



2021

City of Stayton Public Works Design Standards





FOREWORD

These Public Works Design Standards are intended to set minimum standards and provide a uniform set of guidelines for public works improvements within the City of Stayton. These Public Works Design Standards shall apply to all improvements within existing and proposed public right-of-way, within public utility and other related easements, to all improvements that ultimately will be owned, operated, or maintained by the City, and to all improvements for which the Stayton Municipal Code requires City approval.

Most of the elements contained in these Public Works Design Standards are public works oriented and are intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements under private contract designated herein. Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of public works improvement projects within the City shall comply in every respect with these Public Works Design Standards.

The Public Works Standards are intended to provide the following:

- ❖ Summarize, streamline, and provide general guidance and criteria on the administration, design and construction, and operation and maintenance of public works improvements and related facilities within the City.
- ❖ Set forth uniform construction standards for the materials and workmanship that is to be used within the City.
- ❖ Ensure the long-term viability of City infrastructure and to avoid excessive maintenance and replacement costs.
- ❖ Outline the provisions necessary to prevent or reduce adverse impacts to the environment and to the City's essential water resources.
- ❖ Supplement applicable public health, safety, and general welfare requirements of the Stayton Municipal Code, Stayton Fire District, State and Federal guidelines, etc.

If any improvements are proposed in the jurisdictional right-of-way of another agency such as Marion County or the Oregon Department of Transportation, the applicable standards from that jurisdiction will govern, including applicable permit requirements. In addition, any improvements in or near wetlands, sensitive areas, floodplains, and floodways may require State and Federal permits and/or approvals from the Army Corps of Engineers and/or the Oregon Department of State Lands (DSL). Other permits and standards may be applicable to specific projects. The Developer shall bear all the responsibility to obtain necessary permits and to apply with applicable standards related to any specific project.

It is anticipated that these Public Works Design Standards will be updated periodically by the City and, as such, all persons should ensure they are working with the most current set of Public Works Design Standards. In the case of conflicts between the text of the Public Works Design Standards, Standard Construction Specifications, Standard Drawings, and/or Standard Forms, the more stringent as determined by the City Engineer shall apply. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.

This edition of the Public Works Design Standards replaces all previous Public Works Design Standards. Being a totally new document, there may be some minor discrepancies or omissions. It would be appreciated if the users of these Public Works Design Standards would notify the City of any such corrections.

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DIVISION 1

GENERAL POLICIES, PROCEDURES, AND REQUIREMENTS

101 GENERAL

101.01 AUTHORITY AND PURPOSE

- 101.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City. Most of the elements contained in these Design Standards are public works oriented and it is intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements.
- 101.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects that ultimately will be owned, operated, or maintained by the City shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 101.01.C** The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of public improvements shall be implemented. All public system improvements and public works facilities shall be designed and constructed in accordance with applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals, and in accordance with applicable federal, state, and local statutes and rules. Approval of public improvements must be made by the City Engineer or the Public Works Director before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- 101.01.D** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every public improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 101.01.E** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.
- 101.01.F** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such modification will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.



- 101.01.G** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. Request must show that the modification meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All requests will be in writing and be accompanied by engineered drawings and final design calculations.
- 101.01.H** All franchise utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City Standards.
- 101.01.I** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.
- 101.01.J** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 101.01.K** On completion of projects to become public works, the Design Engineer shall submit one complete set of reproducible "Record Drawings" (As-Builts), a digital file containing electronic PDFs and cad files (AutoCAD or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification.
- 101.01.L** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 101.01.M** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.

101.02 APPLICABILITY

- 101.02.A** These Design Standards shall govern the design for the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Design Standards.

