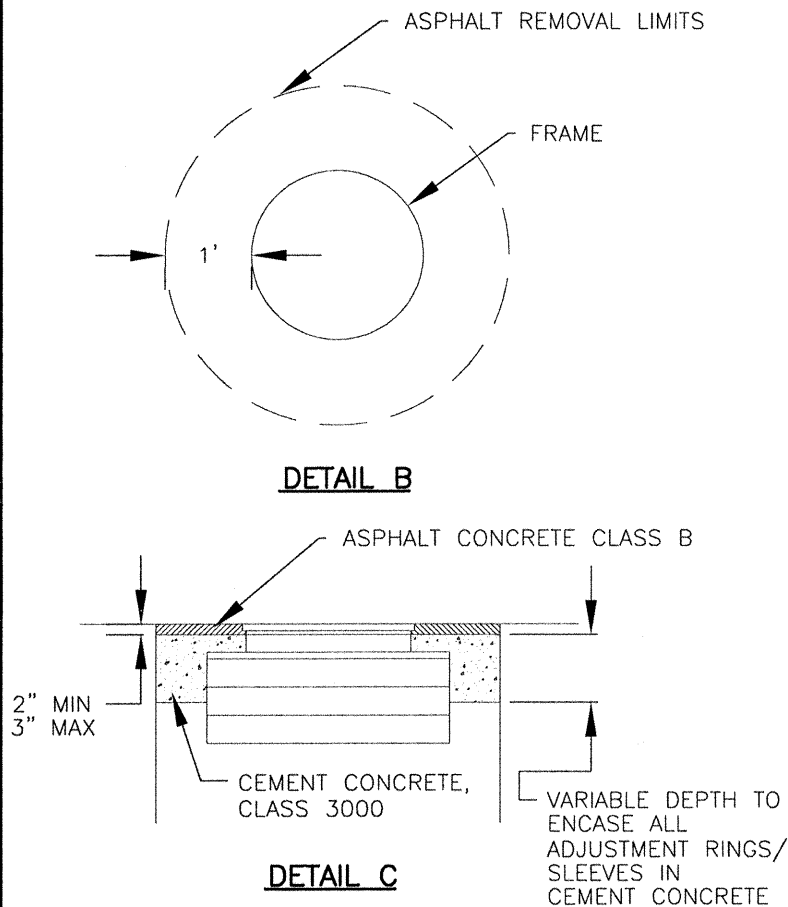
THE LOCATION OF THE ASPHALT OR GRAVEL REMOVAL SHALL BE BASED UPON THE REFERENCE LOCATION ESTABLISHED BY THE CONTRACTOR.

CRUSHED SURFACING AND BASE MATERIALS SHALL BE REMOVED AND DISPOSED OF TO ALLOW THE REMOVAL OF THE STEEL PROTECTIVE PLATE.

THE STRUCTURE SHALL BE ADJUSTED TO FINISH GRADE UTILIZING THE SAME METHODS OF CONSTRUCTION AS SPECIFIED FOR NEW CONSTRUCTION IN SECTION 7-05.

FOR ASPHALT CONCRETE PAVEMENT, THE AREA SHALL THEN BE BACKFILLED WITH CLASS 3000 CEMENT CONCRETE TO AN ELEVATION OF 2 TO 3 INCHES BELOW THE FINISHED PAVEMENT SURFACE. 24-HOURS AFTER PLACING THE CONCRETE, ASPHALT CONCRETE PAVEMENT CLASS B SHALL BE PLACED IN ACCORDANCE WITH STANDARD PLAN NO. 29

FOR GRAVEL SURFACES, THE AREA SHALL THEN BE BACKFILLED WITH CRUSHED SURFACING TOP COURSE AND COMPACTED.



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CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

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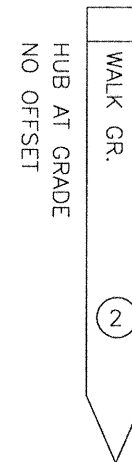
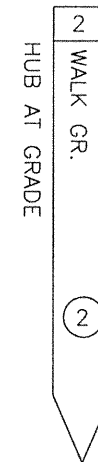
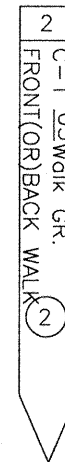
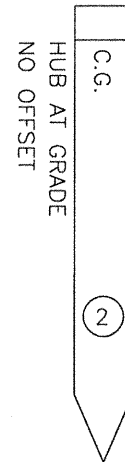
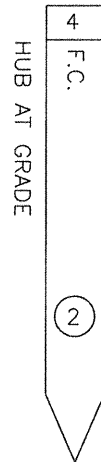
UTILITY
ADJUSTMENT

STANDARD PLAN NO.

SU-25

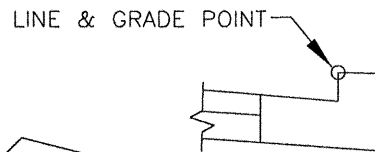
ABBREVIATIONS

F.C.....	FACE OF CURB
C.G.....	CURB GRADE
F.L.....	FLOW LINE
F.WALL...	FACE OF WALL
SH.GR....	SHOULDER GRADE
C.B.....	CATCH BASIN
M.H.....	MAN HOLE
L.H.....	LAMP HOLE
S.G.....	SUBGRADE
B.G.....	BALLAST GRADE
CR.R.GR.	CRUSHED ROCK GRADE
P.C.....	POINT OF CURVATURE
P.T.....	POINT OF TANGENCY
V.C.....	VERTICAL CURVE
E.P.....	EDGE OF PAVING

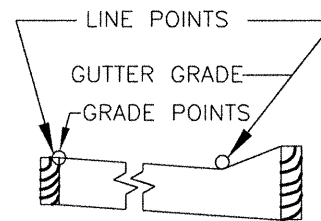


STAKES SHALL HAVE STATIONS ON BACK SIDE.

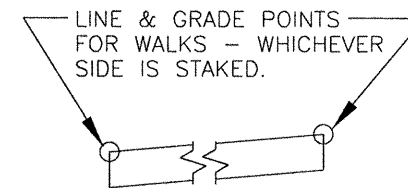
* DESIGNATES DISTANCE FROM GUARD STAKE TO GRADE OR LINE HUB. (OPTIONAL)



CURBS



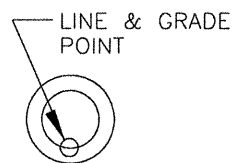
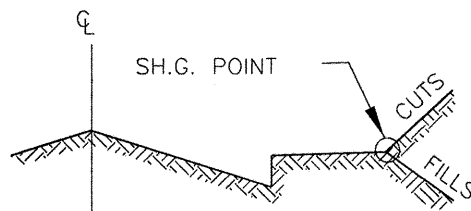
ALLEY SLABS



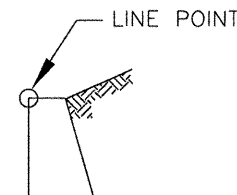
WALKS

SIDE OR BACK

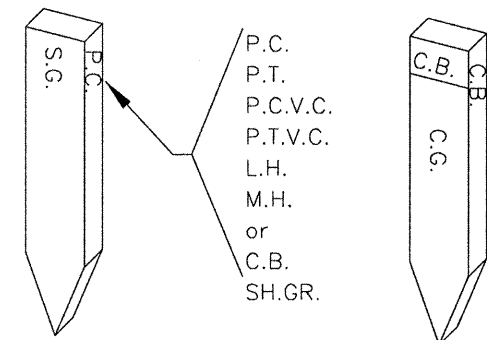
SLOPE STAKES



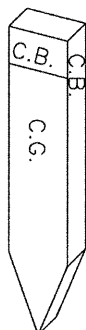
SEWERS



WALLS



P.C.
P.T.
P.C.V.C.
P.T.V.C.
L.H.
M.H.
or
C.B.
SH.GR.



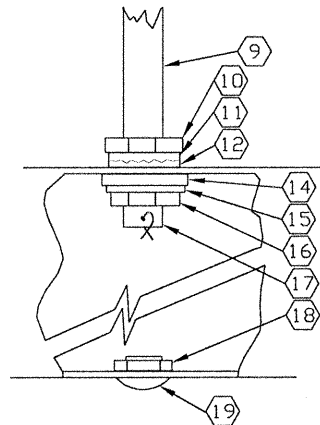
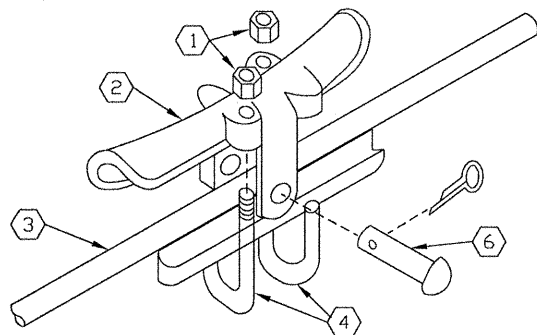
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CITY ENGINEER

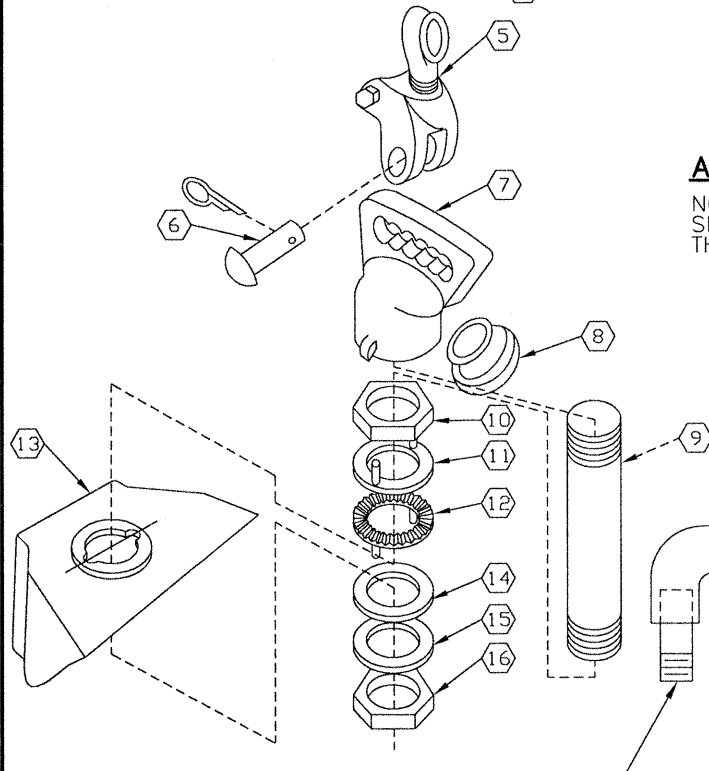
DATE 2/4/03

STANDARD PROCEDURE
FOR MARKING
CONSTRUCTION STAKES
STANDARD PLAN NO. SU-26



ASSEMBLED HEAD DETAIL

NOTE: A FIVE POSITION TERMINAL BLOCK SHALL BE MOUNTED INSIDE AT THE BACK OF THE YELLOW SECTION HOUSING.



MULTIPLE HEAD BRACKET DETAIL

(SHALL INCLUDE LOWER TIE BRACE)

SEE ASSEMBLED HEAD DETAIL (ABOVE)

PLACE AUTOCAULKING DUCT SEAL BETWEEN ALL TOP EXTERIOR COMPRESSION JOINTS.

LEGEND

1. 1/2" STAINLESS STEEL NUT WITH LOCK WASHERS (STAINLESS STEEL OR BRONZE).
2. 9" CABLE SADDLE (BRONZE). PAINTED GREEN, TO FIT 1/4" TO 1/2" SPAN WIRE.
3. SPAN WIRE.
4. 1/2" 'J' CABLE CLAMPS (STAINLESS STEEL).
5. BRONZE BALANCE ADJUSTER DIRECTIONAL LOCK, PAINTED GREEN, WITH STAINLESS STEEL BOLTS AND WASHERS.
6. 5/8" PINS (STAINLESS STEEL) WITH BRASS OR STAINLESS STEEL COTTER PIN. INSTALL BRASS OR STAINLESS STEEL WASHERS ON EACH SIDE OF COTTER PIN.
7. BRONZE ENTRANCE FITTING, PAINTED GREEN.
8. 1-1/2" INSULATED CHASE NIPPLE.
9. 1-1/2" GALVANIZED DROP PIPE PAINTED SILVER. SEE NOTE BELOW. BOTTOM THREADS TO ACCOMMODATE FULL NUT AND LOCKING WIRE.
10. 1-1/2" MALLEABLE LOCK NUT-JAM TIGHT BEFORE INSTALLING HEAD.
11. (NON-CORROSIVE) SERRATED LOCKING WASHER.
12. SERRATED LOCKING WASHER (MAY BE OMITTED IF THE TOP OF THE VEHICLE HEAD IS SERRATED).
13. SIGNAL HEAD WITH AUTOCAULKING IN LOCKING HOLES AT TOP OF THE VEHICLE HEAD.
14. 1-1/2" DIAMETER FLAT CORK GASKET. (NEOPRENE OK)
15. 1-1/2" NON-CORROSIVE SLIP RING.
16. 1-1/2" MALLEABLE NUT.
17. SAFETY LOCKING WIRE, #14TW OR EQUAL.
18. NUT (NO GASKET).
19. PINNACLE (NO WASHER) BOTTOM OF LOWEST SECTION.
20. 1-1/2" GALVANIZED 90° ELBOW, PAINTED GREEN.
21. STAINLESS STEEL SET SCREW WITH HEX HEAD.
22. 1-1/2" GALVANIZED NIPPLE, PAINTED GREEN.
23. TWO-WAY HOUSING WITH BOTTOM COVER, PAINTED GREEN.

NOTE:

ALL METAL THREADS AND BRACKETS SHALL BE PAINTED WITH A HIGH QUALITY RUST PREVENTATIVE PAINT. A COAT OF GALVANIZED BONDING PRIMER SHALL BE APPLIED AND THOROUGHLY DRY BEFORE APPLYING FINISH COAT OF PAINT. ANY PAINTED HARDWARE DAMAGED DURING ASSEMBLY OR SHIPPING SHALL BE PAINTED AGAIN.

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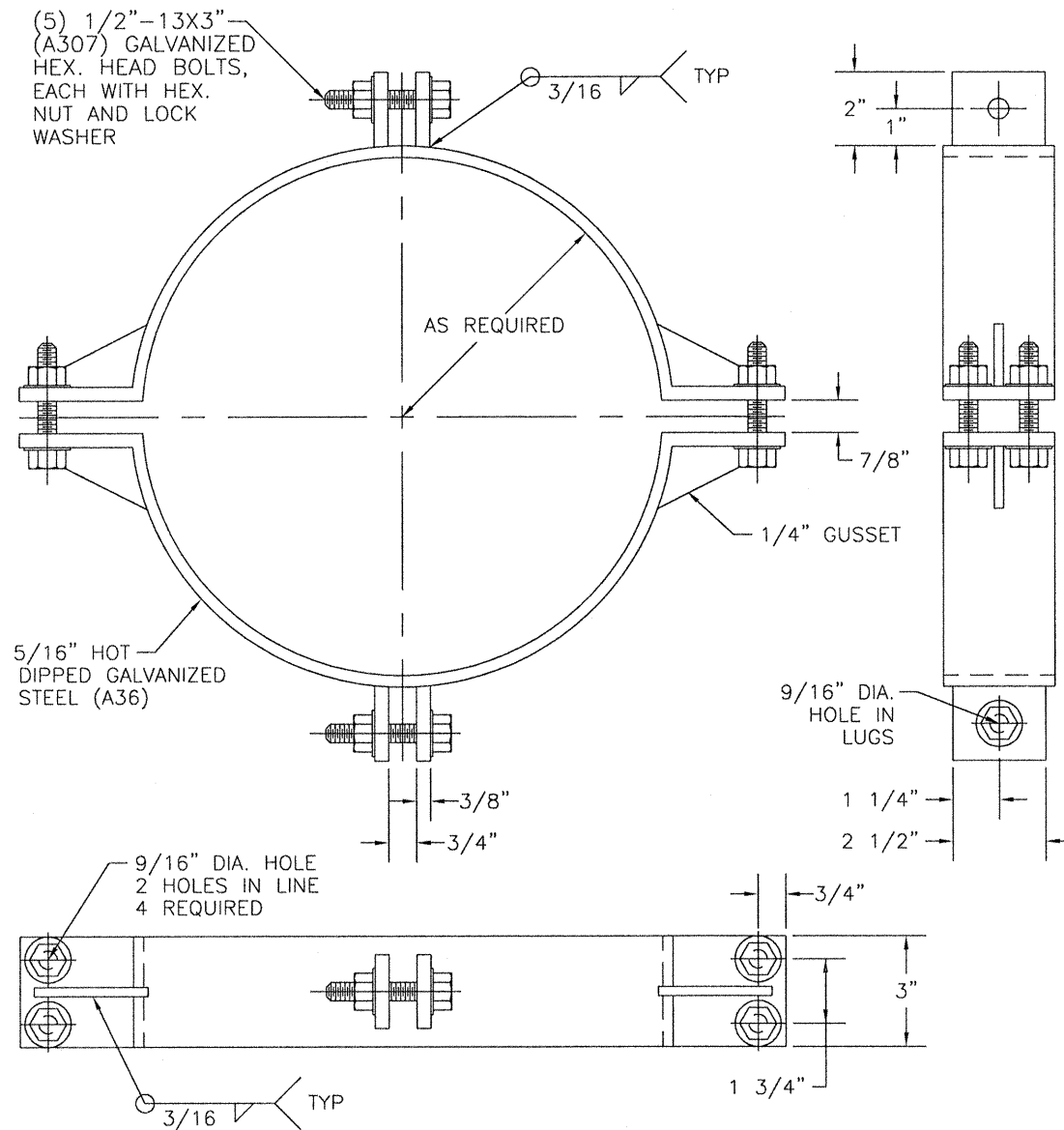
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CITY ENGINEER

DATE 2/4/03

VEHICLE TRAFFIC SIGNAL
(SINGLE & MULTIPLE)
HANGER ASSEMBLY

STANDARD PLAN NO. TS-01



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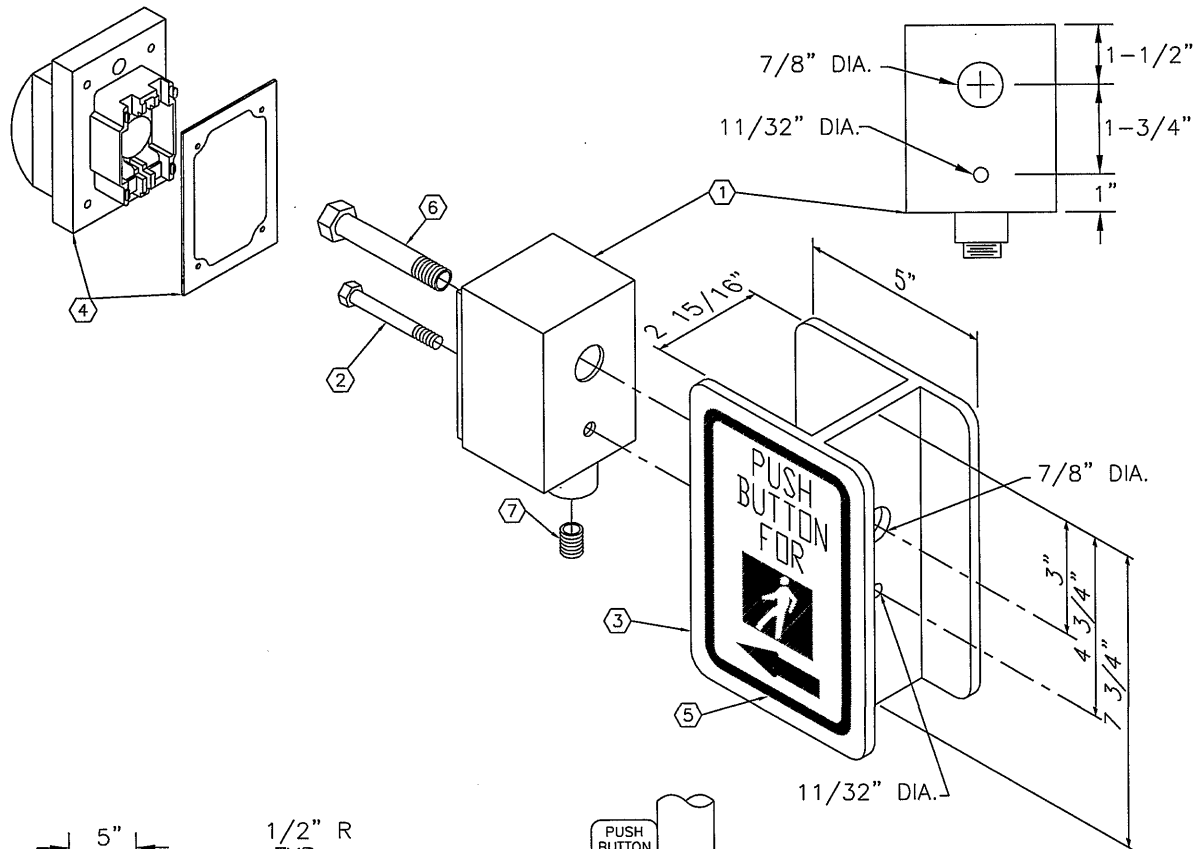
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DATE 2/4/03

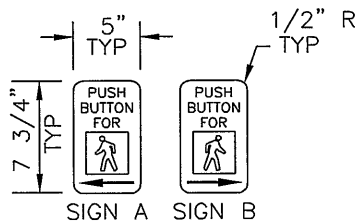
SPAN WIRE
STRAIN CLAMP

STANDARD PLAN NO. TS-02

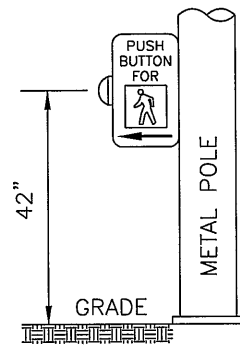


CONSTRUCTION NOTES

- ① FD-1-50-A CAST ALUMINUM BOX
- ② 5/16 INCH STAINLESS HEX BOLT WITH LOCK WASHER. DRILL & TAP POLE FOR 5/16 INCH STAINLESS STEEL BOLT.
- ③ H-TYPE EXTRUDED ALUMINUM OR FABRICATED APPROVED EQUAL
- ④ BUTTON, PLATE, STAINLESS STEEL FASTENERS & GASKET. PUSHBUTTON MECHANISM MUST HAVE MINIMUM OF 1/8 INCH OVER TRAVEL. REES #1371-412 OR APPROVED EQUAL.
- ⑤ SIGN TO BE SCREENED ON BOTH FACES OF EXTRUDED ALUMINUM OR ON SEPARATE PANELS
- ⑥ 1/2 INCH CHASE NIPPLE W/NPT
- ⑦ 1/2 INCH ALUMINUM PLUG (DRILL 1/8 INCH DRAIN HOLE)



SIGN DETAILS



TYPICAL INSTALLATION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

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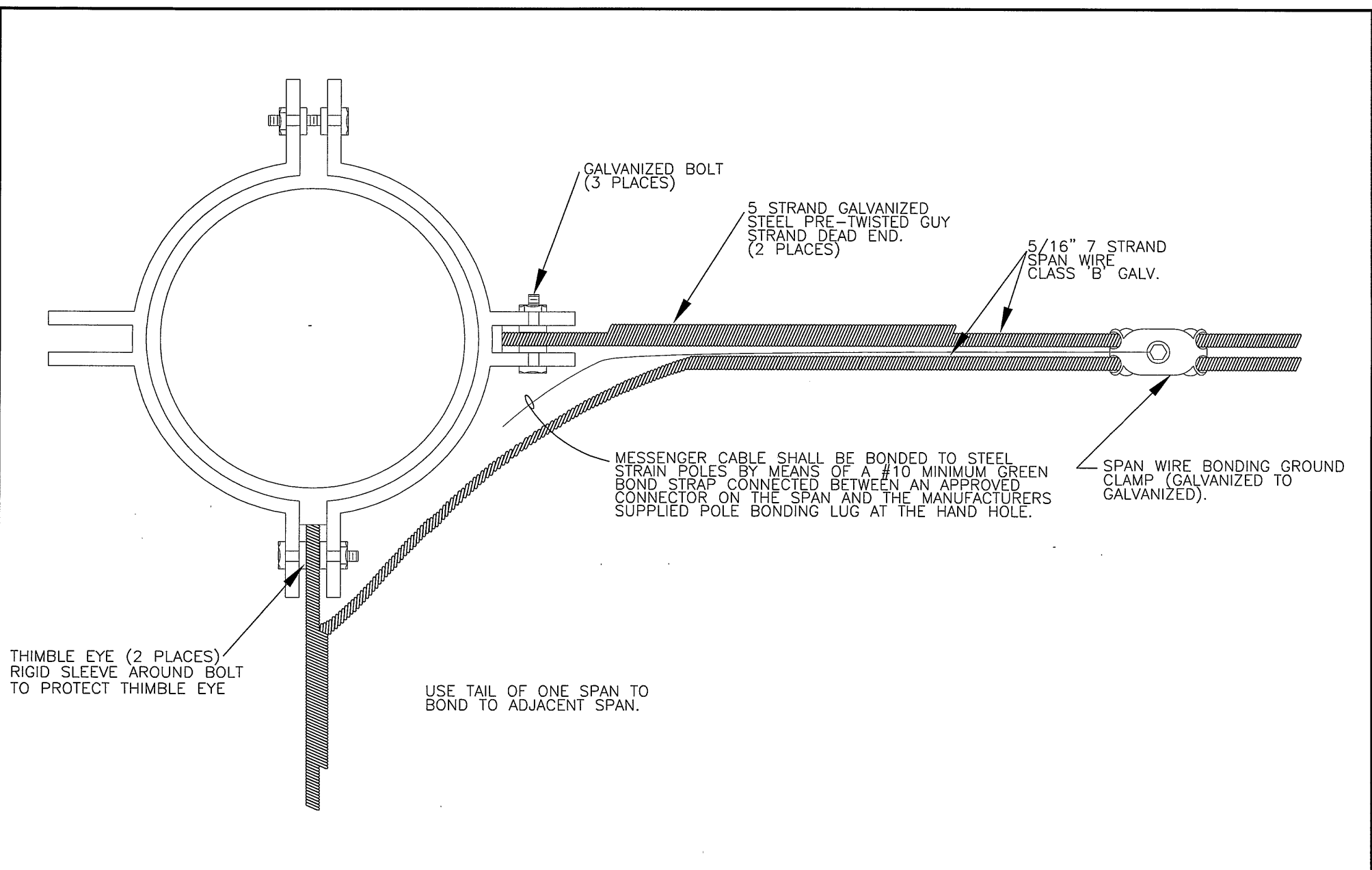
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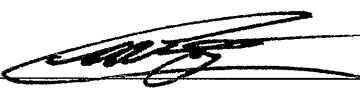
DATE 2/4/03

H-TYPE PEDESTRIAN
PUSHBUTTON
ASSEMBLY

STANDARD PLAN NO. TS-03



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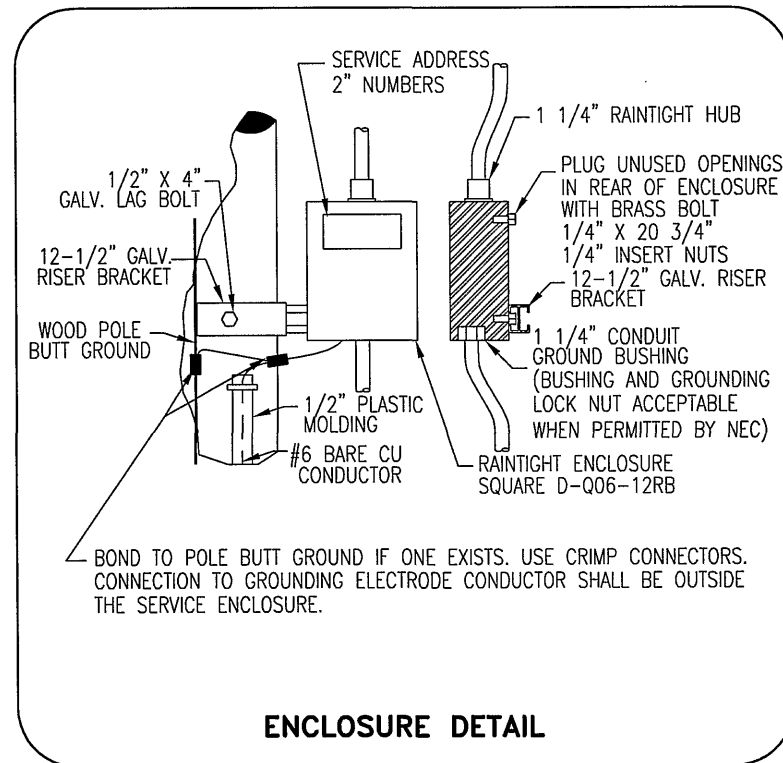
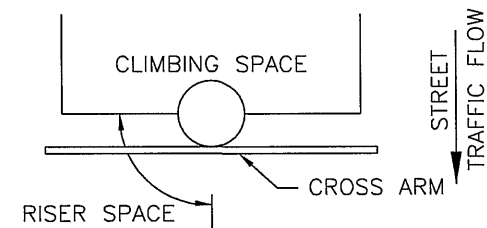
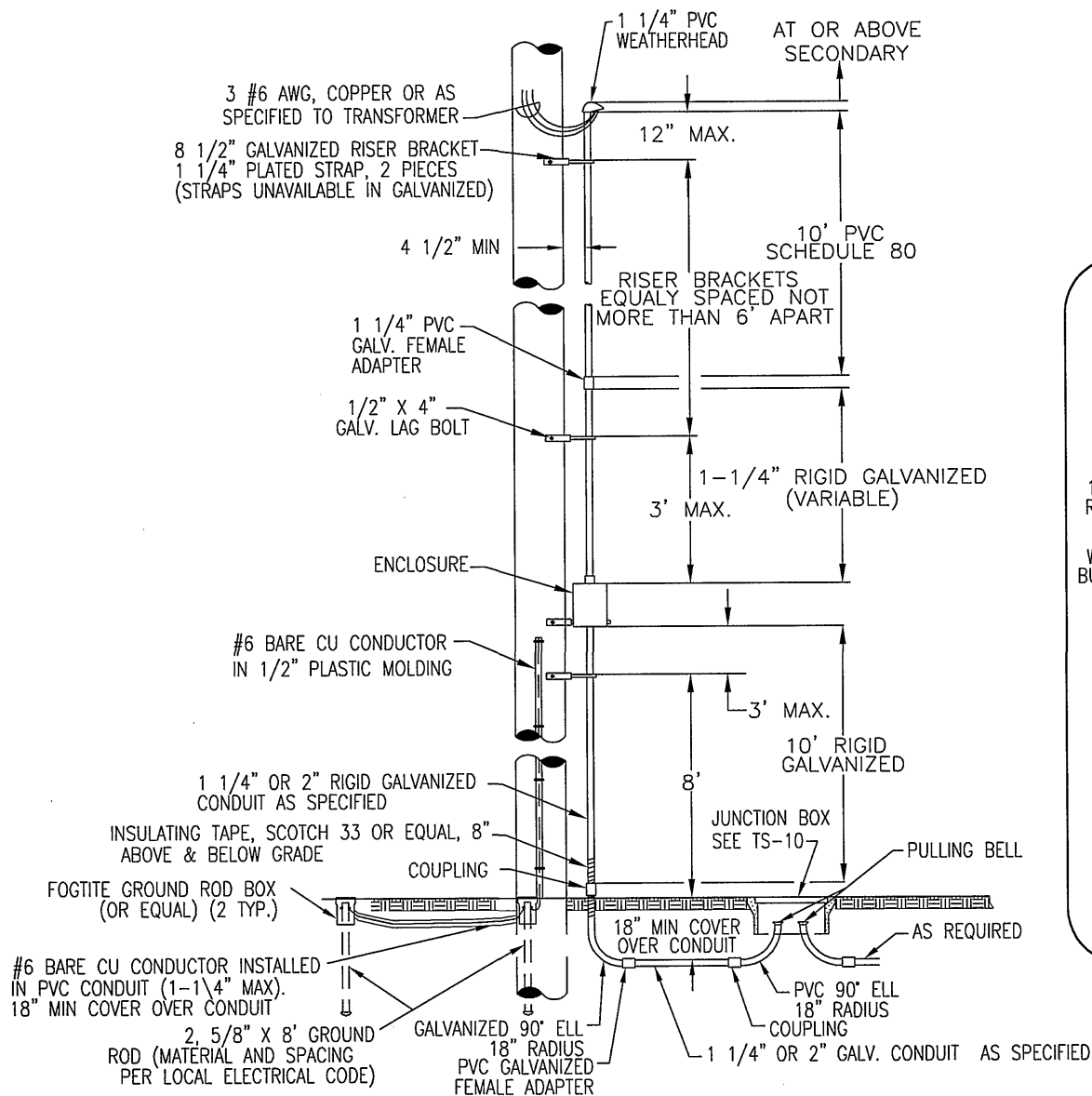
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CITY ENGINEER DATE 2/4/03

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

SPAN WIRE
DETAIL

STANDARD PLAN NO. TS-04



NOTE: OFFSET BEND IN CONDUIT SO STANDOFF BRACKETS MAINTAIN VERTICAL ALIGNMENT.

SUITABLE FOR CONNECTION TO UTILITY TRANSFORMERS NOT GREATER THAN 50 KVA. LARGER TRANSFORMERS WILL REQUIRE ANALYSIS OF INTERRUPT CAPACITY OF SERVICE EQUIPMENT.

**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

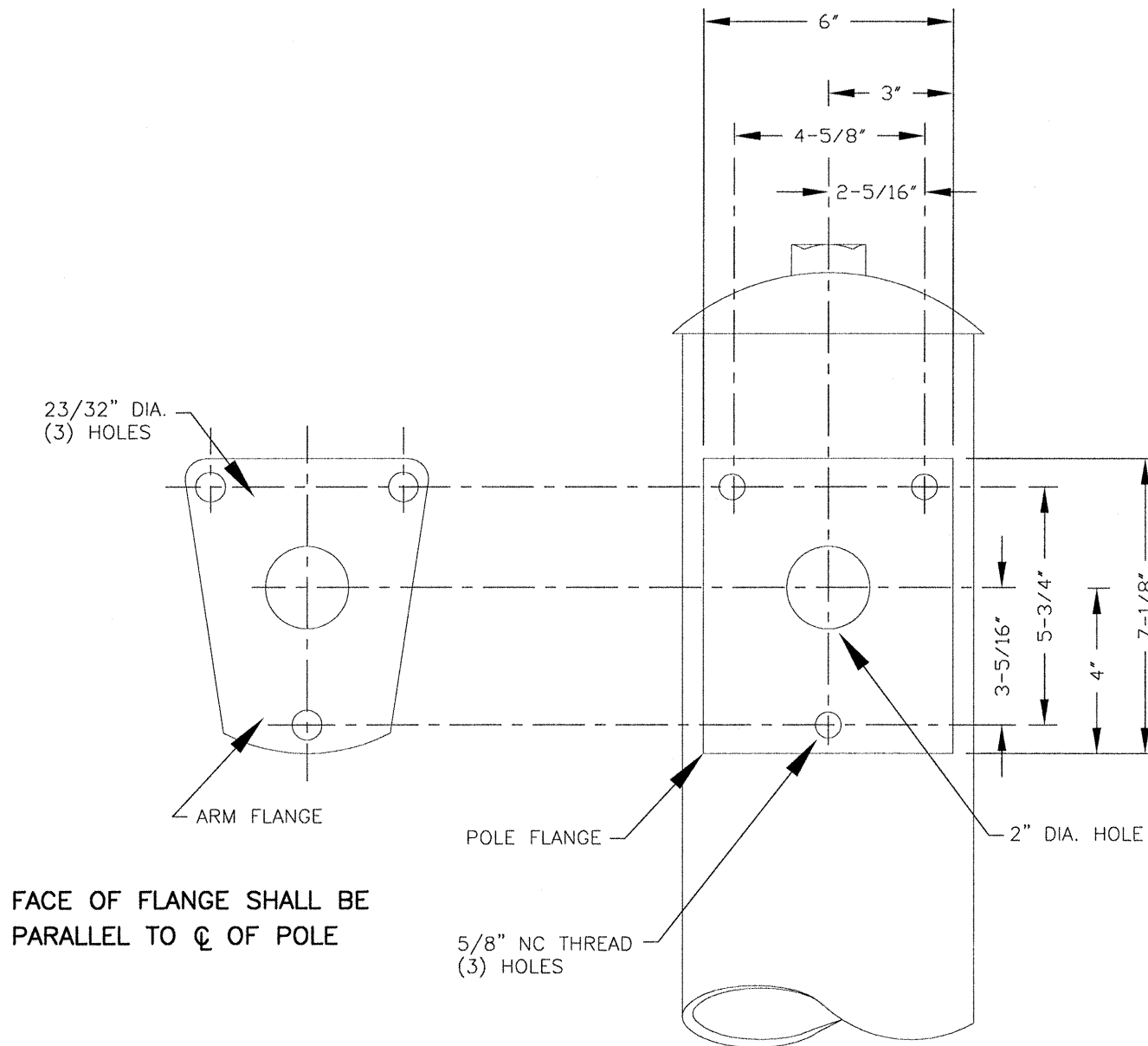
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CITY ENGINEER

DATE 2/4/03

**RISER ASSEMBLY
UNDERGROUND
SERVICE CONDUIT**

STANDARD PLAN NO. TS-05



FACE OF FLANGE SHALL BE
PARALLEL TO ϕ OF POLE

5/8" NC THREAD
(3) HOLES

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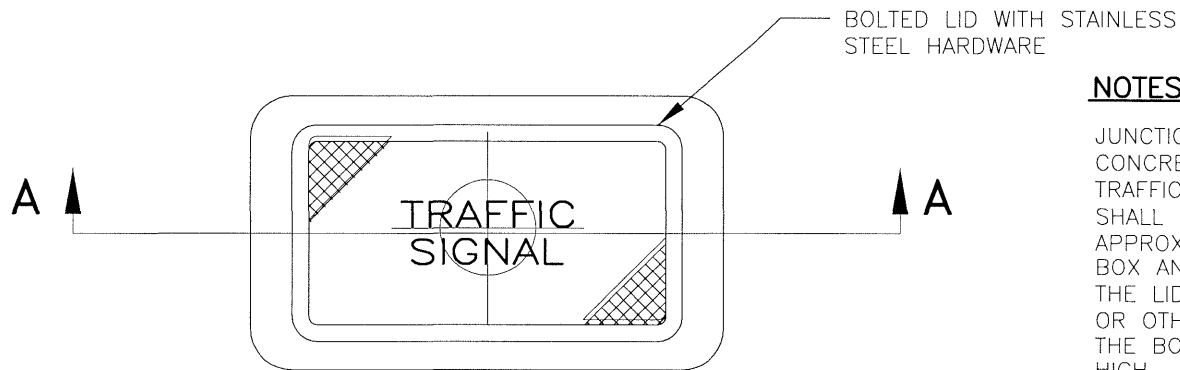
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

DATE 2/4/03

STREETLIGHT
MAST ARM MOUNTING
FLANGE DETAIL

STANDARD PLAN NO. TS-07



NOTES:

JUNCTION BOXES SHALL BE CONCRETE WITH LOCKING POLYMER CONCRETE OR CAST-IRON LIDS. LIDS SHALL BE RATED FOR TRAFFIC AND SHALL HAVE A NONSKID SURFACE. THE LIDS SHALL HAVE AN EDGE THICKNESS OF 1-3/4" AND BE APPROXIMATELY 10-1/8" x 15-1/4" FOR A STANDARD JUNCTION BOX AND 13-1/8" x 22-1/8" FOR A LARGE JUNCTION BOX. THE LID SHALL BE MARKED "TRAFFIC SIGNAL", "STREETLIGHTING", OR OTHER DESIGNATION AS CALLED FOR ON THE PROPOSAL. THE BODY OF THE BOX SHALL BE A MINIMUM OF 12 INCHES HIGH.

EITHER METHOD SHOWN IS ACCEPTABLE FOR PLASTIC OR METAL CONDUIT. IF PIPE BENDER IS NOT AVAILABLE USE COUPLING AND STANDARD 90° BEND. BOX SHALL SET ON A 6 INCH CRUSHED SURFACING TOP COURSE FOR DRAINAGE.

CARE SHALL BE TAKEN TO PLACE JUNCTION BOXES OUT OF AREAS HEAVILY USED BY PEDESTRIANS, ESPECIALLY NEAR CROSSWALKS AND CORNERS.

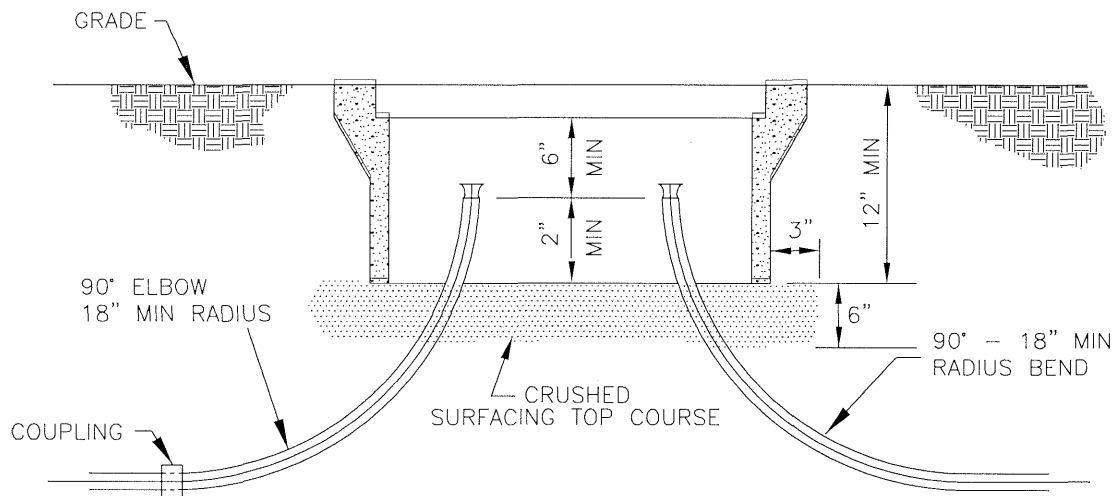
METAL COVERS SHALL BE GROUNDED. GROUND CONNECTION SHALL BE MINIMUM 24" LONG.

JUNCTION BOXES SHALL NOT BE PLACED IN CURB RAMPS OR AREAS SUBJECT TO VEHICULAR TRAFFIC.

ADJACENT JUNCTION BOXES SHALL BE SEPARATED BY A MINIMUM OF THREE (3) INCHES.

CONDUIT SHALL BE PLACED WITHIN 3" OF THE BOX WALL NEAREST ITS ENTRY LOCATION. INSTALL PULLING BELLS OR BUSHINGS ON CONDUIT ENDS.

JUNCTION BOXES SHALL BE RATED FOR 8000 POUND LOAD ON COVER.



CONDUIT METHOD I

CONDUIT METHOD II

SECTION A-A

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DEPARTMENT OF PUBLIC WORKS

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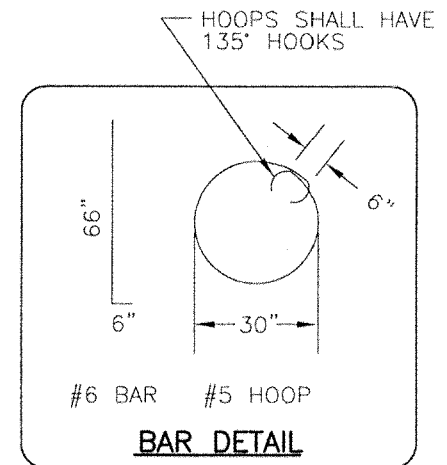
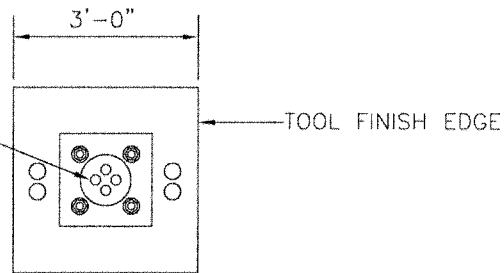

CITY ENGINEER


DATE

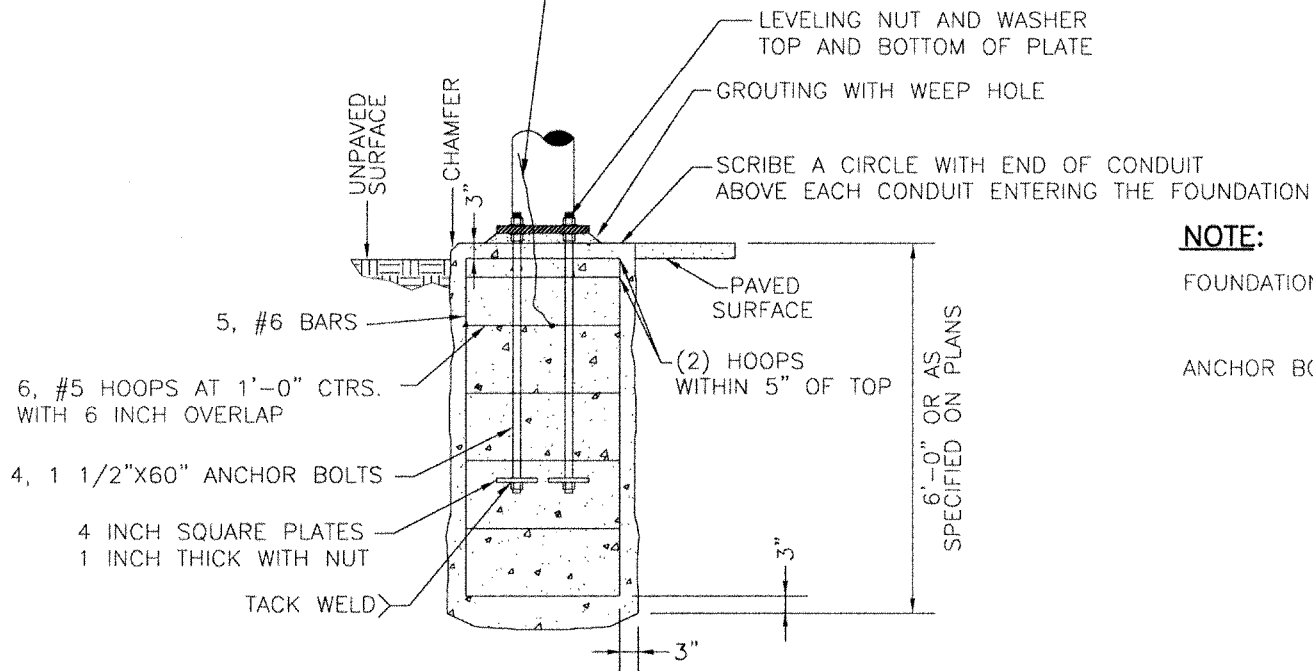
JUNCTION BOX
INSTALLATION
TYPICAL

STANDARD PLAN NO. TS-08

CONDUIT SHALL BE CENTERED
IN 8 INCH DIAMETER CIRCLE
WITH SPACING FOR COUPLINGS.
CONDUIT SHALL BE STRAIGHT
AND VERTICAL IN POLE.
THERE SHALL BE A MINIMUM
OF 4 CONDUITS IN EACH
FOUNDATION.



#6 STRANDED GROUND CABLE.
BOND CAGE TO GROUND LUG.



NOTE:

FOUNDATION

TOP ELEVATION SET BY ENGINEER.
TOP 6 INCHES SHALL BE FORMED SQUARE.

ANCHOR BOLTS

SPACING AS PER TEMPLATE SUPPLIED
BY POLE SUPPLIER.
TOP OF BOLTS TO BE LEVEL.
SEE SECTION 9-29.14 OF THE CITY
AMENDMENTS.
ANCHOR BOLTS SHALL EXTEND 6.0 TO 6.5
INCHES ABOVE THE FOUNDATION UNLESS
OTHERWISE SPECIFIED.

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DEPARTMENT OF PUBLIC WORKS

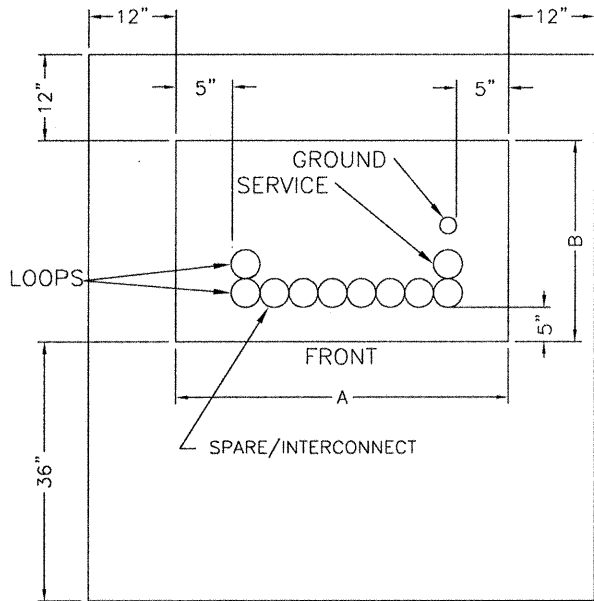
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CITY ENGINEER

DATE 2/4/03

STRAIN POLE
STANDARD
FOUNDATION

STANDARD PLAN NO. TS-09



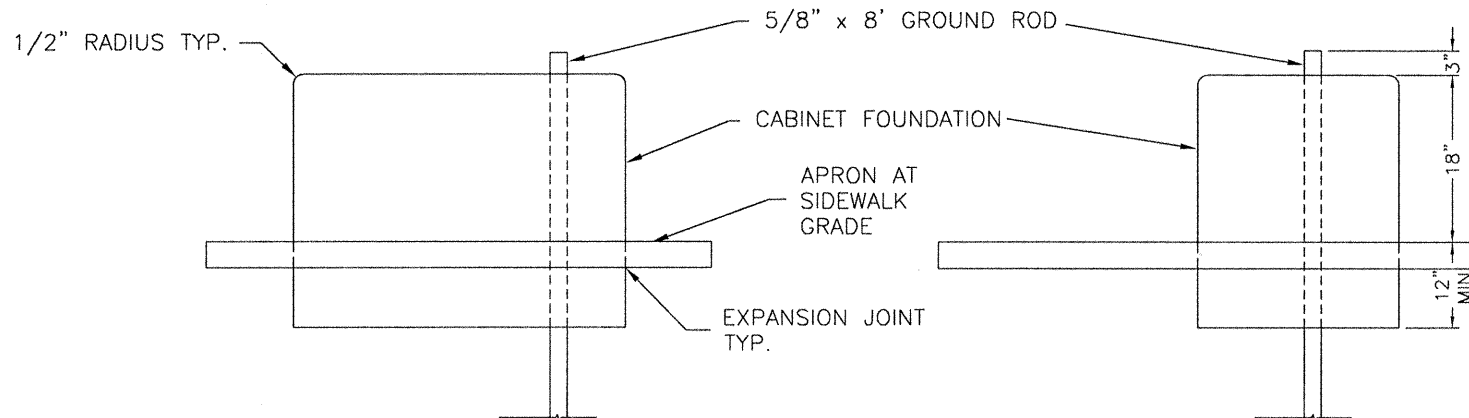
PLAN VIEW

M-CABINET FOUNDATION
A=32", B=19"

P-CABINET FOUNDATION
A=46", B=28"

NOTES:

1. CONDUIT SHALL HAVE MINIMUM 18" RADIUS BENDS.
2. CONDUITS SHALL EXTEND 1" ABOVE TOP OF BASE. INSTALL PULLING BELLS ON CONDUIT ENDS.
3. CONDUITS TO BE INSTALLED PER ENGINEER'S INSTRUCTIONS.
4. CABINET ANCHORS SHALL BE EXPANSION ANCHORS (5/8" x 4-1/2").
5. 4" THICK CONCRETE APRON SHALL EXTEND 12" AROUND REAR AND SIDES AND 36" IN FRONT. INSTALL EXPANSION JOINT BETWEEN FOUNDATION AND APRON.