101.03 REFERENCES

- 101.03.A** These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed below

- ❖ Stayton Municipal Code (SMC)
- ❖ Stayton Comprehensive Plan
- ❖ Oregon Statewide Planning Goals and Guidelines
- ❖ Stayton Transportation System Plan (TSP)
- ❖ Stayton Master and/or Facility Plans
- ❖ Oregon Administrative Rules Chapter 333, 340(Division 52)
- ❖ State of Oregon Specialty Codes (Building and Fire Codes)
- ❖ State statutes and regulations
- ❖ Federal statutes and regulations



101.04 SPECIAL DESIGN APPLICATIONS

101.04.A Special design applications not covered in these Design Standards require review and approval by the City. Submittal of full design calculations, supplemental drawings, and information will be required prior to any approval. Such design applications requiring special review and approval include, but are not limited to, the following:

1. STREETS AND ALLEYS:
 - ❖ Bridges
 - ❖ Roundabouts/Traffic Calming
 - ❖ Traffic Signals
 - ❖ Electrical/Control/Telemetry Devices

2. WATER SYSTEM:
 - ❖ Treatment Plants
 - ❖ Reservoirs
 - ❖ Pump Stations
 - ❖ Pressure Regulating Devices
 - ❖ Flow Measurement/Monitoring
 - ❖ Electrical/Control/Telemetry Devices

3. SANITARY SEWER SYSTEM:
 - ❖ Treatment Plants
 - ❖ Sewer Facilities
 - ❖ Sewer Outfalls
 - ❖ Pump Stations and Force Mains
 - ❖ Electrical/Monitoring/Telemetry Devices
 - ❖ Siphons
 - ❖ Internal Sealing of Existing Sewers
 - ❖ Relining of Existing Mains
 - ❖ Energy Dissipaters
 - ❖ Flow Measurement/Monitoring
 - ❖ Hydrogen Sulfide and/or Hazardous Gases

4. STORM DRAIN SYSTEM:
 - ❖ Pump Stations and Force Mains
 - ❖ Electrical/Monitoring/Telemetry Devices
 - ❖ Siphons
 - ❖ Internal Sealing of Existing Storm Drains
 - ❖ Relining of Existing Storm Drains
 - ❖ Energy Dissipaters
 - ❖ Bank protection
 - ❖ Flow Measurement/Monitoring

101.05 STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS

101.05.A Except as otherwise provided by these Design Standards, all construction design detail, workmanship, and materials shall be in accordance with the current edition of the City of Stayton Public Works Standard Construction Specifications and Standard Drawings.



101.06 CITY POLICY REGARDING ENGINEERING

- 101.06.A** It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.
- 101.06.B** Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction, and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.
- 101.06.C** City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required, the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm, then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.

101.07 CONVENTIONS USED THROUGHOUT THE DESIGN STANDARDS

101.07.A GENERAL

1. The provisions of Oregon Revised Statutes Chapter 279A and 279C and Oregon Administrative Rules Chapter 137, Divisions 46 and 49, apply to all publicly financed public improvement projects that incorporate the Public Works Standards of the City of Stayton into the Contract. The ORS and OAR provisions control over any conflicting language in the Public Works Standards.
2. In interpreting these Design Standards, it is understood that if the context so requires:
 - ❖ The singular pronoun shall be taken to mean and include the plural pronoun.
 - ❖ The masculine pronoun shall be taken to mean the feminine and the neuter pronoun.
 - ❖ All captions used therein are intended solely for the convenience of reference and shall in no way limit any of the provisions of these Design Standards.
3. The words "directed", "required", "permitted", "ordered", "requested", "instructed", "designated", "considered necessary", "prescribed", "approved", "acceptable", "satisfactory", or words of like import, refer to actions, expressions, and prerogatives of the City.
4. Command type sentences are used, but are not exclusive of other directives throughout these Design Standards. In all cases the command expressed or implied is directed to the Design Engineer and/or Developer.
5. The words, "as shown", "shown", "as indicated", or "indicated" or words of like import, refer to as indicated on the Plans or Standard Drawings.