FRONT VIEW

SIDE VIEW

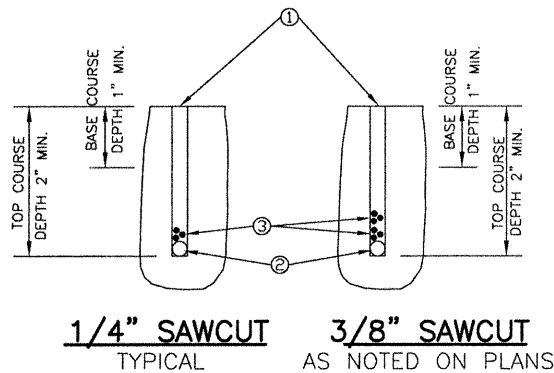
CITY OF TACOMA
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CITY ENGINEER

DATE 2/4/03

FOUNDATION & APRON FOR
"M" AND "P"
CONTROLLER CABINETS
STANDARD PLAN NO. TS-10

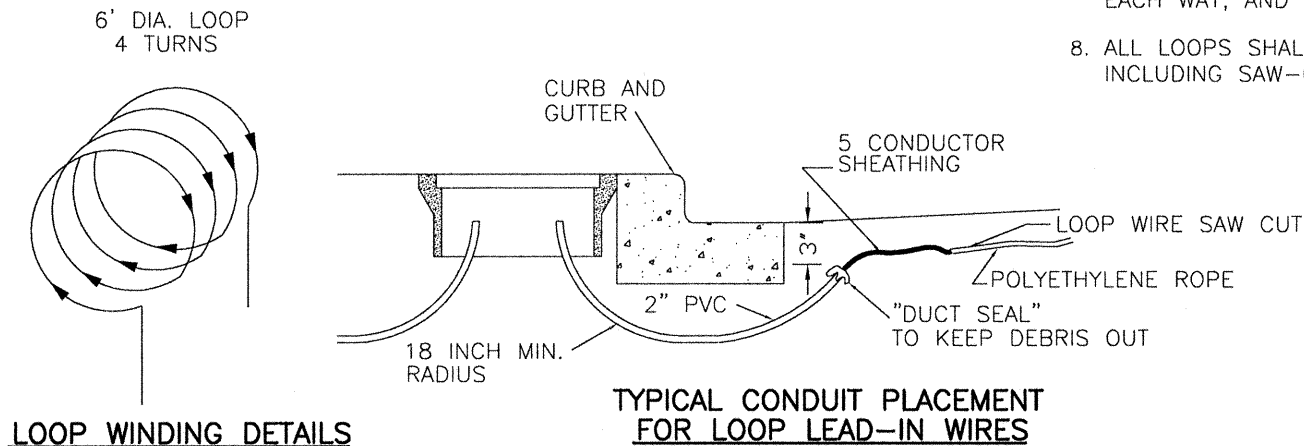


NOTES:

- ① SEALANT – CRAFTCO 34271 OR EQUAL TO WITHIN 1/4 INCH OF THE SAWCUT. DO NOT OVERFILL.
- ② TWISTED POLYETHYLENE ROPE (SIZE FOR SNUG FIT).
- ③ LOOP WIRE (SEE LOOP WINDING DETAIL) OR LEAD – IN WIRES: ONE PAIR FOR EACH LOOP SERVED, 2 PAIRS MAX. PER SAWCUT.

CONSTRUCTION NOTES:

1. CHANGE FROM 2 INCH CUT TO APPROXIMATELY A 4 INCH CUT AT ABOUT 12 INCHES FROM CURB.
2. LEAD-IN CUT SHALL BE THE SAME AS LOOP CUT EXCEPT AS INDICATED ON THE PLANS. IN THE LAST 12 TO 18 INCHES FROM THE GUTTER SECTION THE CUT SHALL GRADUALLY TRANSITION TO A FULL DEPTH CUT WHERE THE CONDUIT STUBS OUT UNDER THE CURB AND GUTTER. THIS WILL ALLOW THE LEAD-IN WIRE TO EXIT THE CONDUIT AND ENTER THE SAW CUT WITH NO SHARP EDGES.
3. METHOD SAME FOR CONCRETE OR ASPHALT PAVEMENTS.
4. INSTALL 5 CONDUCTOR CABLE SHEATHING OVER INDIVIDUAL PAIRS. EXTEND 6 INCHES INTO SAWCUTS AND 6 INCHES INTO CONDUIT. LEAVE SLACK AS DIRECTED BY ENGINEER.
5. ALL SAWCUTS SHALL BE CLEANED WITH A HIGH PRESSURE WASHER AND DRIED WITH 100 PSI MINIMUM AIR PRESSURE. ALL WASH WATER AND SLURRY SHALL BE VACCUMED UP AND PROHIBITED FROM LEAVING THE IMMEDIATE CUT AREA.
6. ONLY THOSE LOOPS THAT CAN BE COMPLETELY FINISHED, HAVING LOOP WIRE, ROPE AND SEALANT INSTALLED, IN ONE WORKING DAY, SHALL BE SAW-CUT IN THAT WORKING DAY. NO CONTINUOUS TRAFFIC SHALL BE ALLOWED TO TRAVEL OVER OPEN SAW-CUTS BEFORE LOOP WIRE, ROPE AND SEALANT HAVE BEEN INSTALLED. ALL ROADWAY SURFACES SHALL BE THOROUGHLY CLEANED UPON COMPLETION OF ANY LOOP WORK.
7. LOOP SPLICING PROCEDURE SHALL BE TO TWIST THE WIRE, SOLDER IT, WRAP WITH ELECTRICIAN'S TAPE TO 4 INCHES PAST THE SPlice EACH WAY, AND COAT WITH MOISTURE-RESISTANT VARNISH.
8. ALL LOOPS SHALL BE COMPLETELY INSTALLED BY THE CONTRACTOR INCLUDING SAW-CUTTING, LAYING WIRE, TESTING AND SEALANT.



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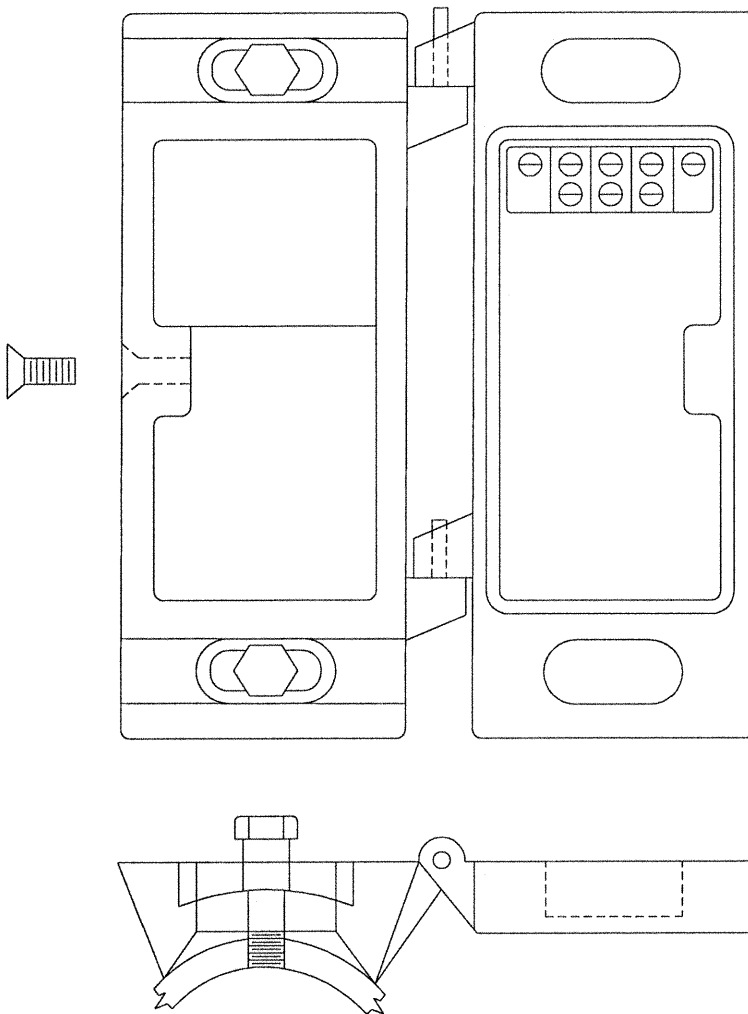
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INDUCTION LOOP
DETAILS

STANDARD PLAN NO. TS-11

POLE HALF

SIGNAL HALF



MATERIAL:

CAST ALUMINUM ALLOY

STANDARD PAINT FINISHES:

DARK OLIVE GREEN

DIMENSIONS:

11-1/4" H MAXIMUM x5-1/2" W MAXIMUM x2-3/4 D MAXIMUM

WEIGHT:

TOTAL WEIGHT SHALL NOT EXCEED 7-1/2 LBS.

CONSTRUCTION:

THE CLAMSHELL CONSISTS OF A TWO PART MOUNTING ASSEMBLY. THE HINGE PINS ON THE POLE MOUNTED HALF SHALL BE STAINLESS STEEL AND FIT INTO THE EARS ON THE SIGNAL MOUNTED HALF.

MOUNTING:

THE POLE HALF OF THE ASSEMBLY SHALL BE DESIGNED TO FIT THE CURVATURE OF POLES 4" IN DIAMETER AND LARGER.

THE CLAMSHELL SHALL BE MECHANICALLY DESIGNED TO ALLOW FOR VARIOUS TYPES OF MOUNTING SUCH AS BANDING, THRU-BOLT OR LAG SCREW MOUNTING. THE BOLT HOLES SHALL BE ELONGATED HORIZONTALLY TO ALLOW FOR ROTATION ON THE POLE.

THE SIGNAL HALF OF THE ASSEMBLY SHALL BE SECURED TO THE POLE HALF THROUGH USE OF A FLATHEAD SOCKET BOLT AND TIGHTENED USING A 3/16" ALLEN WRENCH.

THE POLE HALF SHALL BE MOUNTED TO THE STRAIN POLE USING BOLTS EXCEPT AS DIRECTED BY THE ENGINEER.

THE BOTTOM OF THE PEDESTRIAN SIGNAL HEAD SHALL BE 8' ABOVE THE FINISHED SIDEWALK GRADE.

WIRING:

THE FIELD WIRING SHALL BE TERMINATED ON A HORIZONTALLY MOUNTED 3 POSITION TERMINAL BLOCK LOCATED IN THE UPPER HALF OF THE SIGNAL HALF.

MISCELLANEOUS:

A NEOPRENE GASKET WILL PROVIDE A RAIN-TIGHT SEAL

DRILL AND TAP HOLE IN STEEL POLE FOR 3/4" INSULATED CHASE NIPPLE FOR WIRING.

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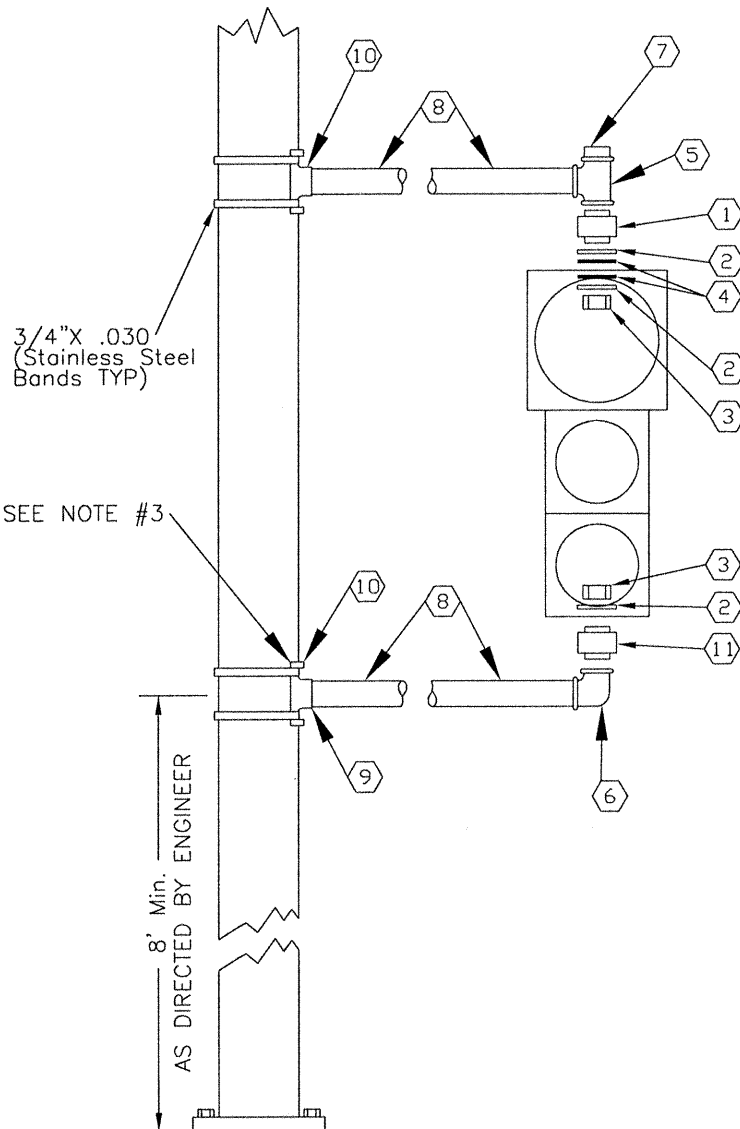
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PEDESTRIAN SIGNAL
CLAMSHELL POLE
MOUNTING DETAIL

STANDARD PLAN NO. TS-12



STEEL POLE

NOTES:

1. ALL METAL THREADS SHALL BE PAINTED WITH A HIGH QUALITY RUST PREVENTATIVE PAINT AND DRIED BEFORE ASSEMBLY. AFTER ASSEMBLY, A COAT OF GALVANIZED BONDING PRIMER PAINT SHALL BE APPLIED (AND THOROUGHLY DRY BEFORE PAINTING). COMPLETE BRACKET ASSEMBLY SHALL HAVE A FINISH COAT OF EXTERIOR QUALITY GREEN PAINT. ANY PAINTED HARDWARE DAMAGED DURING ASSEMBLY OR SHIPPING SHALL BE PAINTED AGAIN.
2. ALL TEES AND ELBOWS SHALL BE MADE FLAT AND LEVEL AT CONTACT POINTS, FOR WATERTIGHT SEAL.
3. THE BOTTOM BRACKET FLANGE ON A STEEL POLE SHALL HAVE A 5/16" X 3/4" FLATHEAD BRASS OR BRONZE SCREW LOCATED IN THE TOP OF THE FLANGE. THE SCREW SHALL BE TAPPED INTO THE CENTERLINE OF THE POLE BEFORE BANDING.

LEGEND:

1. 1-1/2" GALVANIZED NIPPLE TO PROVIDE FULL NUT, (REAMED AND PRIMED) WITH 1" LONG PIECE OF PVC CONDUIT USED AS SPACER.
2. 1-1/2" DIAMETER NON-CORROSIVE SLIP RING.
3. 1-1/2" MALLEABLE NUT, NON-CORROSIVE.
4. 1-1/2" DIAMETER FLAT CORK GASKET. (NEOPRENE OK)
5. 1-1/2" GALVANIZED TEE.
6. 1-1/2" GALVANIZED ELBOW.
7. GALVANIZED PIPE PLUG.
8. FOR STEEL OR WOOD POLES 1-1/2" GALVANIZED NIPPLE 12" LONG.
9. FOR CONCRETE POLES, SEE CONCRETE POLE MOUNTING DETAIL.
10. DRILL AND TAP HOLE IN STEEL POLE FOR 3/4" INSULATED CHASE NIPPLE FOR WIRING.
11. ALUMINUM POLE FLANGE. SEE NOTE #3.

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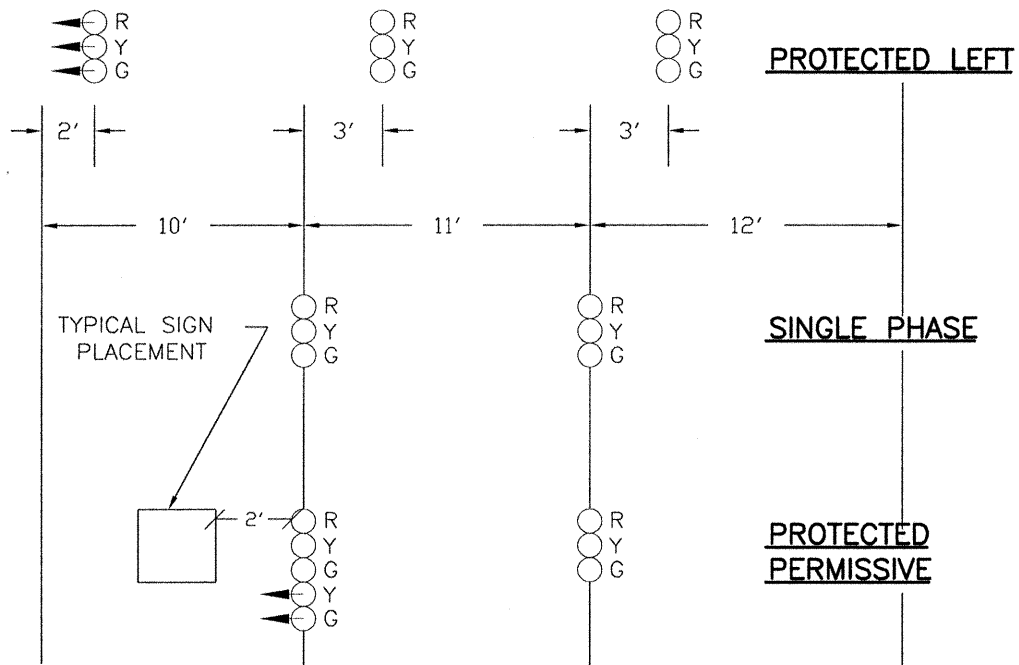
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DATE 2/4/03

**VEHICLE SIGNAL HEAD
POLE MOUNT
DETAIL**

STANDARD PLAN NO. TS-13

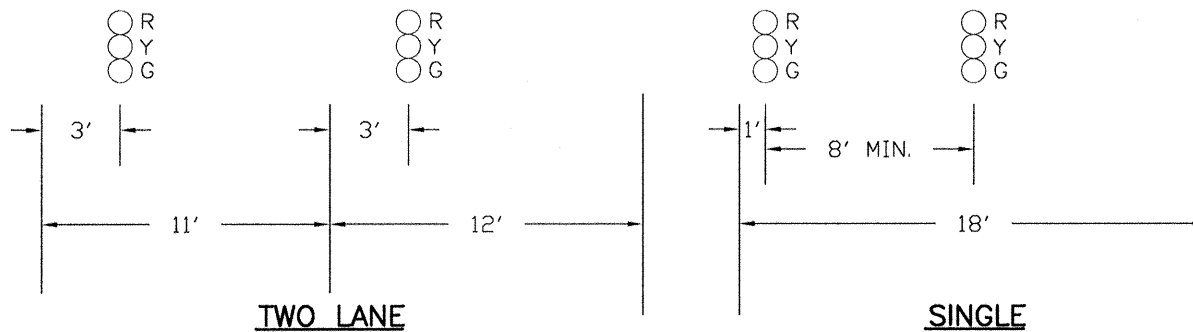


NOTE:

THIS STANDARD DEPICTS A VEHICLE HEAD PLACEMENT AS IT RELATES TO THE LANE LINES ON THE APPROACH TO THE GIVEN HEADS.

SIGNAL HEADS MUST BE LEVELED TO SPEC FROM A POINT 80 FEET FROM THE STOP BAR.

OVERHEAD SIGNS SHALL BE PLACED 2 FEET FROM VEHICLE HEAD.



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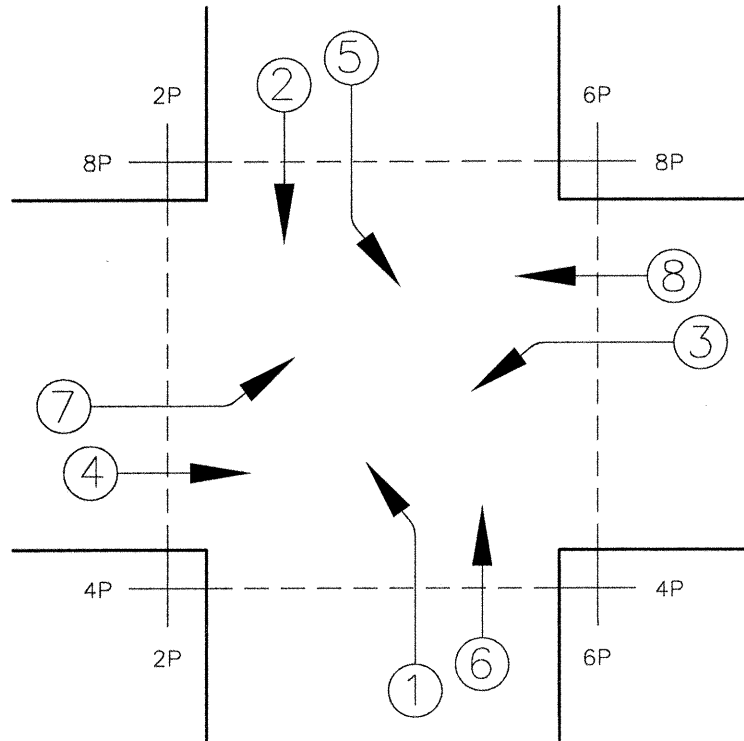
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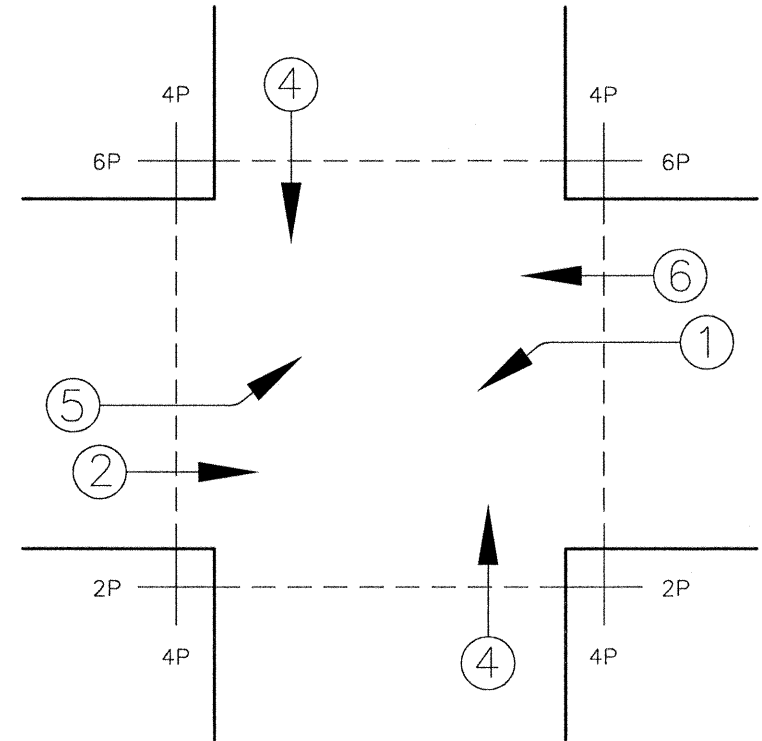
STANDARDS FOR
SIGNAL
PLACEMENT

STANDARD PLAN NO. TS-14

"P" CABINET



"M" CABINET



PEDESTRAIN SIGNAL WIRING

RED	N/S - DW
GREEN	N/S - WK
ORANGE	E/W - DW
BLACK	E/W - WK
WHITE	NEUTRAL

PEDESTRAIN PUSH BUTTON WIRING

RED	N/S
GREEN	SPARE
ORANGE	SPARE
*BLACK	E/W
WHITE	COMM BETWEEN PUSH BUTTONS

*BLACK used when only one
Push Button is used.

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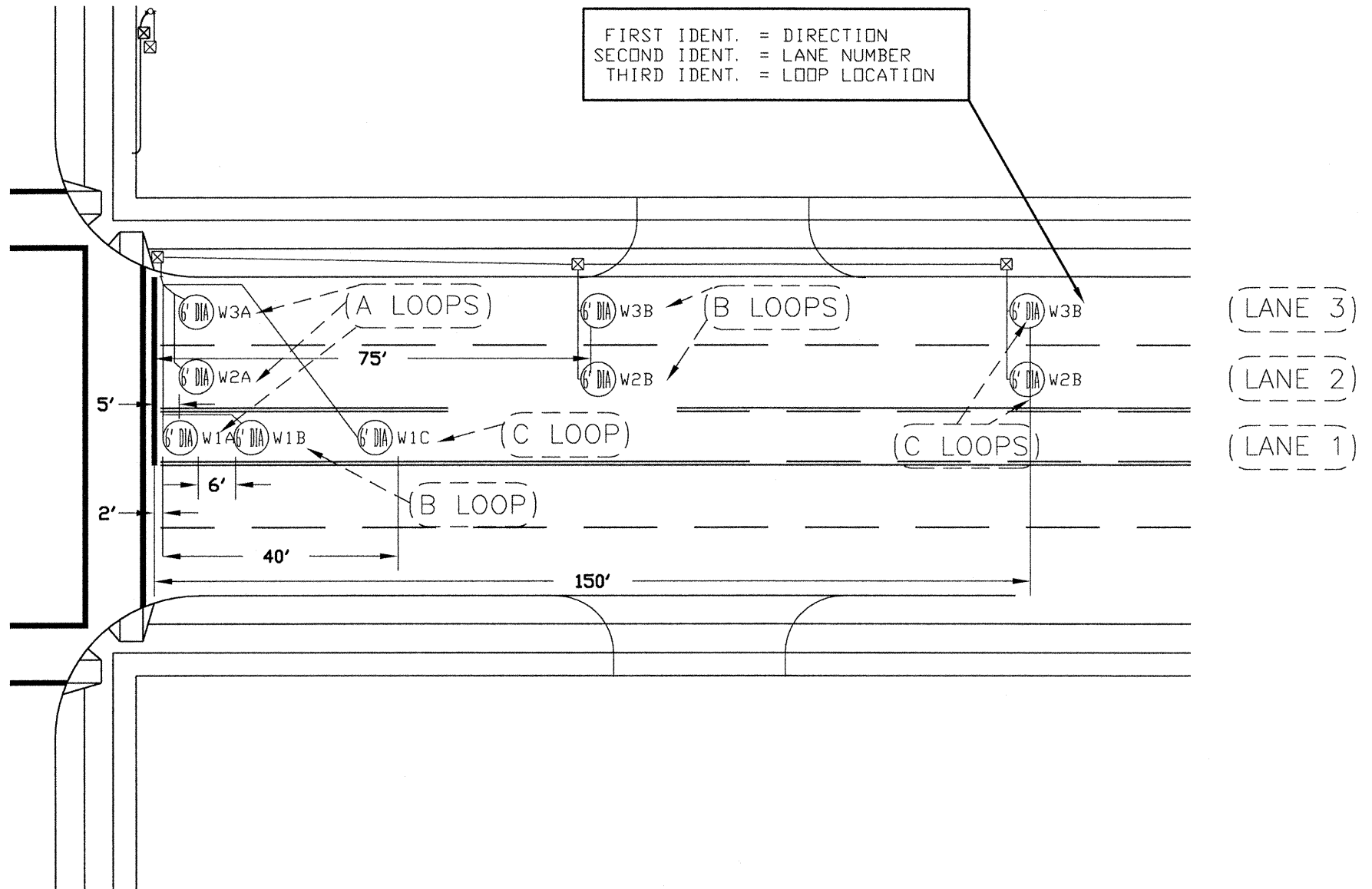
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TRAFFIC SIGNAL
PHASE ORIENTATION

STANDARD PLAN NO. TS-15



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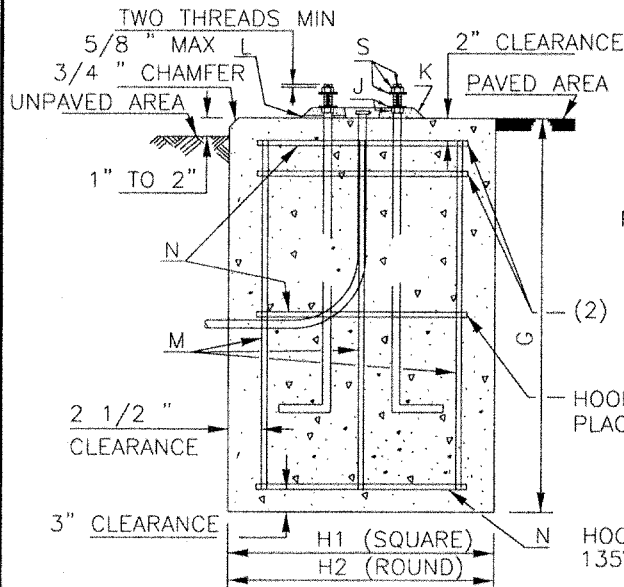
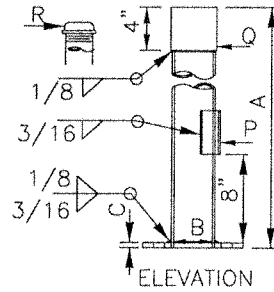
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VEHICLE INDUCTION LOOP
TYPICAL LAYOUT

STANDARD PLAN NO. TS-16

Figure 1 shows the plan view of a square plate with side length D . A central circular hole with diameter D is present. Four corner fasteners are shown, with dimensions E and P indicating their positions relative to the plate edges and the hole.



TYPE PPB
PED. PUSH
BUTTON
POST

TYPE PS
PED. HEAD
STANDARD

TYPE I & RM
VEHICLE HEAD
AND RAMP METER
STANDARD

TYPE FB
FLASHING
BEACON
STANDARD

TYPE II
MAST ARM
STANDARD

TYPE III
LIGHTING AND
MAST ARM
STANDARD

TYPE IV
STRAIN POLE
STANDARD

TYPE V LIGHTING AND STRAIN POLE STANDARD

SIGNAL STANDARD TYPE DESIGNATIONS

TYPE PPB, PS, I, RM & FB STANDARD DIMENSION CHART

MARK	ITEM	TYPE PPB	TYPE PS	TYPE I	TYPE RM	TYPE FB
A	HEIGHT	4"-6"	8'-0"	10'-0"	SHEET 2	SHEET 2
B	POLE BASE DIA	2 1/2 "	*	*	*	*
C	PLATE THICKNESS	1/2 "	1/2 "	1/2 "	SHEET 2	SHEET 2
D	PLATE WIDTH	5"	9"	9"	SHEET 2	SHEET 2
E	HOLE DIA	5/8 "	1"	1"	SHEET 2	SHEET 2
F	BOLT CIRCLE	4 1/2 "	8 1/2 "	8 1/2 "	SHEET 2	SHEET 2
G	FOUNDATION DEPTH	1'-6"	3'-0"	3'-0"	3'-0"	3'-0"
H1	FOUNDATION WIDTH	1'-6"	2'-0"	2'-0"	2'-0"	2'-0"
H2	FOUNDATION DIA	2'-0"	2'-3"	2'-3"	2'-3"	2'-3"
J	NUT & WASHER	FOUR 1/2 "	3/4 "	3/4 "	3/4 "	3/4 "
K	GROUT PAD THICKNESS	NONE	**	**	SHEET 2	SHEET 2
L	PLASTIC DRAIN TUBE DIA	NONE	3/8 "	3/8 "	3/8 "	3/8 "
M	VERTICAL RE-BAR	NONE	EIGHT #4	EIGHT #4	EIGHT #4	EIGHT #4
N	HORIZ. RE-BAR HOOP	NONE	SIX #4	SIX #4	SIX #4	SIX #4
P	HANDHOLE SIZE	NONE	3-1/2"x4"	3-1/2"x4"	3-1/2"x4"	3-1/2"x4"
Q	SLIPFITTER DIA (I.D.)	NONE	4"	4"	4"	4"
R	CAP DIA	2 1/2 "	NONE	NONE	NONE	NONE

* TAPERED ROUND OR OCTAGONAL SHAFT, 11 GAGE, 4" OD AT SLIPFITTER WELD.

** LEVELING NUT HEIGHT 1" MAXIMUM.

LEVELING NUTS NOT REQUIRED FOR TYPE PPB STANDARD

TAPER = 0.14 INCHES/FT.

ANCHOR BOLT, NUT, & WASHER SIZES

MARK	STANDARD	DIMENSIONS
S	TYPE PPB	4 - 1/2 " DIA x 12" x 2"
S	TYPE PS & I	4 - 3/4 " DIA x 30" x 4"
S	TYPE FB & RM	3 - 3/4 " DIA x 30" x 4"

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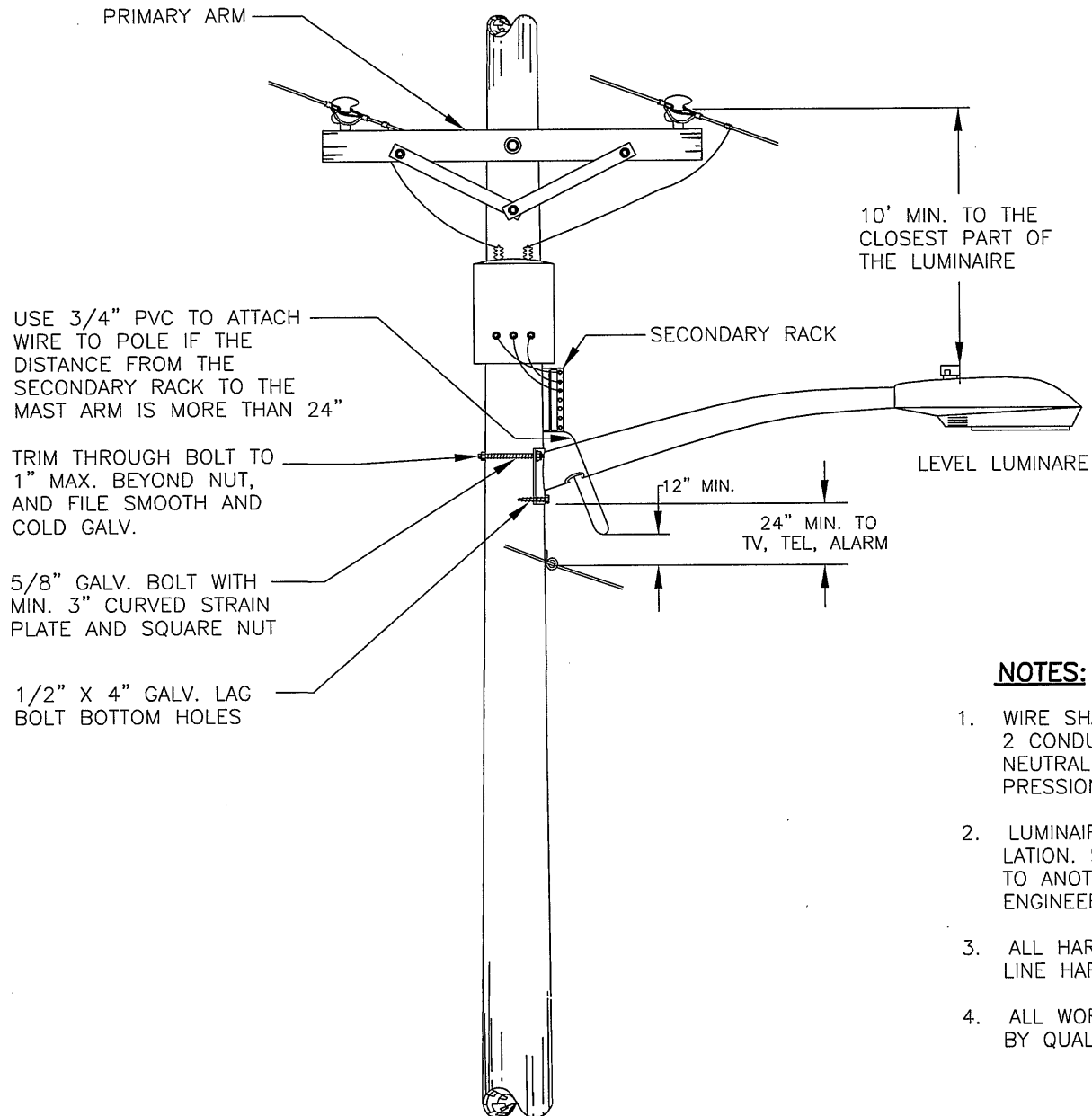
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**SIGNAL STANDARD TYPE
DESIGNATIONS AND TYPE
PPB, PS, I, RM, & FB DETAILS**

STANDARD PLAN NO. TS-17



NOTES:

1. WIRE SHALL BE MINIMUM #10 AWG COPPER 2 CONDUCTOR. CONNECT TO 240 VOLT, NO NEUTRAL OR GROUND CONNECTION. USE COMPRESSION CONNECTORS APPROVED BY ENGINEER.
2. LUMINAIRES SHALL BE LEVELED AFTER INSTALLATION. SOCKET POSITION SHALL BE ADJUSTED TO ANOTHER POSITION IF REQUESTED BY THE ENGINEER BEFORE INSTALLATION.
3. ALL HARDWARE SHALL BE HOT DIP GALVANIZED LINE HARDWARE.
4. ALL WORK ON UTILITY POLES TO BE PERFORMED BY QUALIFIED LINEMEN.

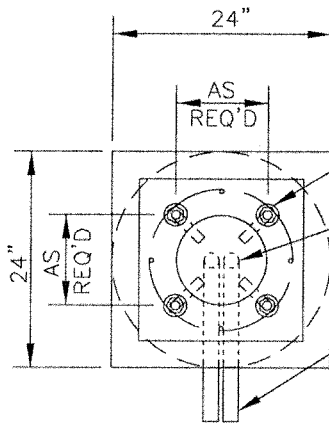
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STREETLIGHT
LUMINAIRE ON WOOD POLE
TYPICAL INSTALLATION
STANDARD PLAN NO. SL-01

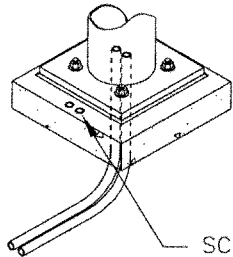


TOOL FINISH TOP AND EDGES

4EA ANCHOR BOLTS
MINIMUM TOP 8" OF BOLT SHALL BE GALVANIZED
(AASHTO M111)

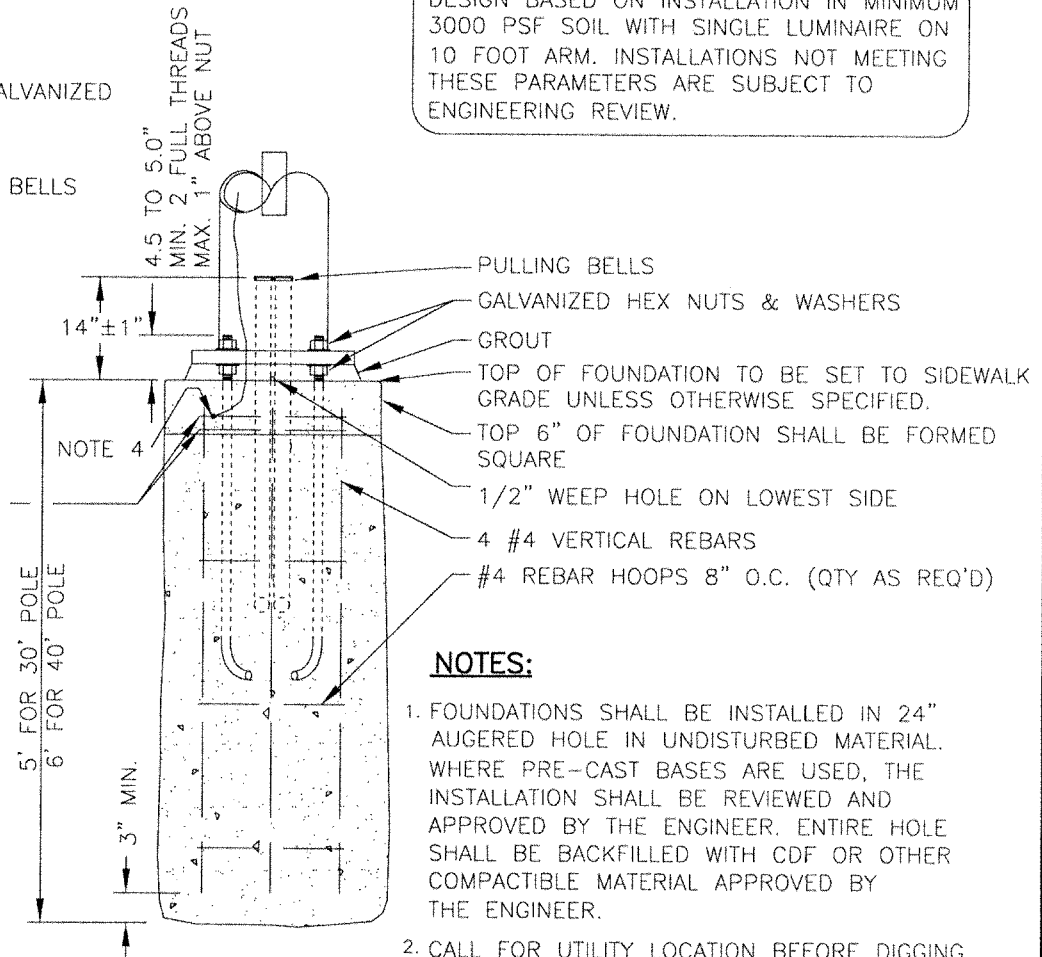
CONDUIT SHALL BE CENTERED ON POLE
W/CLEARANCE FOR COUPLINGS/PULLING BELLS

THERE SHALL BE A MINIMUM OF TWO
CONDUITS IN EACH FOUNDATION.
CONDUIT SHALL HAVE 18" RADIUS AND
BE ORIENTED TO MINIMIZE CONDUIT
BENDS.



SCRIBE A CIRCLE WITH END
OF CONDUIT ABOVE EACH
CONDUIT ENTERING THE
FOUNDATION.

(2) HOOPS WITHIN 5" OF TOP



DESIGN BASED ON INSTALLATION IN MINIMUM
3000 PSF SOIL WITH SINGLE LUMINAIRE ON
10 FOOT ARM. INSTALLATIONS NOT MEETING
THESE PARAMETERS ARE SUBJECT TO
ENGINEERING REVIEW.

NOTES:

1. FOUNDATIONS SHALL BE INSTALLED IN 24" AUGERED HOLE IN UNDISTURBED MATERIAL. WHERE PRE-CAST BASES ARE USED, THE INSTALLATION SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. ENTIRE HOLE SHALL BE BACKFILLED WITH CDF OR OTHER COMPACTIBLE MATERIAL APPROVED BY THE ENGINEER.
2. CALL FOR UTILITY LOCATION BEFORE DIGGING (1-800-424-5555)
3. ALL STEEL TO HAVE 3" MINIMUM CONCRETE COVER. HOOPS SHALL HAVE 135° HOOKS. ANCHOR BOLTS MAY BE SECURED TO HOOPS.
4. BOND CAGE TO GROUND LUG.

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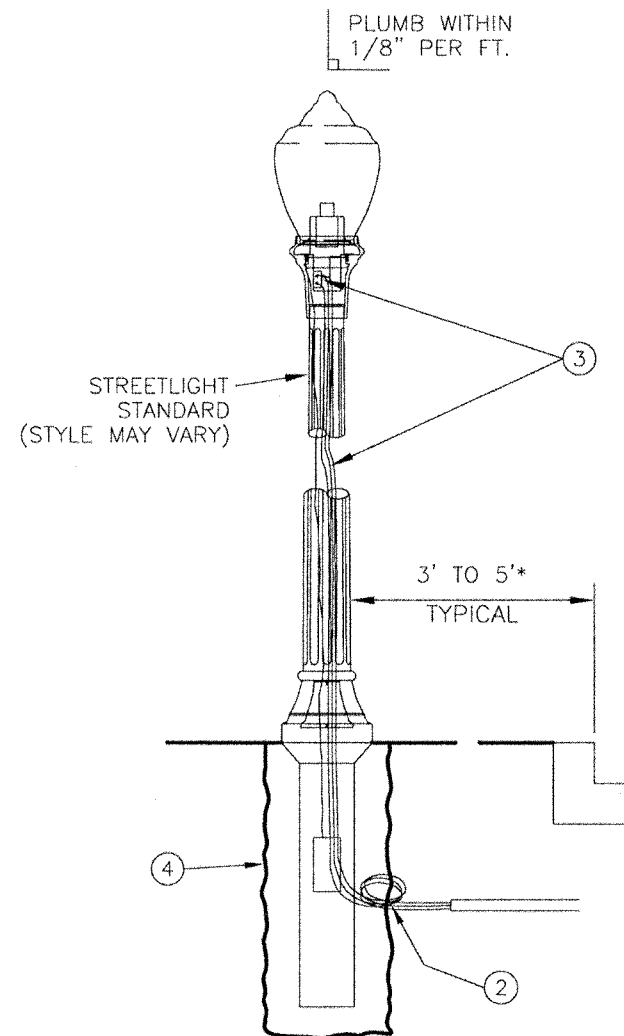
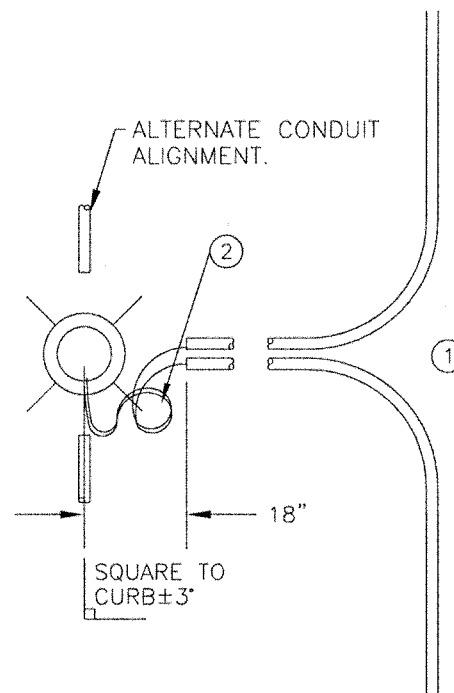
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STREETLIGHT
FOUNDATION
30' & 40'

STANDARD PLAN NO. SL-02

NOTES:

- ① INTERCEPT EXISTING CONDUIT, WHERE APPLICABLE, AND ROUTE TOWARD LIGHT STANDARD. TERMINATE CONDUIT(S) APPROXIMATELY 12" FROM BASE OF STANDARD. SEAL END OF CONDUITS WITH TAPE.
- ② COIL THREE FEET OF WIRE AT END OF CONDUIT BEFORE ENTERING BASE OF STANDARD.
- ③ ROUTE WIRE UP TO TERMINAL BLOCK WITHOUT SPLICING.
- ④ MINIMUM AUGER SIZE IS 12". BACKFILL WITH CRUSHED SURFACING TOP COURSE. TAMP IN 6 INCH LIFTS.
- ⑤ SQUARE POLE TO CURB ± 3 DEGREES.



* OR AS DETERMINED BY ENGINEER

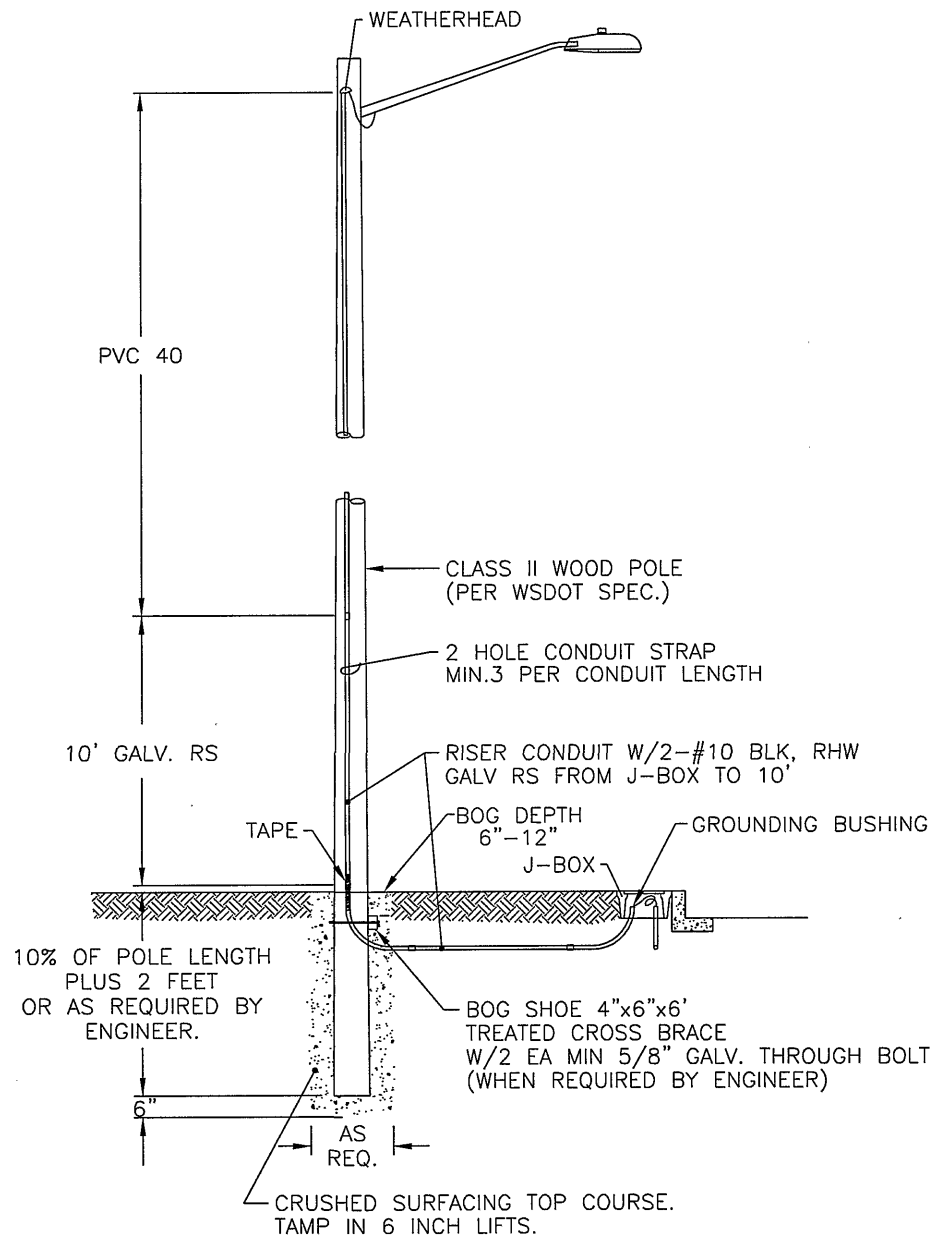
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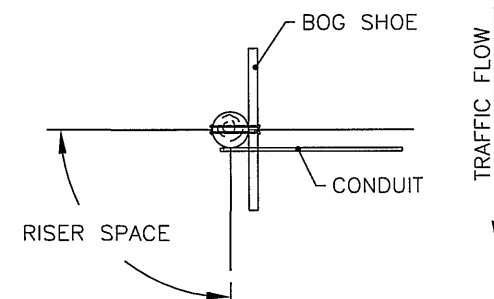
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STREETLIGHT
STANDARD EMBEDDED TYPE
INSTALLATION DETAIL-TYPICAL
STANDARD PLAN NO. SL-03



THIS INSTALLATION IS FOR WOOD POLES
WITH ONLY STREETLIGHTING INSTALLED
ON THE POLE. DO NOT USE ON
TACOMA POWER UTILITY POLES.



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STREETLIGHT
ON TIMBER POLE TYPICAL
INSTALLATION W/UNDERGROUND FEED
STANDARD PLAN NO. SL-04

STREETLIGHTING TAP
FOR USE IN BASE OF STANDARDS

TAPING INSTRUCTIONS

1. MAKE SPLICE AS SHOWN IN FIGURE A
2. APPLY TAPE AS SHOWN IN FIGURE A
APPLY TAPE AND "SCOTHKOTE" MOISTURE
RESISTANT ELECTRICAL COATING OVER
ENTIRE SPLICE AREA.
3. ATTACH CABLE TIE A MINIMUM OF 2" FROM
THE PRESSURE CONNECTOR AS SHOWN IN FIGURE B.
4. APPLY SECOND COAT OF VARNISH.

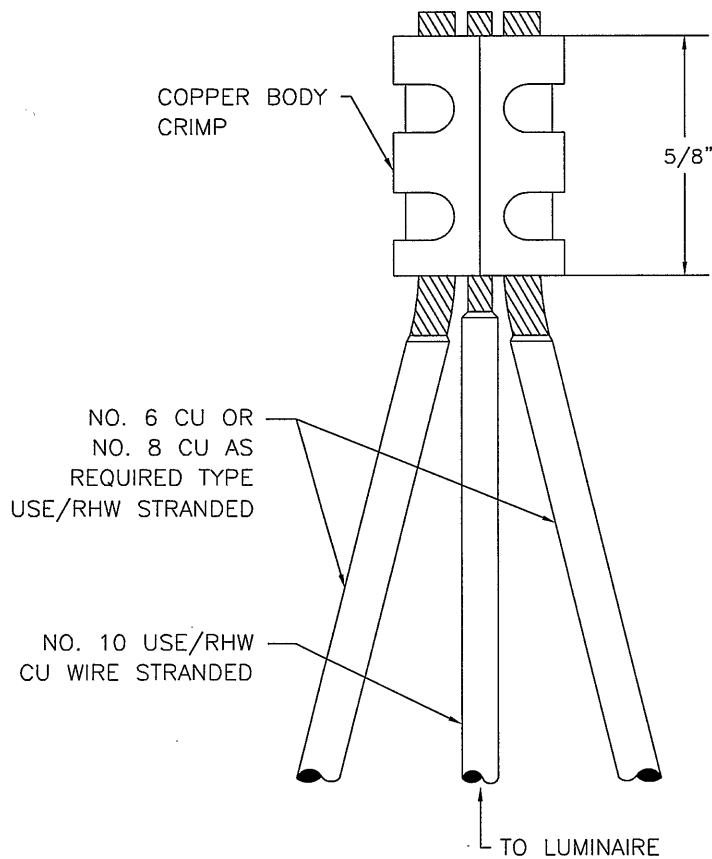


FIGURE A

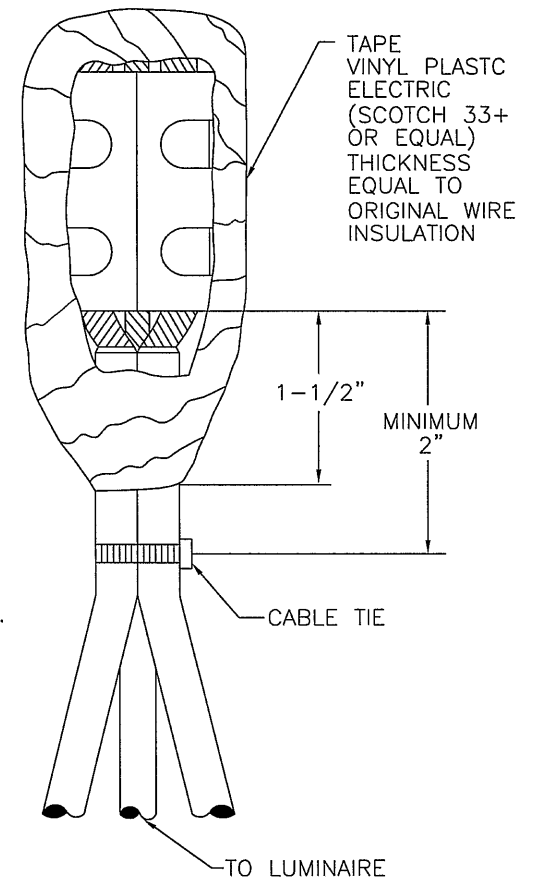


FIGURE B

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**STREETLIGHT
SPLICE FOR
HANDHOLES**

STANDARD PLAN NO. SL-05

WOOD POLES:

2" NUMBERS

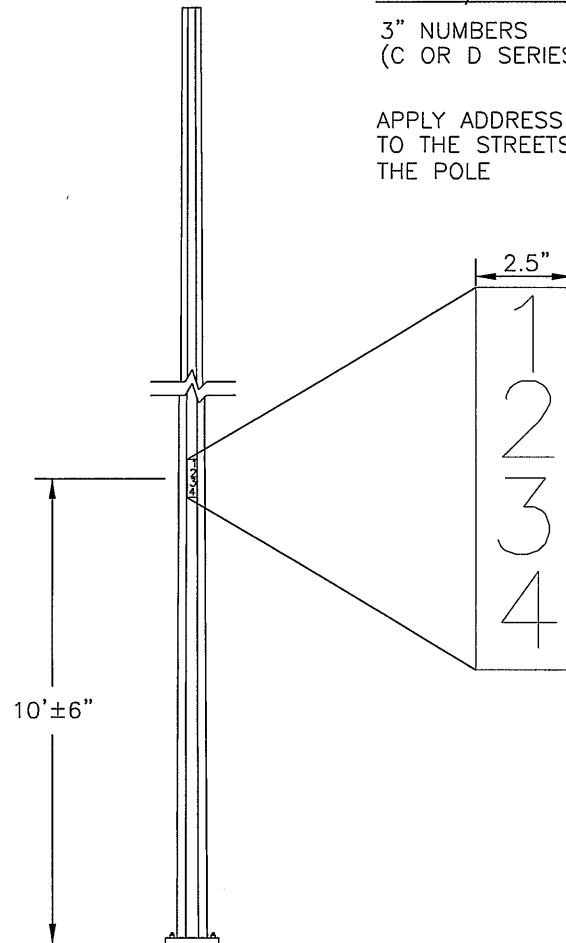
NAIL ON ALUMINUM NUMBERS

METAL/CONCRETE/FIBERGLASS POLES

3" NUMBERS

(C OR D SERIES)

APPLY ADDRESS NUMBERS
TO THE STREETSIDE OF
THE POLE



COLORS:

CONCRETE POLES:

BACKGROUND: LIGHT BEIGE
FOREGROUND: DARK BROWN

UNPAINTED ALUMINUM
OR GALVANIZED POLES:

BACKGROUND: NONE
FOREGROUND: BLACK

IF THERE ARE EXISTING
NUMBERS ON POLE
PAINT OVER OR REMOVE OLD NUMBERS

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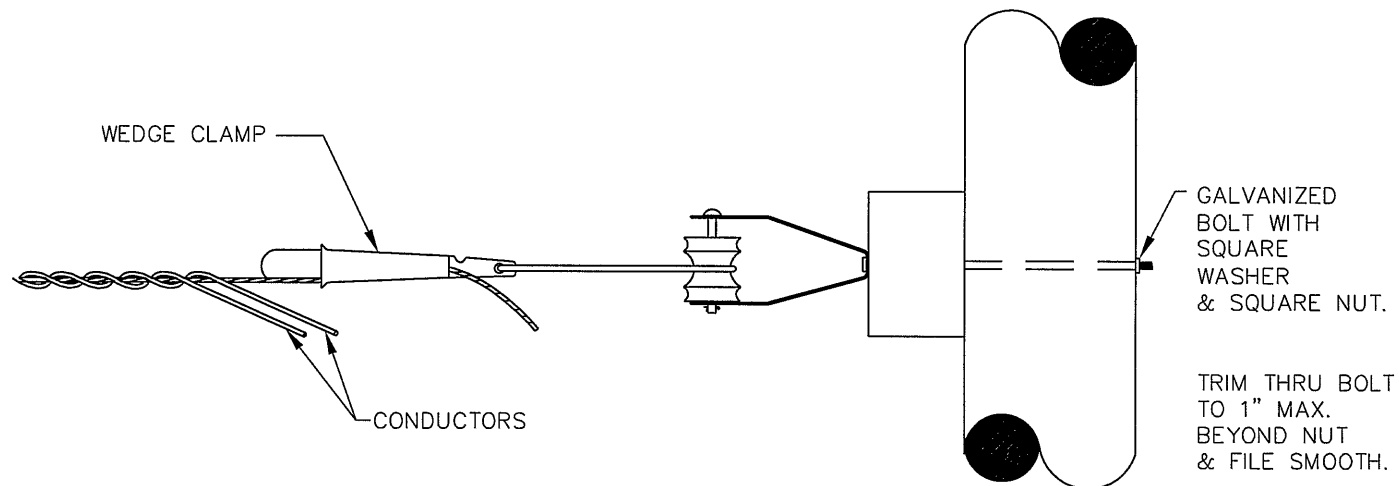
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STREETLIGHT
POLE ADDRESSES
TYPICAL DETAIL

STANDARD PLAN NO. SL-06



MAXIMUM TENSION = 100 POUNDS
TYPICAL
MAXIMUM SPAN LENGTHS

TRIPLEX SIZE SAG	1/0	#2	#4	#6
2.5 FEET	65	85	105	125
5 FEET	95	120	150	180
7.5 FEET	115	150	180	220

WOOD POLE

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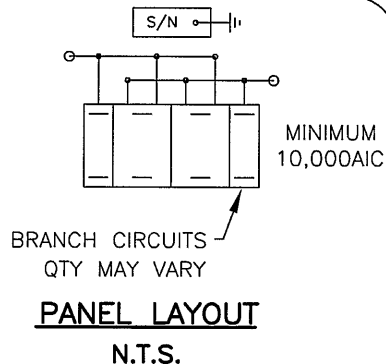
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STREETLIGHT
OVERHEAD TRIPLEX SPANS
TYPICAL INSTALLATION
STANDARD PLAN NO. SL-07

WHEN SERVING FROM TRANSFORMERS LARGER THAN 50 KVA AN EVALUATION OF INTERRUPT CAPACITY OF THE SERVICE EQUIPMENT IS REQUIRED.



SIZE OF BRANCH CIRCUIT CONDUCTOR	MAXIMUM BREAKER SIZE *
#8 AWG COPPER	30AMP
#6 AWG COPPER	40AMP

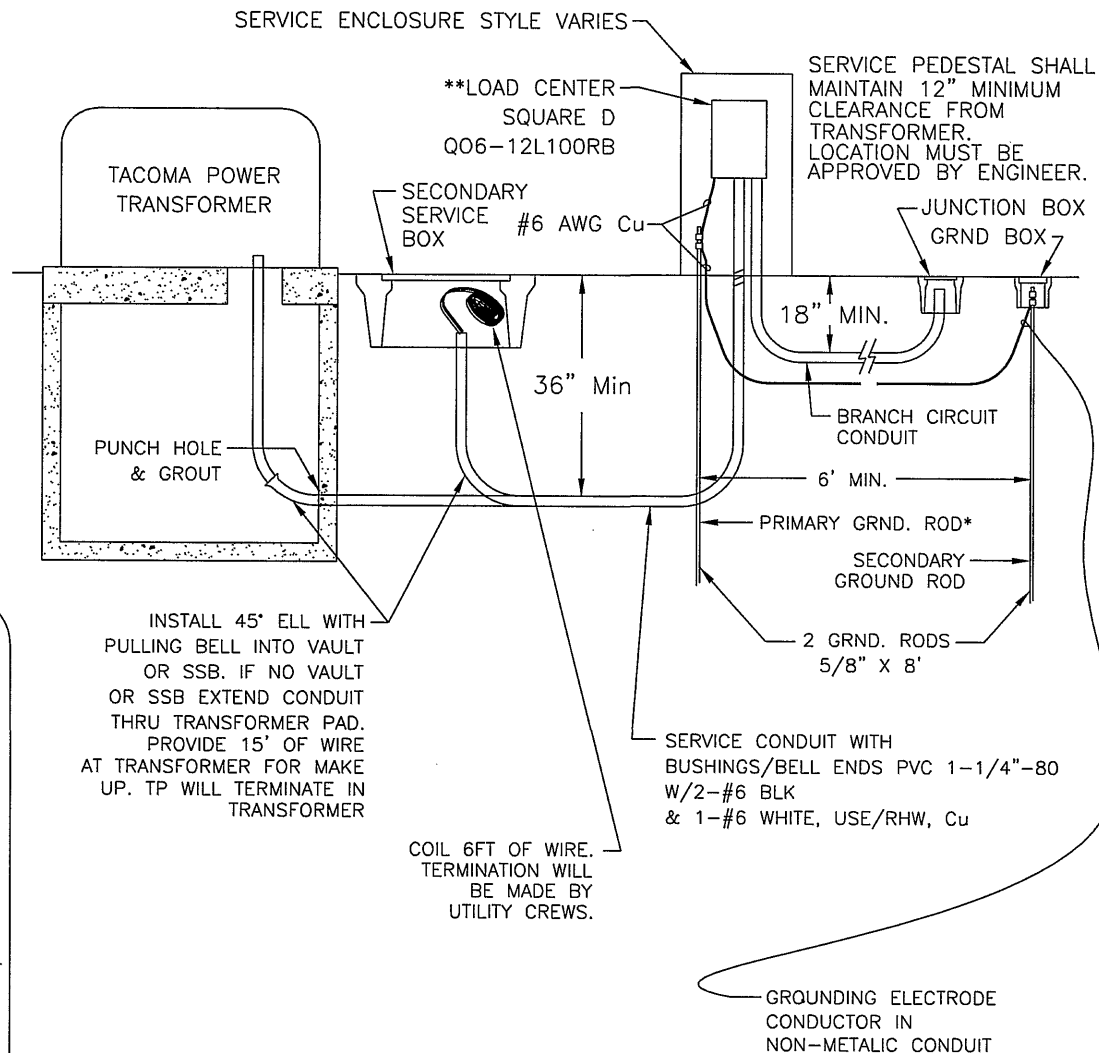
* SIZE BASED ON ENSURING BREAKER WILL TRIP ON FAULTS AT END OF LONG CIRCUITS.

PROCEDURE:

1. OBTAIN ELECTRICAL PERMIT FROM TACOMA POWER FOR EACH ELECTRICAL SERVICE.
2. COMPLETE SERVICE PANEL INSTALLATION EXCEPT FOR ENTERING TRANSFORMER VAULT OR PAD. FOR SSB INSTALLATIONS, INSTALL CONDUIT AND WIRE INTO SSB.
3. PREFERRED PRACTICE IS TO OBTAIN SERVICE FROM SSB. CONTACT TACOMA POWER BEFORE SERVICING STREETLIGHTS FROM TRANSFORMER.
4. ARRANGE FOR ELECTRICAL INSPECTION AND CUT-IN BY TACOMA POWER (502-8277).
5. AFTER TACOMA POWER ACCEPTANCE OF SERVICE PANEL CONTACT THE UNDERGROUND RESIDENTIAL DISTRIBUTION (URD) OFFICE (502-8232) TO ARRANGE FOR CONDUIT AND CONDUCTOR ENTERANCE INTO TRANSFORMERS.

*6. PRIMARY GROUND ROD MAY BE LOCATED OUTSIDE OF SERVICE ENCLOSURE IN GROUND ROD BOX.

**7. DO NOT PENETRATE OUTER WALL OF ENCLOSURE WHEN MOUNTING EQUIPMENT HARDWARE.



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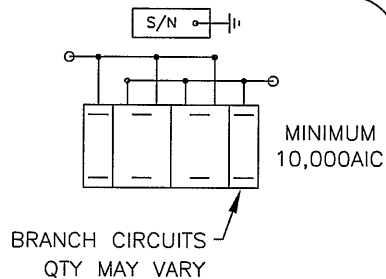
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STREETLIGHT
SERVICE DETAIL
UNDERGROUND TYPE A

STANDARD PLAN NO. SL-08

WHEN SERVING FROM TRANSFORMERS LARGER THAN 50 KVA AN EVALUATION OF INTERRUPT CAPACITY OF THE SERVICE EQUIPMENT IS REQUIRED.



PANEL LAYOUT

N.T.S.

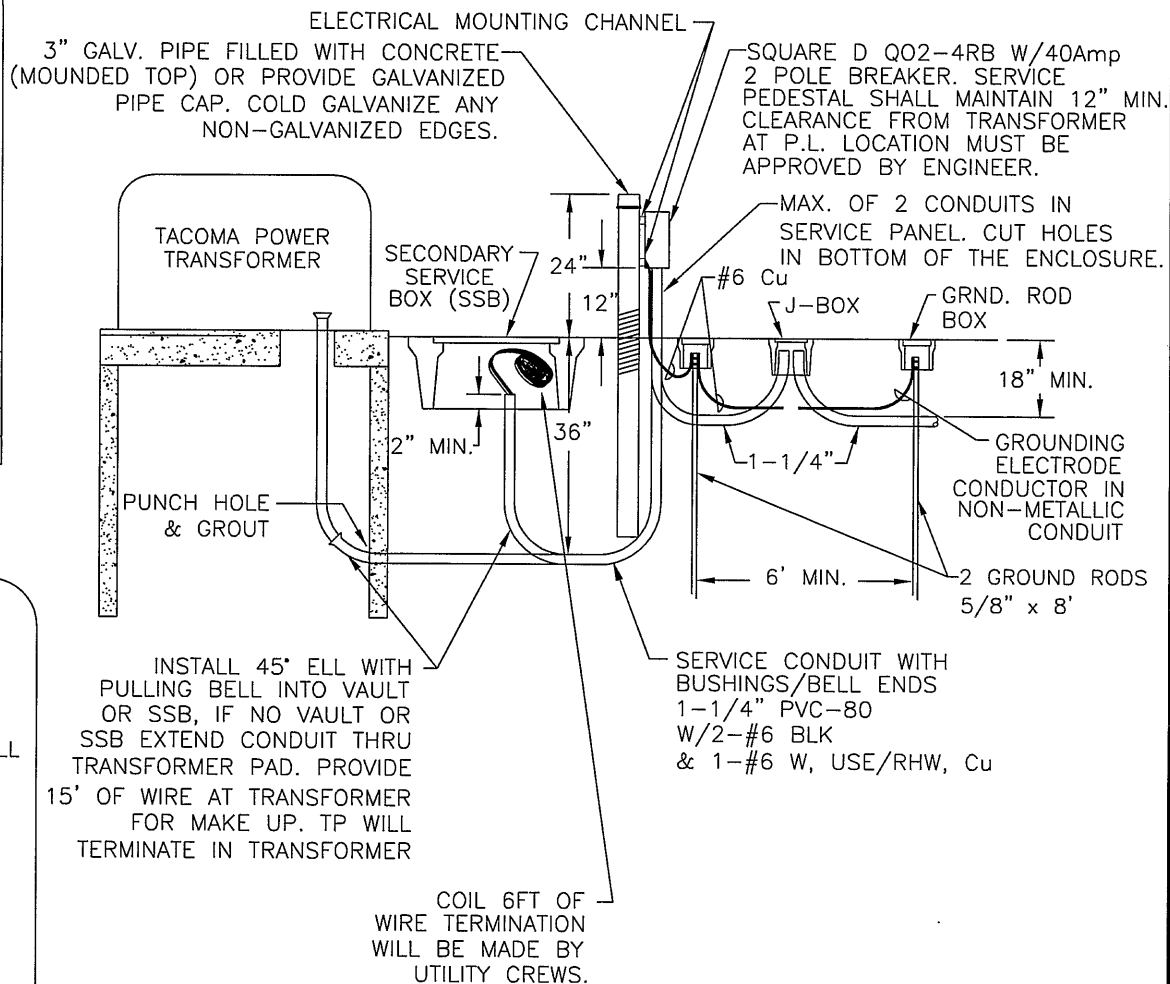
SIZE OF BRANCH CIRCUIT CONDUCTOR	MAXIMUM BREAKER SIZE *
#8 AWG COPPER	30AMP
#6 AWG COPPER	40AMP

* SIZE BASED ON ENSURING BREAKER WILL TRIP ON FAULTS AT END OF LONG CIRCUITS.

PROCEDURE:

1. OBTAIN ELECTRICAL PERMIT FROM TACOMA POWER FOR EACH ELECTRICAL SERVICE.
2. COMPLETE SERVICE PANEL INSTALLATION EXCEPT FOR ENTERING TRANSFORMER VAULT OR PAD. FOR SSB INSTALLATIONS, INSTALL CONDUIT AND WIRE INTO SSB.
3. PREFERRED PRACTICE IS TO OBTAIN SERVICE FROM SSB. CONTACT TACOMA POWER BEFORE SERVICING STREETLIGHTS FROM TRANSFORMER.
4. ARRANGE FOR ELECTRICAL INSPECTION AND CUT-IN BY TP (502-8277).
5. AFTER TP ACCEPTANCE OF SERVICE PANEL CONTACT THE UNDERGROUND RESIDENTIAL DISTRIBUTION (URD) OFFICE (502-8232) TO ARRANGE FOR CONDUIT AND CONDUCTOR ENTRANCE INTO TRANSFORMERS.

**6. DO NOT PENETRATE OUTER WALL OF ENCLOSURE WHEN MOUNTING EQUIPMENT HARDWARE.



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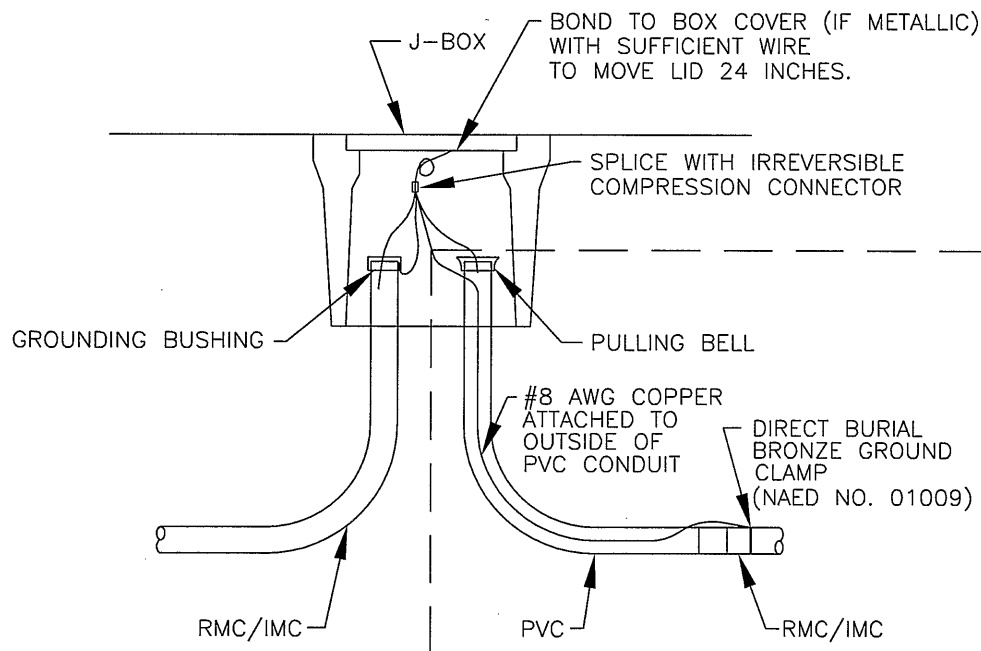
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER

DATE 2/4/03

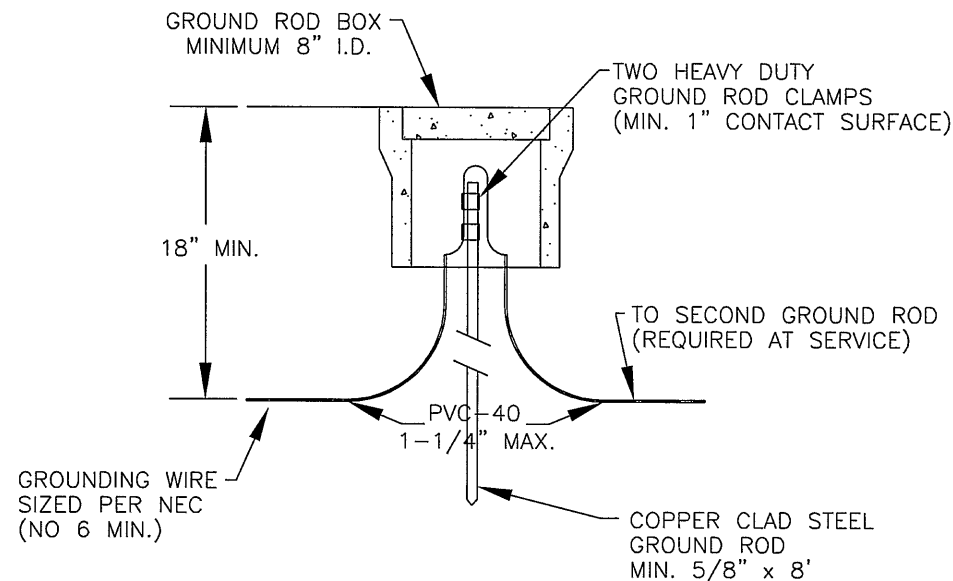
STREETLIGHT
SERVICE DETAIL
UNDERGROUND TYPE B

STANDARD PLAN NO. SL-09



CONDUIT GROUNDING

USE WHERE STEEL CONDUIT DOES NOT EXTEND TO JUNCTION BOX OR OTHER TERMINATION POINT.



GROUND ROD INSTALLATION

NOTES:

1. ALL STREETLIGHT CONDUITS SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR.
2. METALLIC CONDUIT SHALL BE BONDED AT BOTH ENDS TO THE EQUIPMENT GROUNDING CONDUCTOR.
3. EQUIPMENT GROUNDING CONDUCTORS SHALL BE STRANDED INSULATED COPPER.

**CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS**

APPROVED FOR PUBLICATION

CITY ENGINEER

[Signature]
DATE 2/4/03

STREETLIGHT

GROUNDING DETAIL

STANDARD PLAN NO. SL-10

Appendix B

City of Tacoma Public Works Work Order Checklist

Please note that this is a partial checklist only to assist the design engineer
In the preparation of a private work order plan sheet and is not intended to be all inclusive.

N/A Done

CONDITION OF IMPROVEMENT

- ☐ ☐ Hearings Examiners report and conditions / or off site improvement requirements addressed.
- ☐ ☐ Check for additional requirements for projects located in a historical district.

PLAN LAY-OUT FORMATING

On plans:

- ☐ ☐ North arrow (north arrow on plan sheets points up or to the right)
- ☐ ☐ Vicinity map.
- ☐ ☐ Scale (Horz.: 1"=20') (Vert.: 1"=5')
- ☐ ☐ Street names in both plan and profile.
- ☐ ☐ Shading of new construction.

Control:

- ☐ ☐ Vertical control -- City of Tacoma Bench Mark (with description)
- ☐ ☐ Vertical datum (City of Tacoma N.G.V.D. - 1929)
- ☐ ☐ Proper tie into monument system. (Tied between two known monuments with bearing)
- ☐ ☐ Description of monuments (ie: mon. in case, surface brass, etc.)

Title Block Information:

- ☐ ☐ Company name, address, phone # of designing engineer.
- ☐ ☐ Proper signature in signature block. (Assistant Division Manager/Construction Division)
- ☐ ☐ Engineer's Stamp, signature, signature date and license expiration date.
- ☐ ☐ Proper title block description. (Cross Streets and type of work)
- ☐ ☐ Work order number included on plans.

DESIGN CRITERIA SANITARY SEWER

General:

- ☐ ☐ Verify and review As-built for existing system at tie in location.
- ☐ ☐ Show all utility crossings in the profile.

Manholes:

- ☐ ☐ Target minimum mainline invert depth is 10ft.
- ☐ ☐ Labels each manhole with type, station, offset, and diameter.
- ☐ ☐ Minimum 0.1 foot fall across the manhole. (No drop connections allowed)
- ☐ ☐ Provide a crown to crown connection when pipes of diff. diameter are connected to a common structure.
- ☐ ☐ Verify manhole is large enough to accommodate all incoming/outgoing pipes.
- ☐ ☐ Check vertical and horizontal dimensions for construct ability of structure.

Mainline:

- ☐ ☐ Minimum 1.0% mainline slope (Minimum 8" pipe) or provide calcs showing min. vel. is over 2.0 ft/sec.
- ☐ ☐ Label: specific pipe material, length, slope, and diameter for all pipes.
- ☐ ☐ Steep Slopes: Pipe anchors required? (No Kor-N-Seal for slopes greater than 15%)
- ☐ ☐ Address reconnection for shoe string laterals.
- ☐ ☐ Target maximum pipe length -- 300 feet.
- ☐ ☐ Class 900 PVC (or Ductile Iron Pipe) for "backyard easements".

Laterals:

- ☐ ☐ Six(6) inch laterals extend 5 feet beyond prop. line (or common utilities trench where applicable)
- ☐ ☐ Station of all laterals with 5' minimum cover at prop. line. (2% min.)
- ☐ ☐ Maximum of two laterals entering into dead-end manhole.
- ☐ ☐ No sanitary tees or flexible joints within 10' from the manhole for flexible pipes)
- ☐ ☐ Minimum three (3) feet between sanitary tees.

N/A Done

DESIGN CRITERIA STREET IMPROVEMENT

Patching into existing Pavement:

- ☐ ☐ Show existing centerline elevations for cross slope determination. (longitudinal patch)
- ☐ ☐ Cross sections shown every 25-50 ft. (Const. gutter, meetline, existing centerline)
- ☐ ☐ Meetline clearly defined and provides acceptable slopes.
- ☐ ☐ Proper taper length where applicable. (See MUTCD)

Dead Ends:

- ☐ ☐ Barricades or End of Road Markers required at dead-end
- ☐ ☐ Turn-a-rounds required for dead ends in excess of 150 ft

Grades, slopes and curves:

- ☐ ☐ Grades shown correctly in profile.
- ☐ ☐ Top of curb (L&R) elevations shown every 50' min and every 25' min in horizontal and/or vertical curves.
- ☐ ☐ Minimum longitudinal slope for cement concrete curb and gutter - 0.4%
- ☐ ☐ Minimum longitudinal slope for asphalt wedge curb - 1.0% (note: this may drive street design)
- ☐ ☐ Maximum of 6% intersection cross slope.
- ☐ ☐ Maximum grade break of 1% without vertical curve.
- ☐ ☐ Maximum slope for arterials - 12%, Maximum slope for residential streets - 15%
- ☐ ☐ Horizontal Curves conform to AASHTO.
- ☐ ☐ Vertical Curves conform to AASHTO.

Other:

- ☐ ☐ Fills over one foot in depth address compaction method and materials.
- ☐ ☐ Construct new or replace existing monuments within City R/W.
- ☐ ☐ Comb. sidewalk shall be 7' adjacent to commercial sites and on arterial streets.
- ☐ ☐ Check typical cross-section against City of Tacoma Standard.
- ☐ ☐ Streetlighting Required? Contact Traffic Engineering to set up Street Lighting Work Order. (591-5500)
- ☐ ☐ Provide 10' wide conc. slab in street return (at E.R.) for Private Street serving a Plat
- ☐ ☐ Catch points shown for all cuts or fills over 1 ft in depth.
- ☐ ☐ Centerline stations shown for all driveways to be constructed under this work order
- ☐ ☐ Sidewalks identified as to be constructed under building permit stage or as a part of this work order

DESIGN OF PRIVATE ACCESSWAYS

Use this checklist for private access ways serving 4 or fewer lots.

- ☐ ☐ Verify recorded short plat matches work order plans. (i.e. Horizontal Control, Easement limits, etc.)
- ☐ ☐ Private Access Way entrance has Cem. Concrete Driveway Entrance Type 1 or 2 (when tied into curb and gutter).
- ☐ ☐ Verify driveway is not in conflict with the Driveway Control Ordinance.
- ☐ ☐ Distinguish between Private/Public Easements and Improvements/Utilities.
- ☐ ☐ Street Pavement section corresponds with City requirements
- ☐ ☐ Meeting AASHTO Standards for design of private roads recommended.
- ☐ ☐ Verify turn-around meets conditions
- ☐ ☐ Verify elevations at back of driveway match profiles for private access way.
- ☐ ☐ That portion of the private storm located within the R/W is shown on the plan as a part of the work order.
- ☐ ☐ Cut and fill catch points where required.

ADDITIONAL INFORMATION REQUEST

- ☐ ☐ Grading and Erosion control (not covered on Grading Permit) shown on plan.
- ☐ ☐ Special traffic control requirements.
- ☐ ☐ Easements shown on plan, properly sized and recorded where applicable.
- ☐ ☐ Storm detention requirement satisfied.
- ☐ ☐ Private storm drainage requirement satisfied.
- ☐ ☐ In lieu of assessment release form signed and returned for sanitary sewers.
- ☐ ☐ All necessary private property construction permits completed.
- ☐ ☐ Environmental check list complete.
- ☐ ☐ Storm Quality requirement satisfied.

N/A Done

DESIGN CRITERIA STORM SEWER

General:

- ☐ ☐ Verify and review City record drawings for existing system at tie in location
- ☐ ☐ Show all utility crossings in the profile. Check horiz. and vert. sep. for all Utilities. (incl. Thrust blocks)

Manholes:

- ☐ ☐ Labels each manhole with type, station, offset and diameter.
- ☐ ☐ Target minimum mainline invert depth of 6 ft
- ☐ ☐ Minimum 0.1 foot fall across the manhole. (No drop connections allowed on mainline connections)
- ☐ ☐ Provide a crown to crown connection when pipes of diff. diameter are connected to a common structure.
- ☐ ☐ Manholes shall be 10' min. down stream from catch basins.
- ☐ ☐ Verify manhole is large enough to accommodate all incoming/outgoing pipes.
- ☐ ☐ Check vertical and horizontal dimensions for construct ability of structure.

Catch Basins:

- ☐ ☐ Labels each catch basin with type, station, and offset. (generally Type I)
- ☐ ☐ Minimum catch basin invert depth of 3 ft + pipe diameter for PVC and non-reinforced conc. (max. - 5 ft.)
- ☐ ☐ Crown of top pipe - Invert of bottom pipe must be less than 1.8 feet for Type I CB
- ☐ ☐ Catch basins shall not be in conflict with curb ramps, driveways, utilities etc...

Pipes:

- ☐ ☐ Target minimum slope of 0.5% for storm mainlines.
- ☐ ☐ Minimum 10" dia. mainline -- Minimum 8" dia. catch basin lead
- ☐ ☐ Minimum cover for PVC and non-reinforced concrete pipe 3 ft.
- ☐ ☐ Label: specific pipe material, length, slope, and diameter for all pipes
- ☐ ☐ Target maximum mainline length -- 300 feet.
- ☐ ☐ Pipe anchors required?
- ☐ ☐ Steep Slopes: Pipe anchors required? (No Kor-N-Seal for slopes greater than 15%)
- ☐ ☐ Class 900 PVC (or Ductile Iron Pipe) for "backyard easements".

DETAILS AND NOTES

Applicable notes and details to be shown on the work order plans.

- ☐ ☐ As-built Criteria
- ☐ ☐ Work Order Standard Specifications
- ☐ ☐ Staking notes and detail
- ☐ ☐ Erosion control notes
- ☐ ☐ Applicable Items found on the Erosion control checklist.
- ☐ ☐ Traffic control notes
- ☐ ☐ Poured Monument Detail.
- ☐ ☐ Typical cross section for each street.
- ☐ ☐ Intersection details.
- ☐ ☐ Alley return (Cem. Concrete Driveway Entrance, Type 3).
- ☐ ☐ Driveways (Cem. Concrete Driveway Entrance, Type 1)
- ☐ ☐ Driveway (Cem. Concrete Driveway Entrance, Type 2)
- ☐ ☐ Curb and Gutter Detail.
- ☐ ☐ Wheelchair ramp detail.
- ☐ ☐ Barricade detail
- ☐ ☐ Turnaround detail w/ spot elevations
- ☐ ☐ Pipe bedding detail.
- ☐ ☐ Manhole Type I detail.
- ☐ ☐ Manhole Type II detail.
- ☐ ☐ Pavement patch for asphalt.
- ☐ ☐ Pavement patch for concrete.

Checklist for Re-submittal

Order No.

6000000 _____

Checkprint #

N/A
Noted
Done

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Route plans and/or storm calculations as required. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Work order number on plans (Generally assigned after 1st Check print has been received) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Itemized estimate paid (Remainder of funds for services performed by the City of Tacoma) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | All items marked on the last check print have been addressed. (For items that have not been addressed restate comment and add, "as stated on the (1st) check print.") |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Briefly glance through plans and look for any added items to the design. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Briefly look for anything (blatant or obvious) that may have been missed on the last check print. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Look for potential problems that may have resulted from a design change due to comments listed on the last check print. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify all details sent back with the last check print have been added to the plans. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Check with Environmental Services, Science & Engineering for compliance with private drainage requirements. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify required easements have been recorded. |

PROCEDURE FOR RERTURNING REDLINES TO ENGINEER/OWNER

1. Photocopy full set of redlined check prints
2. Fill out Letter of Transmittal (include number of check print)
3. Copy of Letter of Transmittal to File
4. Copy of Letter of Transmittal to Owner/Architect
5. Update Work order status list (in file folder)
6. Update Work order list
7. Call contact person/Engineer (arrange for pickup/mail delivery)

Appendix C

City of Tacoma Public Works
Misc. Written Policies Pertaining to
Work Order / Construction

CITY OF TACOMA

INTER-DEPARTMENTAL COMMUNICATION

PUBLIC WORKS DEPARTMENT DIRECTIVE

PWD 90-1
February 9, 1990

TO: All Public Works Personnel

SUBJECT: Policy for Location of Fences and Walls
in City Right-of-way

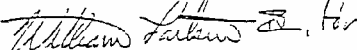
The construction of fences or walls in the public right-of-way shall meet the following requirements:

1. Where sidewalks are existing or where the future sidewalk alignment can be established, walls or fences shall be constructed a minimum of two feet behind the existing or future sidewalk (property side), unless approved in writing by the Engineering Division (591-5500).
2. When a fence or wall is to be constructed within public right-of-way and said fence or wall might create a sight distance hazard for an adjacent driveway, alley or street intersection, the location of the fence or wall shall be approved in writing by the Traffic Engineering Division (591-5262).
3. The area between the back of the sidewalk and a wall or fence shall be finished in a manner that does not create a hazard to pedestrians. Permissible materials include sod, asphalt, brick or cement concrete. Crushed or washed rock, or beauty bark is discouraged.

The construction of any improvements within public right-of-way is at the risk of the property owner. Said improvements may be ordered removed by the City at any time at the property owner's expense.

Questions regarding this policy should be directed to the Engineering Division at 591-5500.

PUBLIC WORKS DEPARTMENT


FRED A. THOMPSON, P.E.
DIRECTOR

01270

Appendix D

City of Tacoma Public Works

Uniform Building Code, Amendments re: Erosion Control

The following section is an excerpt from the City of Tacoma Amendments to the International Building Code relating to grading, excavation, and erosion control.

2.02.330 CHAPTER 33—EXCAVATION AND GRADING.

(PROVIDE LINK TO Section 2.02.330 of the Tacoma Municipal Code)

Appendix E

City of Tacoma Public Works Driveway Control Ordinance

Provide link to Tacoma Municipal Code, Chapter 10.14

Appendix F

City of Tacoma Public Works

Bond Estimate Worksheet

Bond Estimate Worksheet

Work Order Number 6000000

Buildings File Number _____

The following is a worksheet designed for use in preparing an estimate for a performance bond to submit to the City of Tacoma Public Works Department for review. Please note that not all items contained in this worksheet will apply to every project, likewise your project may contain items not shown on this worksheet. Please modify the worksheet to include only those items applicable to this project.

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
1. 1-07.15(1)	Spill Prevention, Control, and Countermeasures (SPCC) Plan, per lump sum	Lump Sum	Lump Sum	\$ _____
2. 1-09.7	Mobilization, per lump sum	Lump Sum	Lump Sum	\$ _____
3. 1-10	Traffic Control Labor, per hour	Hours	\$ _____	\$ _____
4. 1-10	Temporary Traffic Control Devices, per lump sum	Lump Sum	Lump Sum	\$ _____
5. 1-10	Uniformed Police Officer for Traffic Control, per hour	Hours	\$ _____	\$ _____
6. 2-01	Clearing and Grubbing, per lump sum	Lump Sum	Lump Sum	\$ _____
7. 2-03	Roadway Excavation, Incl. Haul, per cubic yard	Cu. Yd.	\$ _____	\$ _____
8. 2-03	Unsuitable Foundation Excavation, Incl. Haul, per cubic yard	Cu. Yd.	\$ _____	\$ _____
9. 2-03	Gravel Borrow, Incl. Haul, per cubic yard	Cu. Yd.	\$ _____	\$ _____
10. 2-03	Embankment Compaction, per cubic yard	Cu. Yd.	\$ _____	\$ _____
11. 2-09	Structure Excavation Class B, per cubic yard	Cu. Yd.	\$ _____	\$ _____
12. 2-09	Shoring or Extra Excavation Class B, per square foot	Sq. Ft.	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
13. 2-13	Remove Tree, Class #, per each	Each	\$ _____	\$ _____
14. 2-13	Remove Stump, Class #, per each	Each	\$ _____	\$ _____
15. 2-13	Stump Grinding, Class #, per each	Each	\$ _____	\$ _____
16. 2-13	Remove Shrub, per each	Each	\$ _____	\$ _____
17. 2-13	Remove Brush, per square yard	Sq. Yd.	\$ _____	\$ _____
18. 2-14	Remove Existing Pavement, Type #, Class #, per square yard	Sq. Yd.	\$ _____	\$ _____
19. 2-15	Remove Integral Curb, per linear foot	Lin. Ft.	\$ _____	\$ _____
20. 2-15	Remove Curb, per linear foot	Lin. Ft.	\$ _____	\$ _____
21. 2-15	Remove Extruded/Precast Curb, per linear foot	Lin. Ft.	\$ _____	\$ _____
22. 2-15	Remove Curb and Gutter, per linear foot	Lin. Ft.	\$ _____	\$ _____
23. 2-16	Remove Catch Basin, per each	Each	\$ _____	\$ _____
24. 2-16	Remove Manhole, per each	Each	\$ _____	\$ _____
25. 2-16	Remove Curb Inlet, per each	Each	\$ _____	\$ _____
26. 4-04	Crushed Surfacing Base Course, per ton	Ton	\$ _____	\$ _____
27. 4-04	Crushed Surfacing Top Course, per ton	Ton	\$ _____	\$ _____
28. 4-06	Asphalt Treated Base, per ton	Ton	\$ _____	\$ _____
29. 5-04	HMA Cl. ½" PG 58-22, per ton	Ton	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
30. 5-04	HMA for Approach Cl. ½" PG 58-22, per square yard	Sq. Yd.	\$ _____	\$ _____
31. 5-04	HMA for Pavement Patch Cl. ½" PG 58- 22, per ton	Ton	\$ _____	\$ _____
32. 5-04	Cold Plant Mix for Temporary Pavement Patch, per ton	Ton	\$ _____	\$ _____
33. 5-05	Cement Conc. Pavement, # -Ft. Section, per square yard	Sq. Yd.	\$ _____	\$ _____
34. 5-05	Epoxy-Coated Tie Bar with Drill Hole, per each	Each	\$ _____	\$ _____
35. 5-05	Cement Conc. Base Pavement, Cl. #, # - Ft. Section, per square yard	Sq. Yd.	\$ _____	\$ _____
36. 5-05	Cement Conc. Pavement for Pavement Patch, Cl. #, # -Ft. Section, per square yard	Sq. Yd.	\$ _____	\$ _____
37. 7-05	Manhole # -Inch Dia., Type #, per each	Each	\$ _____	\$ _____
38. 7-05	Manhole, Additional Height # -Inch Dia., Type #, per linear foot	Lin. Ft.	\$ _____	\$ _____
39. 7-05	Manhole # -Inch Diam., Type #, with Cast-in-Place Base, per each	Each	\$ _____	\$ _____
40. 7-05	Catch Basin Type I, per each	Each	\$ _____	\$ _____
41. 7-05	Catch Basin Type 2, # -In. Diam., per each	Each	\$ _____	\$ _____
42. 7-05	Catch Basin Type 2 Additional Height, # -In. Diam., per linear foot	Lin. Ft.	\$ _____	\$ _____
43. 7-05	Connect New Sewer Pipe # - In. Diam. to Existing Structure, per each	Each	\$ _____	\$ _____
44. 7-05	Reconnect Existing Sewer Pipe # - In. Diam. to New Structure, per each	Each	\$ _____	\$ _____
45. 7-05	Adjust Manhole, per each	Each	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
46. 7-05	Adjust Catch Basin, per each	Each	\$ _____	\$ _____
47. 7-05	Adjust Existing Catch Basin, Furnish New Frame and Grate, per each	Each	\$ _____	\$ _____
48. 7-05	Adjust Existing Manhole, Furnish New Frame and Cover, per each	Each	\$ _____	\$ _____
49. 7-05	Adjust Existing Valve Chamber to Grade, per each	Each	\$ _____	\$ _____
50. 7-05	Abandon Existing Manhole, per each	Each	\$ _____	\$ _____
51. 7-08	Plugging Existing Pipe, per each	Each	\$ _____	\$ _____
52. 7-08	Commercial Concrete, per cubic yard	Cu. Yd.	\$ _____	\$ _____
53. 7-17	PVC Sanitary Sewer Pipe ## -In. Diam., per linear foot	Lin. Ft.	\$ _____	\$ _____
54. 7-17	PVC Storm Sewer Pipe ## -In. Diam., per linear foot	Lin. Ft.	\$ _____	\$ _____
55. 7-17	Removal and Replacement of Unsuitable Backfill Material, per cubic yard	Cu. Yd.	\$ _____	\$ _____
56. 7-17	Testing Sewer Pipe, per linear foot	Lin. Ft.	\$ _____	\$ _____
57. 7-19	Sewer Cleanout, per each	Each	\$ _____	\$ _____
58. 8-01	Silt Fence, per linear foot	Lin. Ft.	\$ _____	\$ _____
59. 8-01	Temporary Water Pollution/Erosion Control, per linear foot	Force Account	Estimated	\$ ### ,000.00
60. 8-02	Topsoil Type # , per cubic yard	Cu. Yd.	\$ _____	\$ _____
61. 8-02	Plant Selection #### , per each	Each	\$ _____	\$ _____
62. 8-04	Cement Conc. Traffic Curb and Gutter, per linear foot	Lin. Ft.	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
63. 8-04	Cement Conc. Traffic Curb, per linear foot	Lin. Ft.	\$ _____	\$ _____
64. 8-06	Cement Conc. Driveway Entrance Type #, per square yard	Sq. Yd.	\$ _____	\$ _____
65. 8-09	Raised Pavement Marker Type 1W, per each	Each	\$ _____	\$ _____
66. 8-09	Raised Pavement Marker Type 1Y, per each	Each	\$ _____	\$ _____
67. 8-09	Raised Pavement Marker Type 2W, per each	Each	\$ _____	\$ _____
68. 8-09	Raised Pavement Marker Type 2YY, per each	Each	\$ _____	\$ _____
69. 8-12	Chain Link Fence, Type #, per linear foot	Lin. Ft.	\$ _____	\$ _____
70. 8-12	End, Corner, and Pull Post for Chain Link Fence, per each	Each	\$ _____	\$ _____
71. 8-13	Poured Monument, per each	Each	\$ _____	\$ _____
72. 8-14	Cement Conc. Sidewalk, per square yard	Sq. Yd.	\$ _____	\$ _____
73. 8-14	Cement Conc. Sidewalk Ramp Type #, per each	Each	\$ _____	\$ _____
74. 8-18	Mailbox Support, Type #, per each	Each	\$ _____	\$ _____
75. 8-22	Paint Line, per linear foot	Lin. Ft.	\$ _____	\$ _____
76. 8-22	Painted Wide Line, per linear foot	Lin. Ft.	\$ _____	\$ _____
77. 8-22	Painted Skip Wide Line, per linear foot	Lin. Ft.	\$ _____	\$ _____
78. 8-22	Plastic Crosswalk Line, per linear foot	Lin. Ft.	\$ _____	\$ _____
79. 8-22	Painted Bike Lane Symbol, per each	Each	\$ _____	\$ _____

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	PRICE	AMOUNT
80. 8-22	Plastic Bike Lane Symbol, per each	Each	\$ _____	\$ _____
81. 8-22	Removing Paint Line, per linear foot	Lin. Ft.	\$ _____	\$ _____
82. 8-23	Temporary Pavement Marking, per linear foot	Lin. Ft.	\$ _____	\$ _____
83. 8-23	Removing Temporary Pavement Marking, per linear foot	Lin. Ft.	\$ _____	\$ _____
84. 8-30	Cement Conc. Stairway, per linear foot	Lin. Ft.	\$ _____	\$ _____
85. 8-30	#### Hand Rail, per linear foot	Lin. Ft.	\$ _____	\$ _____
	Base Bid (Subtotal Items Nos. 1-###)			\$ _____
	##% Sales Tax (Items Nos. 1-###)			\$ _____
86. 1-09.6	Force Account		Estimated	\$ ##,000.00
	GRAND TOTAL (Base Bid, Sales Tax, and Force Account)			\$ _____

Appendix G

City of Tacoma Public Works

References

This Design Manual is intended to be utilized in concert with the following documents:

General References

- ◆ *Tacoma City Charter*
- ◆ *City of Tacoma Municipal Code*
- ◆ *City of Tacoma Comprehensive Plan and adopted Neighborhood Plans*
- ◆ *City of Tacoma Transportation Plan*
- ◆ *City of Tacoma Six-Year Transportation Improvement Program*

Design and Construction References

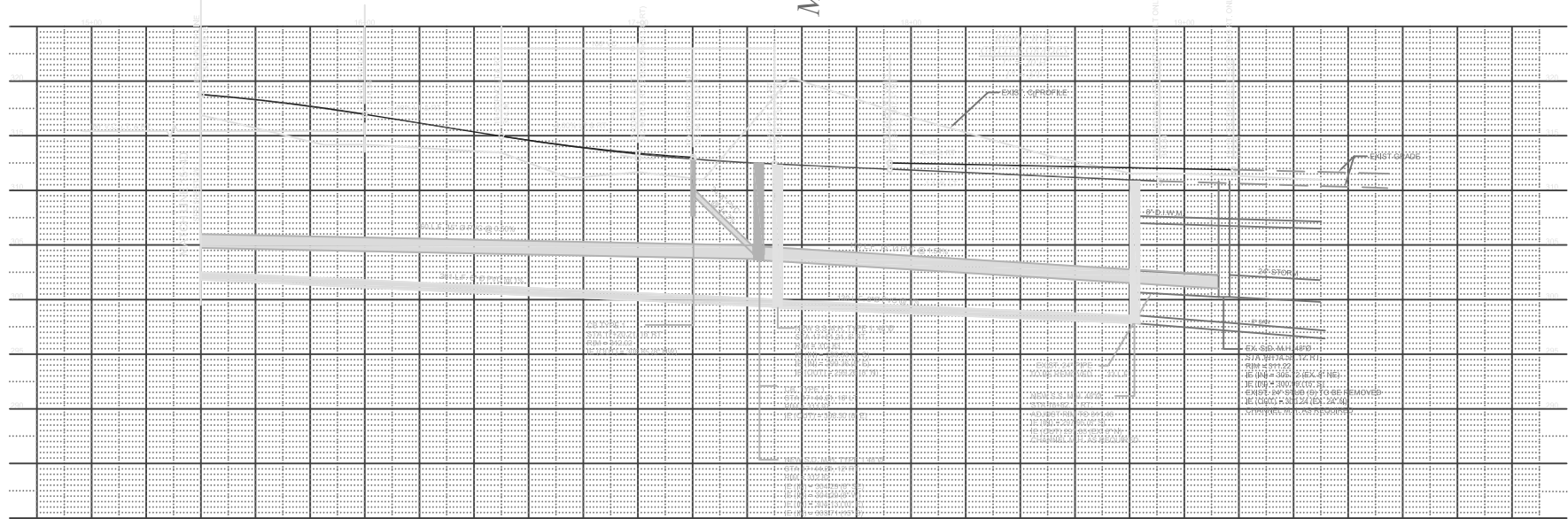
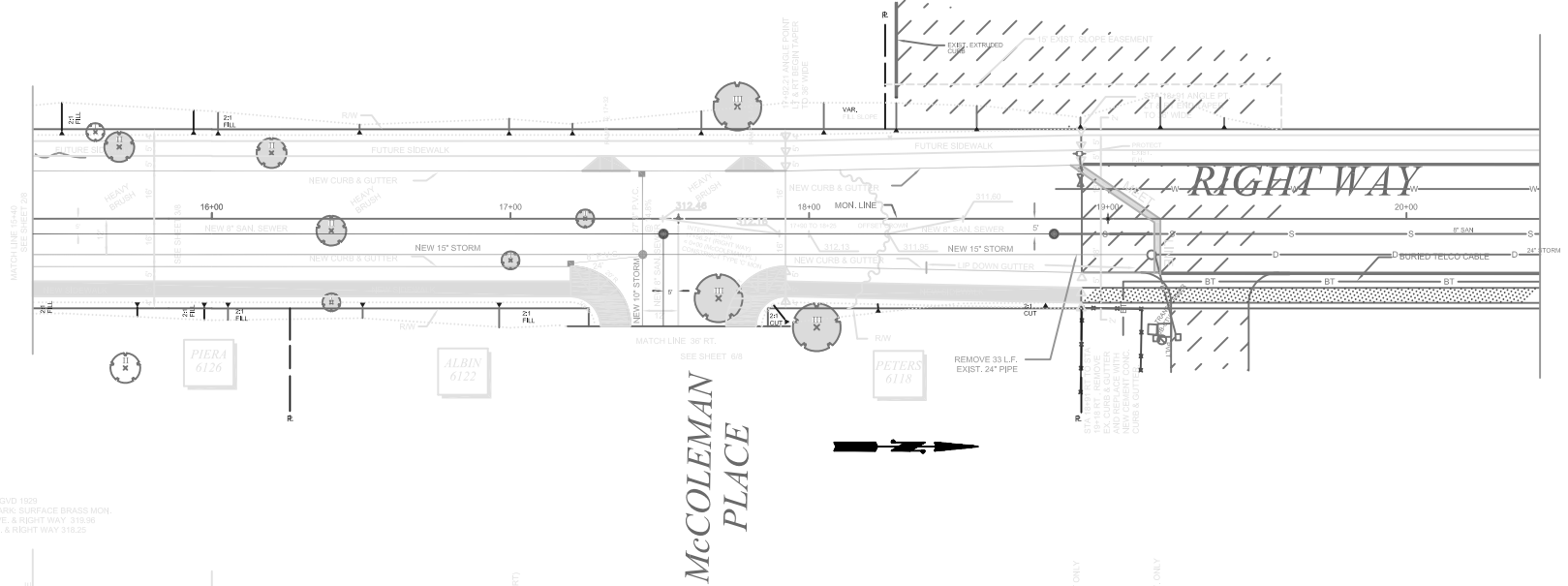
- ◆ *WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction*
- ◆ *City of Tacoma Amendments to the WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction*
- ◆ *WSDOT/APWA Standard Plans*
- ◆ *WSDOT Design Manual*
- ◆ *WSDOT Traffic Manual*
- ◆ *WSDOT Construction Manual*
- ◆ *A Policy on Geometric Design of Highways and Streets - AASHTO*
- ◆ *Standard Specifications for Highway Bridges - AASHTO*
- ◆ *City and County Design Standards - WSDOT*
- ◆ *Local Agency Guidelines - WSDOT*
- ◆ *Trip Generation, 5th Edition, ITE - Institute of Transportation Engineers*
- ◆ *Trip Generation, February 1995 Update to the 5th Edition, ITE - Institute of Transportation Engineers*
- ◆ *Parking Generation, 2nd Edition, ITE - Institute of Transportation Engineers*
- ◆ *City of Tacoma Stormwater Management Manual*
- ◆ *MUTCD – Manual on Uniform Traffic Control Devices*
- ◆ *IES – Illuminating Engineering Society, RP-8, Recommended Progress for Roadway Lighting.*
- ◆ *Federal Register, American with Disabilities Act (ADA)*

Appendix H

City of Tacoma Public Works Work Order Sample Plan



DATUM: NGVD 1929
BENCH MARK: SURFACE BRASS MON
ARSON AVE. & RIGHT WAY 319.98
STARR ST. & RIGHT WAY 316.25



SAMPLE PLAN

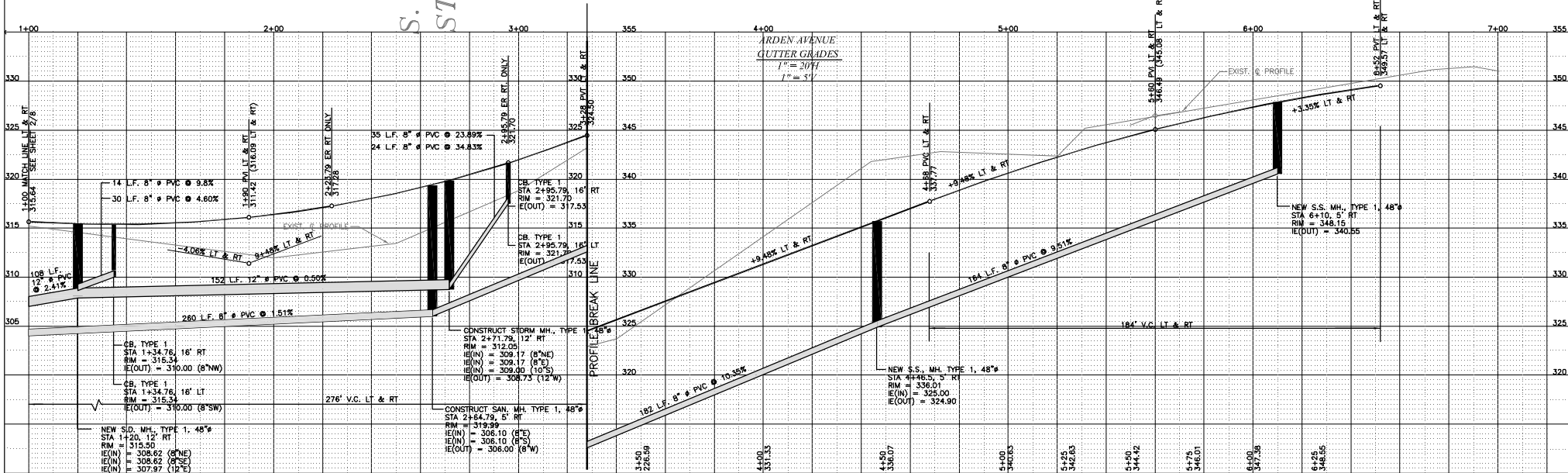
CITY OF TACOMA, PUBLIC WORKS DEPT.
CONSTRUCTION DIVISION
747 MARKET STREET, ROOM 620
TACOMA, WASHINGTON 98402
(253)591-5760 FAX: (253)594-7966



NO.	REVISION	DATE	APP.	FILE	NO.	DATE	FILE	NO.	DATE	FILE

STAMP
SIGNATURE
& DATE

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS RIGHT WAY 15+40 TO 19+18 STREET, STORM AND SANITARY IMPROVEMENTS	6000000#### SHEET NO. PAGE 3 OF 9
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CONSTRUCTION DIVISION
747 MARKET STREET, ROOM 620
TACOMA, WASHINGTON 98402
(253)591-5760 FAX: (253)594-7966



BY DATE	FINAL CONSTRUCTION CHECKED	DATE 04/30/04	SCALE 1"=20'
	FIELD BOOKS	DESIGNED E.L.S.	CHECKED D.S.H.
		DRAWN R LOTH	DRAWING NAME BURNS-4

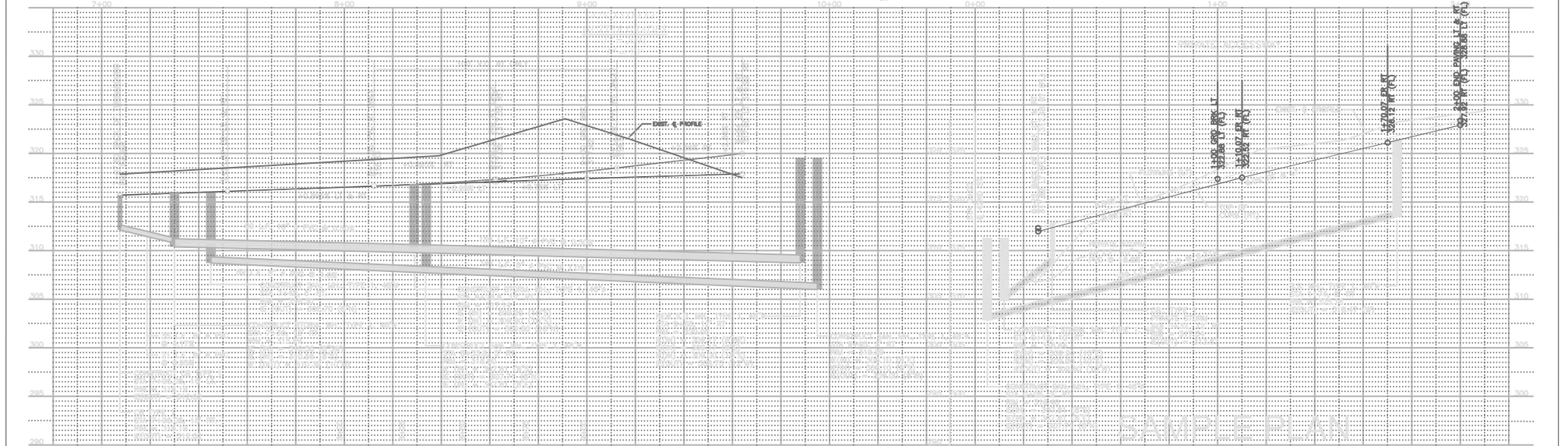
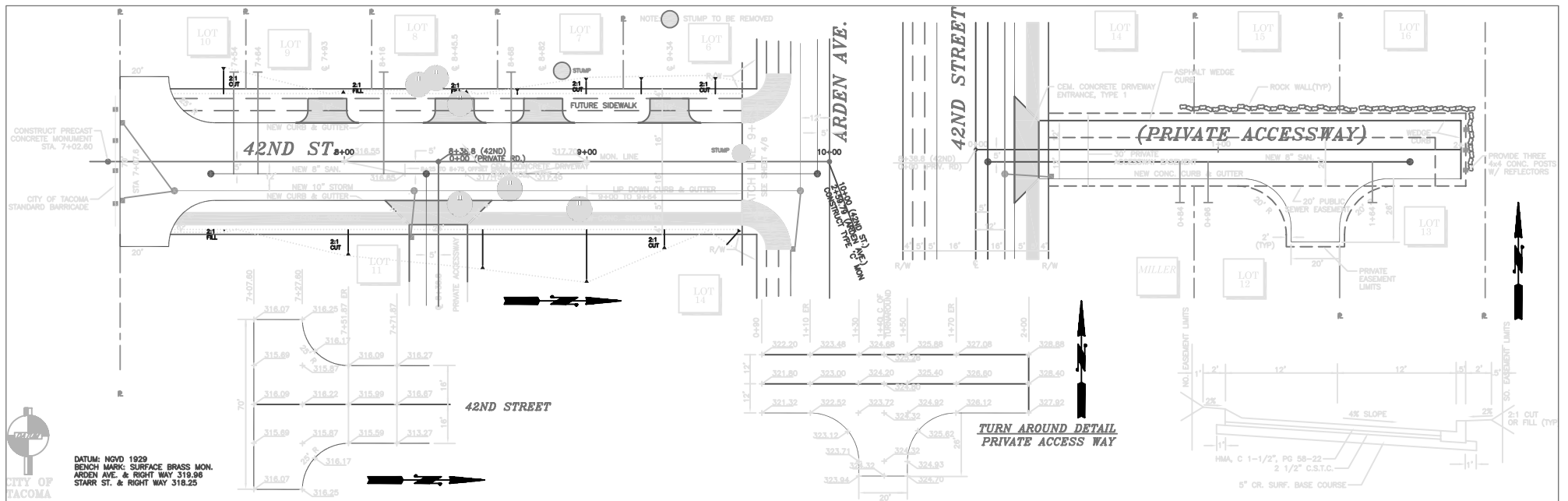
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CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

**ARDEN AVENUE
STREET, STORM AND
SANITARY IMPROVEMENTS**

6000000#####

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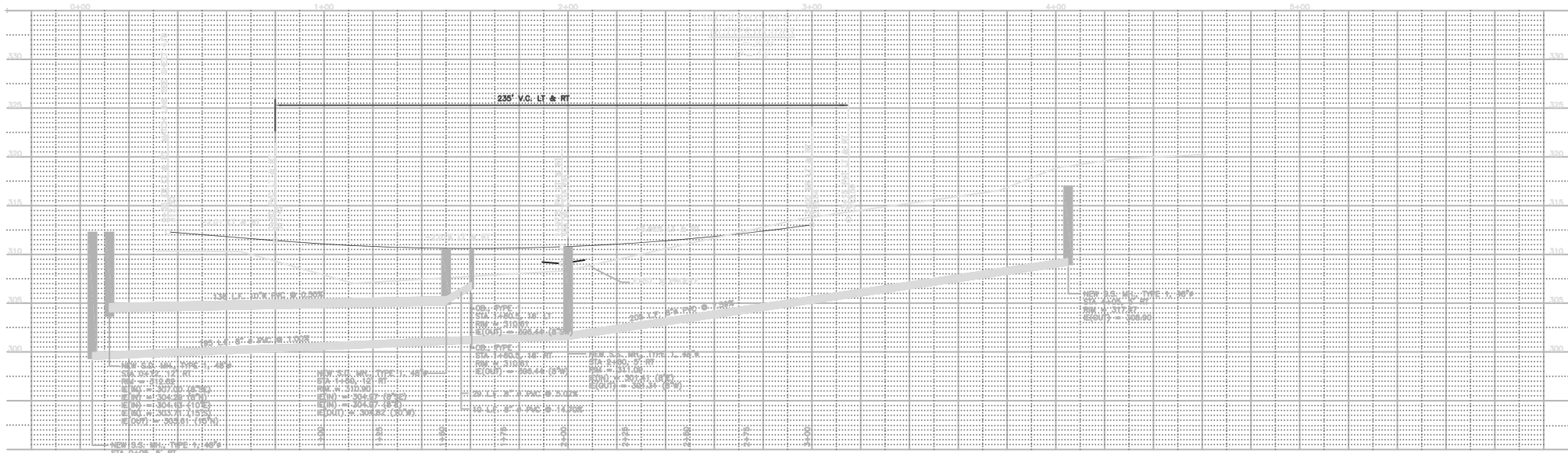
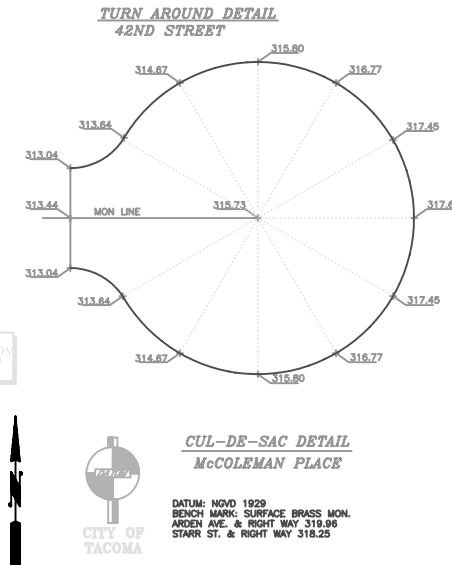
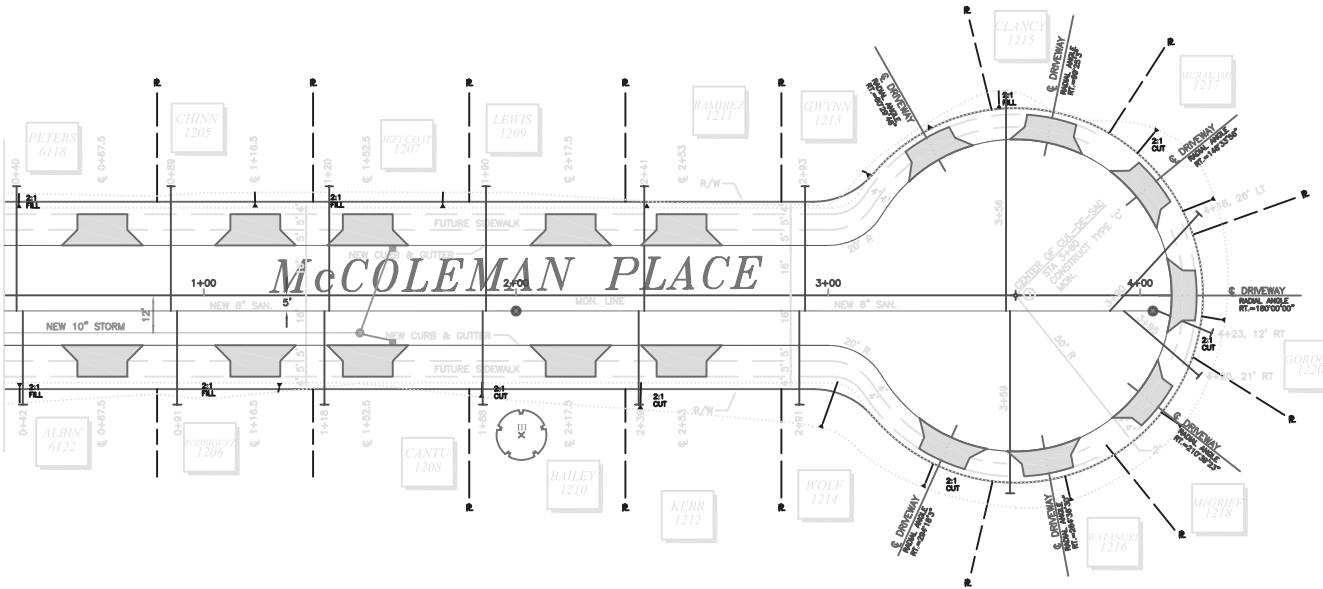


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NO	REVISION	DATE	APPROVED	PROJECT ENGINEER	DATE	DESIGNED	CHECKED	SCALE	STAMP, SIGNATURE & DATE	CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS 42ND ST. & PRIVATE ACCESSWAY STREET, STORM AND SANITARY CONSTRUCTION	SHEET NO. 60000000####	PAGE 5 OF 9
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SEE SHEET 3/9
MATCH LINE 0+36



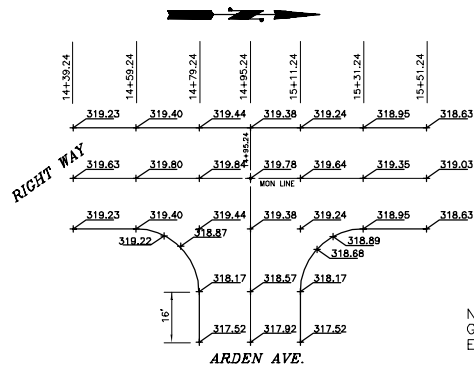
SAMPLE PLAN

CITY OF TACOMA, PUBLIC WORKS DEPT.,
CONSTRUCTION DIVISION
747 MARKET STREET, ROOM 620
TACOMA, WASHINGTON 98402
(253)591-5760 FAX: (253)594-7966

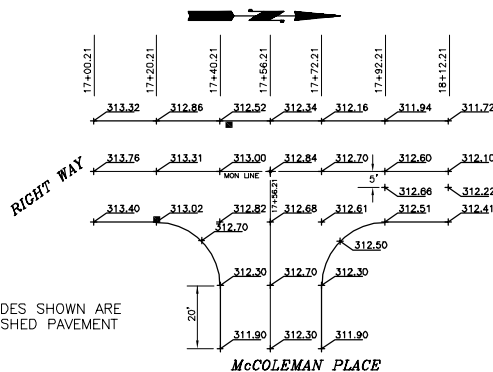


NO.	REVISION	DATE	APPD.	FILED	DATE	SCALE	1"=30'	DESIGNED	E.L.S.	DRAWN	D.S.H.	CHECKED	BURNS-5	STAMP, SIGNATURE & DATE

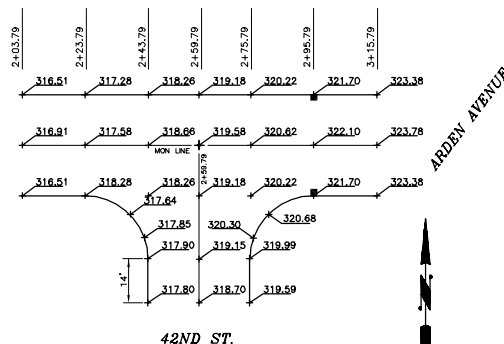
CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS McCOLEMAN PLACE STREET, STORM AND SANITARY IMPROVEMENTS	6000000#### SHEET NO.	PAGE 6 OF 9
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INTERSECTION DETAIL
RIGHT WAY & ARDEN AVENUE

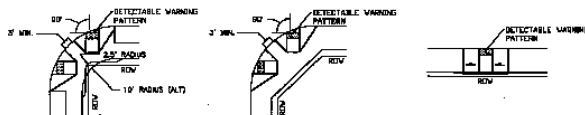


INTERSECTION DETAIL
RIGHT WAY & MCCOLEMAN PLACE



INTERSECTION DETAIL
ARDEN AVENUE & 42ND ST.

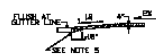
NOTE: GRADES SHOWN ARE
GUTTER/FINISHED PAVEMENT
ELEVATIONS.



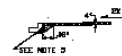
SIDEWALK WITH PLANTING STRIP

COMBINATION SIDEWALK

SIDEWALK RAMP-TYPE 2



CROSS SECTION
OF SIDEWALK RAMP



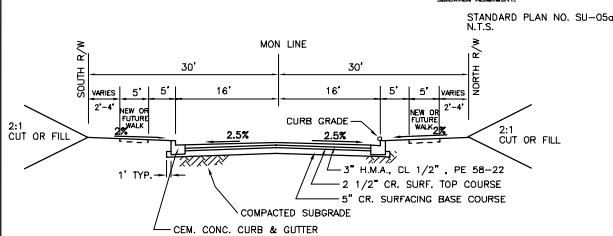
CROSS SECTION
WITH RADIUS OF CURB



TYPICAL SECTION
OF SIDEWALK RAMP-TYPE 2

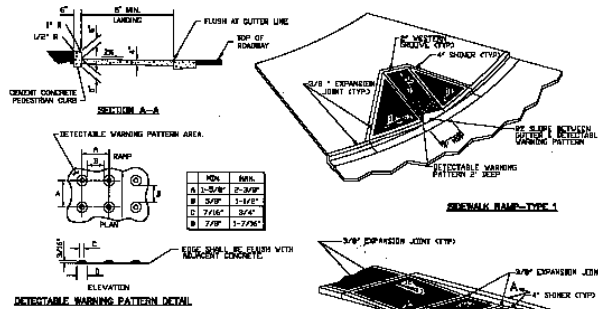
- NOTES:**
1. A MINIMUM 16' WIDE ACCESSIBLE ROUTE SHALL BE MAINTAINED IN ALL PEDESTRIAN ACCESSIBLE AREAS.
 2. THE RAMP CENTERLINE SHALL BE PARALLEL TO THE DIRECTION OF THE CROSSING.
 3. LANDING SHALL BE A MINIMUM OF 6' W/ DOPH.
 4. THICKNESS SHALL BE CONSTRUCTED TO FULL DEPTH OF ADJACENT CURB ALONG THE ENTIRE WIDTH OF CURB.
 5. FOR DETECTABLE WARNING PATTERNS DETAILS REFER TO STANDARD PLAN NO. SU-054.

- GENERAL NOTES:**
1. PEDESTRIAN TRAFFIC SHALL NOT BE DIRECTED INTO CROSSING TRAFFIC.
 2. PEDESTRIAN TRAFFIC SHALL BE DIRECTED IN FRONT OF THE STOP BAR.
 3. PEDESTRIAN TRAFFIC SHALL NOT BE DIRECTED BEHIND MARKED CROSSWALK.
 4. PEDESTRIAN TRAFFIC SHOULD BE ALIGNED TO OPPOSITE RAMP.
 5. RAMP ALIGNMENT SHOULD BE CONSTANT WITH SIDEWALK ALIGNMENT.



TYPICAL ROADWAY SECTION
N.T.S.

RIGHT WAY STA. 14+50 - 18+91
ARDEN AVENUE
MCCOLEMAN PLACE
42ND STREET



- NOTES:**
1. THE DETECTABLE WARNING PATTERNS SHALL BE YELLOW-TILE TACTILE SYSTEM MARKING PATTERNS BY MANUFACTURED PLASTIC OR ON EPDM CONCRETE SHALL BE SELECTED BUT AS REQUIRED FOR THE INSTALLATION OF THE DETECTABLE WARNING PATTERNS PATTERNS.
 2. THE DETECTABLE WARNING PATTERNS AREA SHALL BE YELLOW AND SHALL MATCH THE COLOR OF STANDARD INTERSTATE YELLOW PAINT AS SPECIFIED IN FORMULA M-8-83.

STANDARD PLAN NO. SU-054
N.T.S.

Embankment Specifications

1. The contractor shall construct embankments with material meeting the requirements of Section 9-03.14 "Gravel Borrow".
- The contractor shall be responsible for hiring an independent certified lab, for quality control of all fill areas.

Fill areas shall be constructed meeting the requirements of Section 2-03.3(14)C "Compacting Earth Embankment; Method C".

GENERAL NOTES

1. Sidewalk denoted as future walk to be constructed at the Building Permit stage.
2. All shaded sidewalk & driveways to be constructed as a part of this work order.
3. All sanitary & storm pipes shall be SDR 35 PVC conforming to ASTM D3034 unless otherwise noted.

SPECIAL TRAFFIC CONTROL REQUIREMENTS

LOCATION: Right Way and Arden Ave. (6000000####)

The following special traffic controls shall supplement Section 1-07.23 of the Standard Specifications as amended by the City of Tacoma.

The contractor may close non-arterial streets to through traffic, provided that local access is maintained at all times with a minimum of a 20 foot wide access lane. The contractor shall coordinate any closures and cooperate with the various businesses and/or residences adjacent to the project site. A minimum of one access shall be maintained to all properties at all times.

Three (3) working days prior to any street closure, the contractor shall notify:

Tacoma Traffic Engineering (591-5500)
Tacoma Fire Dept. (591-5733)
Tacoma Police Dept. (591-5950)
LESA Communications Center (798-4721-Opt. #1)
School Transportation Office (571-1853)
Pierce Transit (581-8019)
Tacoma Solid Waste (591-5544)
Tacoma Streets & Grounds (591-5495)

SAMPLE PLAN

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CONSTRUCTION DIVISION
747 MARKET STREET, ROOM 620
TACOMA, WASHINGTON 98402
(253)591-5760 FAX: (253)594-7966



NO.	REVISION	DATE	APP.

STAMP
SIGNATURE
& DATE

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS	6000000####
INTERSECTION DETAIL STREET, STORM AND SANITARY IMPROVEMENTS	SHEET NO.
ASSISTANT CONSTRUCTION DIVISION MANAGER	PAGE 7 OF 9

PRIVATE WORK ORDER GENERAL NOTES

GENERAL

- The following special provisions are to be used in conjunction with the "2004 Standard Specifications for Road, Bridge and Municipal Construction" and "Standard Plans for Road, Bridge and Municipal Construction" as prepared by the Washington State Department of Transportation (WSDOT) and as supplemented by the Washington State Chapter of American Public Works Association (APWA). State Standard Specifications are available through WSDOT, by mail at Pre-Contract Section, P.O. Box 47408, Olympia, WA 98504-7408, or by telephoning (360) 705-7430.
- Any inconsistency between these work order drawings and the 2004 Standard Specifications or the WSDOT Standard Plans shall be resolved by the following order of precedence (e.g., 1 prevailing over 2, 3, and so forth):
 1. Approved Work Order Drawings
 2. 2004 Standard Specifications
 3. WSDOT Standard Plans.
- Any revisions to these plans must be reviewed and approved by the City of Tacoma Department of Public Works prior to any implementation in the field.
- Contractors shall familiarize themselves with the site and shall bring any discrepancies to the attention of the Engineer prior to undertaking the affected work.
- Any discrepancy in these drawings, specifications, these notes, and the site conditions shall be reported to the Engineer, who shall correct such discrepancy in writing after reviewing any changes. Any work done by the Contractor after the discovery of such discrepancy shall be done at the Contractor's risk. The Contractor shall verify and coordinate the dimensions among all drawings prior to proceeding with any work.

ADDITIONAL PERMITS

- Separate permits are required for all retaining walls, grading, and erosion control. Adherence to all conditions of these permits is required as a part of this plan.
- Separate permits are required for sidewalk installation as well as curb and gutter removal and driveway construction when constructed at building permit stage.
- Separate storm and sanitary sewer connection permits are required for connections to the sanitary or storm sewer system.

UTILITIES

- The existing underground utilities shown hereon are based upon existing record drawings and are not guaranteed to be accurate, nor all-inclusive.
- All utilities must be verified prior to construction. If the project requires any excavation, the developer/contractor is required to call the Utility Underground Location Center at (800) 424-5555 at least two days before starting such excavation in accordance with RCW 19.122.
- It shall be the Contractor's responsibility to protect, in place, all utilities and/or structures whether shown or not shown on this plan. Damage due to the Contractor's operations shall be repaired at the Contractor's expense.

EXCAVATION

- If workers enter any trench or other excavation four feet or more in depth that does not meet the open pit requirements of Section 2-09.3(3)(b), it shall be shored and cribbed. All trench safety systems shall meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor alone shall be responsible for all worker safety, and neither the City of Tacoma nor the Engineer of record assumes any responsibility.

PAVEMENT PREPARATION

- Additional removal and replacement of pavement may be required to provide proper transition/crown as directed by the City of Tacoma Construction Inspector in the field.
- The street sections shown on this plan are designed to be placed upon a firm and unyielding base.
- Subgrade compaction shall be tested by a professional geotechnical consultant prior to placing base material.

HOT MIX ASPHALT

- The hot mix asphalt shall be HMA CL 1/2 inch PG 5822. Mix design shall be based on 3 million ESAL's.
- Section 5-04.3(8)(A) 'Acceptance Sampling and Testing' of the Standard Specifications is deleted.
- All hot mix asphalt shall be compacted to a minimum of 92 percent of the maximum density as determined by AASHTO T209. All hot mix asphalt utilized shall be considered compactable. The level of compaction attained will be determined as the average of not less than 5 nuclear density gauge tests taken on the day the mix is placed (after completion of the finish rolling) at randomly selected locations within each lot. The quantity represented by each lot will be no greater than a single day's production or approximately 400 tons, whichever is less.
- All test results shall be provided to the City within 48 hours of the test.
- Control lots not meeting the minimum density standard shall be removed and replaced with satisfactory material.
- In addition to the randomly selected locations for test of the control lot, the Engineer reserves the right to test any area which appears defective and to require further compaction of areas that fall below acceptable density readings. These additional tests shall not impact the compaction evaluation of the entire control lot.
- Hot mix asphalt pavement shall not be placed on any traveled way between October 1 and April 1 without written approval from the Construction Division Manager.
- No traffic shall be allowed on any newly placed pavement until the approval of the Inspector.

CONCRETE

- Cold Weather Concrete Work. The following requirements for placing concrete shall be in effect from November 1 to April 1:
 1. The Engineer shall be notified at least 24 hours prior to any concrete placement.
 2. Weather permitting, all concrete placement shall be completed no later than 2:00 p.m. each day.
 3. Where forms have been placed and the subgrade has been subjected to severe frost, no concrete shall be placed until the ground is completely thawed. At that time, the forms shall be adjusted and subgrade repaired as determined by the Engineer.
- Curing of concrete shall be in accordance with Section 5-05.3(13) of the Standard Specifications.
- The slump for concrete used for sidewalks shall not exceed four inches +/- one inch.
- The curb ramps shown on the plan are conceptual only. The Contractor shall contact the Construction Inspector for approval of curb ramps prior to placing.

SANITARY AND STORM SEWERS

- Section 7-04 of the Standard Specification is deleted. Storm sewers shall meet all the requirements of sanitary sewers.
- Sewers and appurtenances shall be cleaned and tested after backfilling by either infiltration or low-pressure air method at the option of the Contractor, except where the ground water table is such that the Engineer may require the infiltration test.
- All sanitary and storm sewers shall be video inspected by City Forces prior to paving where paving occurs over sewers. All other sewers will be video inspected prior to final acceptance.
- All abandoned pipes encountered during construction and new storm and sanitary sewer stub outs shall be sealed with a watertight pipe plug.
- All frames and grates for standard catch basin inlets on this project shall be "vaned" type and shall conform to that shown on WSDOT Standard Plan No. B-2b.

MISCELLANEOUS

- Any fence or structure replaced and/or relocated shall be maintained to remain functional.
- Independent quality assurance sampling and testing will be provided by a professional geotechnical consultant for all improvements within the right-of-way.
- All daily reports shall be forwarded to the Construction Division Office on a monthly basis.
- The Contractor shall only use those hydrants designated by the agency in charge of water distribution and in strict accordance with its requirements for hydrant use. Water applied by the Contractor shall not be from residential sources.

GRADING, EXCAVATION, AND EROSION CONTROL NOTES

- All work is to be done in accordance with the approved plan, soils report, and Appendix Chapter 33 of the 1997 Uniform Building Code and the City of Tacoma 2003 Stormwater Management Manual.
- When construction operations are such that debris from the work is deposited on the streets, the Contractor shall, as a minimum, remove on a daily basis any deposits or debris which may accumulate on the roadway surface. Should daily removal be insufficient to keep the streets clean, the Contractor shall perform regular operations on a more frequent basis. If the City of Tacoma Construction Inspector determines that a more frequent cleaning is impractical or if the Contractor fails to keep the streets free from deposits and debris resulting from the work, the Contractor shall, upon order of the City of Tacoma Construction Inspector, provide facilities for, and remove all clay or other deposits from the tires or between wheels before trucks or other equipment will be allowed to travel over paved streets. Should the Contractor fail or refuse to clean the streets in question, or the trucks or equipment in question, the City of Tacoma Construction Inspector may order the work suspended at the Contractor's risk until compliance with the Contractor's obligations is assured, or the City of Tacoma Construction Inspector may order the streets in question cleaned by others and such costs incurred by the City in achieving compliance with these requirements, including cleaning of the streets, shall be deducted from the work order account.
- The Contractor shall protect existing drainage structures using acceptable methods and materials as shown on this plan. If the methods and materials as shown on this plan are not adequate, the City of Tacoma Construction Inspector may require additional/alternative methods for erosion control and/or protection of existing drainage structures. Additional or alternative methods shall be submitted by the design engineer and accepted by the City of Tacoma Construction Inspector. Any damage caused to the City of Tacoma storm sewer system as a result of the work outlined on this plan shall be the sole responsibility of the Contractor. Resolving solid damage may include, but not be limited to, the cleaning of the drainage system in question by the Contractor.
- Watering provisions when applicable must be in place to prevent dust from becoming air borne - violation of this condition will result in a stop work order until corrected.
- Fill that will support a street section or other structures contained in or supporting City of Tacoma right-of-way shall be placed under the inspection of a Licensed Geotechnical Engineer. Soil to be placed shall be tested and compacted to 95 percent of its maximum density. Engineer shall document existing site conditions, will control placement and allowable bearing capacity submitted. Standard requirements for cuts and fill as contained in Chapter 33 of the Uniform Building Code as amended by the City of Tacoma shall be complied with.

HYDROSEEDING

- All areas that are cleaned and grubbed, graded, excavated or filled are subject to hydroseeding. Any of these areas that are left unpaved or unlandscaped shall be hydroseeded under the direction and approval of the Construction Inspector.
- Hydroseed only during the periods of April 1 through May 31 or September 1 through October 15. This hydroseeding requirement may be met during the months of June through August if irrigation is provided.
- Maintain hydroseeding throughout the winter wet season.
- A pre-construction meeting shall be held at the City of Tacoma with the applicant, contractor, and City inspectors prior to issuance of a permit.
- A stormwater pollution prevention plan is required for all work order projects. The plan must be in accordance with the 2003 City of Tacoma Stormwater Management Manual.

EROSION CONTROL MEASURES

- A. Minimum Erosion Control measures shall include:
 1. Construction entrance.
 2. Perimeter erosion/sedimentation control.
 3. Protection of catch basins.
 4. Stabilization of exposed soils.
- B. All erosion control shall be in place prior to clearing.
- C. Erosion control measures shall be maintained at all times to the approval of the Construction Inspector.
- D. Should temporary erosion and sedimentation control measures, as shown on plans become inadequate, the contractor shall install facilities as necessary to protect adjacent properties and the City of Tacoma drainage system, meeting approval of the Construction Inspector.
- Grading, excavation, and filling prohibited. No permits to perform grading, excavation, or filling during the period from October 1st through March 31 shall be issued.
- EXCEPTION: The Building Official may approve a grading, excavation, or filling plan prepared by a licensed Civil or Geotechnical Engineer which specifically addresses the winter rain season and the associated erosion problems, and issue a permit based on such plan.
- Call for inspection of the Construction Inspector upon completion of:
 - A. Staking of clearing limits.
 - B. Installation of erosion control and prior to site grading.
 - C. Prior to removal of erosion control devices.
- All material removed from site shall be placed only at a permitted site. Verify location of destination of material prior to exportation.
- Traffic control provisions as approved by the traffic engineer shall be adhered to at all times.
- Trees to be removed shall be clearly marked for removal. Trees to be saved shall be fenced with barricade fence at the drip line (outer edge of tree branches) to keep construction vehicles from compacting root zone and killing trees. This fencing shall be maintained until construction ends.

RECORD DRAWINGS CRITERIA FOR ACCEPTANCE OF ALL PRIVATE WORK ORDERS

- All revisions to the approved plans must be approved by the City of Tacoma Public Works Construction Division prior to implementation of the changes.
- A determination at the time of proposal shall be made whether the revision can be addressed with red line drawings submitted as a part of the record drawings or will require formal submission for approval.
- Record drawings shall show the station, offset and curb elevation, to nearest 0.01 foot; for all horizontal and vertical roadway alignment changes.
- Record drawings shall show centerline and gutter profiles at beginning and ending stations and end of radius where permanent improvements are constructed.
- Record drawings shall show the station, offset, invert, and rim elevations to the nearest 0.01 foot for all storm and sanitary sewer structures. (i.e.: manholes, catch basins, etc.)
- After any new storm and/or sanitary sewer(s) have been cleaned and the manholes channels, the main(s) shall be televised to provide a record of the constructed conditions and to verify side sewer connection locations by the City of Tacoma Public Works Sewer Maintenance Division.
- The property side ends of the side sewers shall be marked in the field by means of a 2-inch by 4-inch board and locate wire that extends from the flow line of the side sewer to at least 1 foot above the finished lot grade. Record drawings shall show all side sewers and shall locate them by measurements from permanent objects. (i.e.: curb, property corner, etc.) In addition, the depth of all side sewers shall be noted on the record drawings and locate board.
- Record drawings shall be received and accepted prior to issuing side sewer connection permits or release of performance bonds.
- Record drawings shall show vertical and horizontal datum for survey monuments (existing or new construction) within the limits of the project.
- Record drawings shall consist of a clean set of approved work order drawings with all changes noted above shown in red ink.
- Record drawings must be submitted within 30 days of substantial completion or City survey crews will collect the necessary data and bill against the work order.

MONUMENT REMOVAL PERMIT PROCESS

"No survey monument shall be removed or destroyed (the physical disturbance or covering of a monument such that the survey point is no longer visible or readily accessible) before a permit is obtained from the Department of Natural Resources (DNR), MAC 332-120-030(2) states "It shall be the responsibility of <insert performing construction work or other activity (including road and street resurfacing projects) to adequately search the records and the physical area of the proposed construction work or other activity for the purpose of locating and referencing any known or existing survey monuments." Construction shall not commence until MAC outlined in Chapter 332-120 is complied with.

SEWERS AND STORM

- Clearing stakes if needed.
- Stakes every 50 feet plus grade breaks. Try to maintain 12 foot offsets in streets and 8 foot offsets in alleys.
- Double offsets at manholes and catch basins (ahead and back stakes at angle points).
- Catch basin station shall be to the centerline of the basin. Catch basin offsets shall be to the face of the curb.

RESIDENTIAL STREETS

- Clearing stakes as needed.
- Slope stakes every 50 feet and grade breaks if cuts or fills exceed 2 feet.
- Slope stakes every 50 feet and grade breaks, on 4 foot offset to the face of curb. Curb stakes are set to the top of curb grade (Blue Tops).
- Also stake the beginning and end of all approaches.
- No centerline of street grades unless the street grade is warped. If street grades are needed, set blue tops for each course.

ARTERIAL STREETS

- Clearing stakes as needed.
- Slope stakes every 50 feet and grade breaks if cuts or fills exceed 2 feet.
- Curb stakes every 50 feet and grade breaks, on 4 foot offset to the face of curb.
- Curb stakes are set to the top of curb grade (Blue Tops). Also stake the beginning and end of all approaches.
- Stake centerline and quarterline grade every 50 feet and grade breaks at grade for each course.

ALLEYS

- Stakes both sides every 50 feet and grade breaks, on a 2 foot offset to the edge of paving, with a cut of fill to edge of paving on high side and flow line on low side.

SIDEWALKS

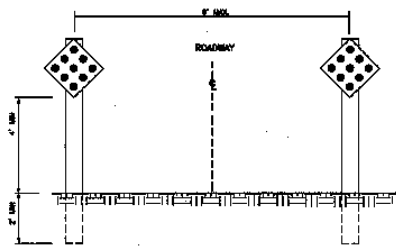
- Offsets for walks are set on 50' intervals and grade breaks normally at 2 foot to edge of walk and at edge of walk grade (Blue Tops).
- Sidewalk alignment is normally at 5 feet from the face of curb. No walk grades are needed if curbs are built.

HORIZONTAL AND VERTICAL CURVES

- Grade stakes must be set every 25 feet and grade breaks with a minimum of 3 stakes for each curve. Radius points on street curves.

SAMPLE PLAN

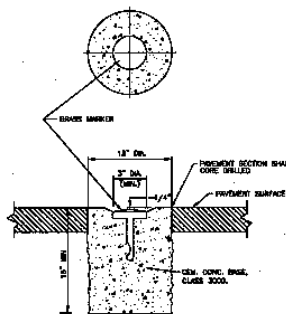
CITY OF TACOMA, PUBLIC WORKS DEPT. CONSTRUCTION DIVISION 747 MARKET STREET, ROOM 620 TACOMA, WASHINGTON 98402 (253)591-5760 FAX: (253)594-7966		NO.	REVISION	DATE	APPV.	<div>FINAL CONSTRUCTION CHECKED</div>	DATE 04/30/04	SCALE NTS	<div>STAMP SIGNATURE & DATE</div>	<div>CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS</div>	6000000####
						BY DATE	DESIGNED E.L.S.	CHECKED D.S.H.		DRAWING NAME R.L.O.T.H. BURNS-NOTES	
						FIELD BOOKS	PROJECT LOCATION				



NOTES

1. 4"x6" WOODEN POSTS SHALL BE WESTON RED CEDAR OR PRESSURE TREATED WOOD.
2. HANDRAILS FOR MOUNTING SHALL BE 12" HIGH AND 12" WIDE. THE HANDRAILS SHALL BE 12" HIGH AND 12" WIDE.
3. THE END-OF-ROAD MARKER SHALL BE ONE OF THE FOLLOWING:
A. A MARKER CONSISTING OF A RED RETROREFLECTIVE WITH A MINIMUM DIAMETER OF 3 IN. MOUNTED PERMANENTLY ON A RED DRAINAGE PANEL 18 IN. ON A SIDE (DASH-1) OR A RETROREFLECTIVE RED DRAINAGE PANEL 18 IN. ON A SIDE (DASH-2).

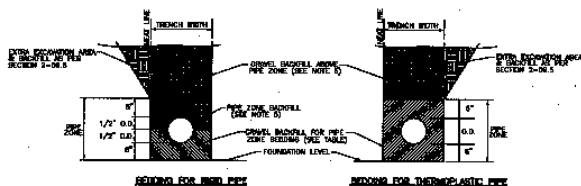
STANDARD PLAN NO. SU-13



NOTES

1. CONCRETE BASE SHALL BE POURED IN PLACE. HAVE USED CONCRETE IS PREPARED. CONCRETE BASE MUST NOT BE MOVED.
2. NOTICE TO SUBMITTER: ANY MEASUREMENT SET IN THE CITY OF TACOMA MUST BE IN THE LINE SURVEYOR'S HANDS OF THE SURVEYOR LISTING THE MEASUREMENT. MEASUREMENTS SET AS PART OF AN APPROVED PLAN ARE EXCEPT.
3. THE SURVEYOR IS TO SUPPLY THE CITY OF TACOMA WITH A COPY OF THE CALCULATIONS USED TO DETERMINE ALL MEASUREMENTS SETTING BEFORE THE MEASUREMENTS ARE SET.
4. MARKER SHOWN FOR CITY OF TACOMA. PRODUCT SHALL BE SUPPLIED BY THE CITY. ALL OTHER MARKERS MUST BE SUPPLIED BY THE CONTRACTOR.
5. MARKMENT MUST BE IMMEDIATELY LOCATABLE.

STANDARD PLAN NO. SU-01



REINFORCING FOR REINFORCING

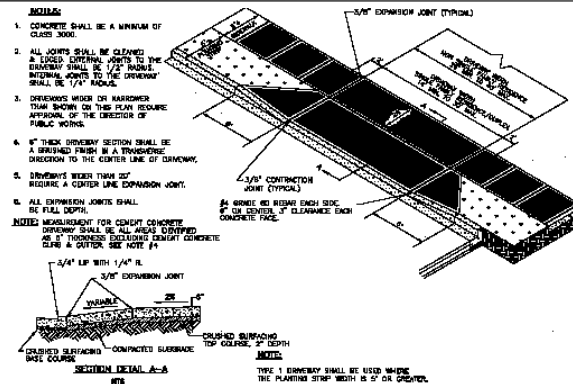
REINFORCING FOR THERMOPLASTIC PIPE

PIPE SIZE	SPACING (INCHES)
3/4" SQUARE	100
3/8" SQUARE	85-100
U.S. NUMBER 8	0-10
U.S. NUMBER 10	0-10
SAFETY EXPANSION	35 MINIMUM

NOTES

1. PROVIDE UNIFORM SUPPORT UNDER DRAIN.
2. ROAD TRAP UNDER DRAINAGE.
3. DRAINAGE TRENCH AND DRAINAGE TRENCH TO BE 12" HIGH. DRAINAGE TRENCH TO BE 12" HIGH.
4. TRENCH WIDTH SHALL BE AS SPECIFIED IN SECTION 2-08.1 OF THE STANDARD SPECIFICATIONS.
5. SEE STANDARD SECTION 2-08.1 FOR TRENCH REINFORCING FOR PIPE ZONE BACKFILL AND FOR TRENCH REINFORCING FOR PIPE ZONE BACKFILL.

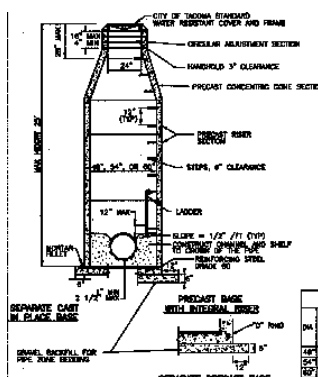
STANDARD PLAN NO. SU-16



SECTION DETAIL A-A

TYPE 1 DRIVEWAY SHALL BE USED WHERE THE PLANTING STRIP WIDTH IS 5' OR GREATER.

STANDARD PLAN NO. SU-07
CONC. DRIVEWAY ENTRANCE TYPE 1

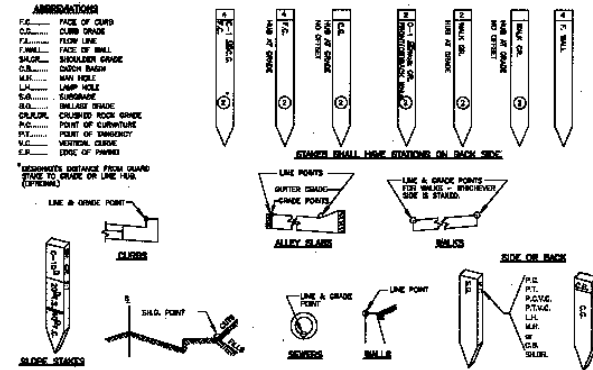


NOTES

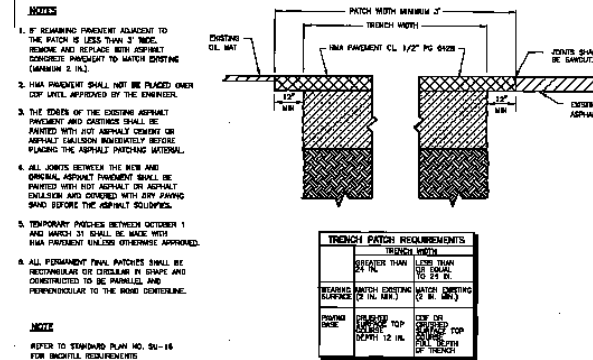
1. EXISTING 12' x 12' WOODEN POSTS OF TYPE 1 SHALL BE USED WHERE THE PLANTING STRIP WIDTH IS 5' OR GREATER.
2. FOR TYPE 1 DRIVEWAY ENTRANCE TYPE 1, THE PLANTING STRIP SHALL BE 5' OR GREATER.
3. THE PLANTING STRIP SHALL BE 5' OR GREATER.
4. THE PLANTING STRIP SHALL BE 5' OR GREATER.
5. THE PLANTING STRIP SHALL BE 5' OR GREATER.

MANHOLE DIMENSION TABLE					
MANHOLE SIZE	MINIMUM SPACING BETWEEN MANHOLES	MINIMUM SPACING BETWEEN MANHOLES	MINIMUM SPACING BETWEEN MANHOLES	MINIMUM SPACING BETWEEN MANHOLES	MINIMUM SPACING BETWEEN MANHOLES
12" x 12"	4'	4'	4'	4'	4'
18" x 18"	4'	4'	4'	4'	4'
24" x 24"	4'	4'	4'	4'	4'
30" x 30"	4'	4'	4'	4'	4'
36" x 36"	4'	4'	4'	4'	4'

STANDARD PLAN NO. SU-17



STANDARD PLAN NO. SU-28



NOTES

1. IF REMAINING PAVEMENT ADJACENT TO THE PATCH IS LESS THAN 3" DEEP, REMOVE AND REPLACE WITH ASPHALT. CONCRETE PATCHES TO MATCH EXISTING (MINIMUM 2 IN.).
2. HMA PAVEMENT SHALL NOT BE PLACED OVER EXISTING ASPHALT PAVEMENT.
3. THE TRENCH OF THE EXISTING ASPHALT PAVEMENT AND EXISTING SHALL BE PATCHED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH HOT ASPHALT. PATCHES SHALL BE PATCHED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH HOT ASPHALT. PATCHES SHALL BE PATCHED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH HOT ASPHALT.
4. ALL JOINTS BETWEEN THE NEW AND EXISTING ASPHALT PAVEMENT SHALL BE PATCHED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH HOT ASPHALT. PATCHES SHALL BE PATCHED WITH HOT ASPHALT OR ASPHALT EMULSION AND COVERED WITH HOT ASPHALT.
5. TEMPORARY PATCHES BETWEEN OCTOBER 1 AND MARCH 31 SHALL BE MADE WITH HMA PAVEMENT UNLESS OTHERWISE APPROVED.
6. ALL PERMANENT PATCHES SHALL BE RECTANGULAR OR CIRCULAR IN SHAPE AND CONSTRUCTED TO BE PARALLEL AND PERPENDICULAR TO THE ROAD CENTERLINE.

NOTE


1. REFER TO STANDARD PLAN NO. SU-16 FOR TRENCH REQUIREMENTS.

TRENCH PATCH REQUIREMENTS			
REPAIRS DEEPER THAN 12 IN. (305 MM)	REPAIRS DEEPER THAN 12 IN. (305 MM)	REPAIRS DEEPER THAN 12 IN. (305 MM)	REPAIRS DEEPER THAN 12 IN. (305 MM)
12" x 12"	12" x 12"	12" x 12"	12" x 12"
18" x 18"	18" x 18"	18" x 18"	18" x 18"
24" x 24"	24" x 24"	24" x 24"	24" x 24"
30" x 30"	30" x 30"	30" x 30"	30" x 30"
36" x 36"	36" x 36"	36" x 36"	36" x 36"

STANDARD PLAN NO. SU-15

SAMPLE PLAN

CITY OF TACOMA, PUBLIC WORKS DEPT. CONSTRUCTION DIVISION 747 MARKET STREET, ROOM 620 TACOMA, WASHINGTON 98402 (253)591-5760 FAX: (253)594-7966				FINL CHECKED DATE 04/30/04 SCALE NTS DESIGNED E.L.S. DRAWN R.L.O.H. BURNS-SPENCER STAMP SIGNATURE & DATE DATE APPROVED PROJECT ENGINEER ASSISTANT CONSTRUCTION DIVISION MANAGER		CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS NOTES AND DETAILS STREET, STORM AND SANITARY IMPROVEMENTS 60000000#### SHEET NO. PAGE 9 OF 9	
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						<div><div>FINAL CONSTRUCTION CHECKED</div><div>DATE</div><div>BY</div><div>DATE</div><div>FIELD BOOKS</div></div>		<div><div>SCALE</div><div>CHECKED</div><div>CHECKED</div><div>DRAWN</div><div>DWGNAME</div><div>PROJECT NUMBER</div></div>		<div><div>CITY OF TACOMA</div><div>DEPARTMENT OF PUBLIC WORKS</div><div><div>TITLE</div><div>LOCATION</div><div>CONTENT</div></div></div>		<div><div>SIG_ID</div><div>WO</div><div>SHEET NO. SHEET</div><div>PAGE PAGE-OF OF PAGE</div></div>	