101.07.B REFERENCES TO LAWS, ACTS, REGULATIONS, RULES, ORDINANCES, STATUTES, ORDERS, AND PERMITS

1. References are made in the text of the Standards to "laws", "acts", "rules", "statutes", "regulations", "ordinances", etc. (collectively referred to for purposes of this Subsection as "Law"), and to "orders" and "permits" (issued by a governmental authority, whether local, state, or federal, and collectively referred to for purposes of this Subsection as "Permits"). Reference is also made to "applicable laws and regulations". The following conventions apply in interpreting these terms, as used in the Standards.
 - ❖ **Statutes and Rules** - Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OAR) referenced in the Specifications are accessible online, including through the Oregon Legislative Counsel Committee website and through the Oregon Secretary of State Archives Division website.
 - ❖ **Law** - In each case, unless otherwise expressly stated therein, the Law is to be understood to be the current version in effect. This also applies where a specific Law is referenced or cited, regardless of whether the text of the Law has been included in the Standards or not, and regardless of whether the text of the Law has been summarized or paraphrased. In each case, the current version of the Law is applicable under any contract. The reader is therefore cautioned to check the actual text of the Law to confirm that the text included in the Standards has not been modified or superseded.
 - ❖ **Permits** - Orders and permits issued by a government agency may be modified during the course of performing the work under a contract. Therefore, wherever the term "order" or "permit" is used in the Standards, it is intended to refer to the then-current version. That version may be embodied in a modified, superseding order or permit, or it may consist of all terms and conditions of prior orders or permits that have not been superseded, as well as the additional terms added by amendment or supplement. In certain cases, the orders and/or permits are identified by name in the Standards; in other cases, the terms are used in the generic sense. The reader is cautioned to check the text(s) of each order and permit identified either by name or by generic reference.
 - ❖ **Applicable Laws and Regulations** - Where the phrase "applicable laws and regulations" appears, it is to be understood as including applicable laws, acts, regulations, administrative rules, ordinances, statutes, and orders and permits issued by a governmental or regulatory authority.

101.08 ORGANIZATION AND CLASSIFICATION OF DIVISIONS

101.08.A ORGANIZATION

1. The Design Standards contained herein are divided into categories: DIVISION; SECTION; and SUBSECTION, and are designated as in the following example:

DIVISION 3 – STREETS AND ALLEYS

SECTION – 305 PAVEMENT DESIGN

SUBSECTION – 305.02 ASPHALT CONCRETE PAVEMENT

2. In addition, throughout the Design Standards:
 - ❖ Reference to a Section includes applicable requirements of the Section.
 - ❖ When referring to a Subsection, only the number of the Subsection may be used; the word "Subsection" is therefore implied.



- ❖ Where Section and Subsection numbers are not consecutive, the interval has been reserved for future expansion of the Standards.
- ❖ Paragraphs under Subsections are shown alphabetical (A), (B), etc. with subparagraphs shown numbered (1), (2), etc. Any further subparagraphs are alternated alphabetical and numerical.

101.08.B CLASSIFICATION OF DIVISIONS

1. The classification of Divisions contained in the Design Standards is as follows:
 - a. DIVISION 1 – Contains specific information for the **GENERAL POLICIES, PROCEDURES, AND REQUIREMENTS** for the design of public works improvements. It contains many of the definitions and abbreviations used throughout these Design Standards.
 - b. DIVISION 2 – Contains the **GENERAL TECHNICAL REQUIREMENTS** for the design of public works improvements that are to be operated and maintained by the City.
 - c. DIVISION 3 – Contains specific requirements for the design of **STREETS AND ALLEYS** that are to be operated and maintained by the City.
 - d. DIVISION 4 – Contains specific requirements for the design of **WATER DISTRIBUTION** systems that are to be operated and maintained by the City.
 - e. DIVISION 5 – Contains specific requirements for the design of **SANITARY SEWERS** that are to be operated and maintained by the City.
 - f. DIVISION 6 – Contains specific requirements for **STORMWATER MANAGEMENT** and the design of both private and public stormwater management facilities and public storm drains and that are to be operated and maintained by the City.
 - g. DIVISION 7 – Contains specific requirements for **EROSION AND SEDIMENT CONTROL** for both private and public site development projects for all phases (pre-, post-, and throughout construction) of the project.

101.09 CLARIFICATIONS, MODIFICATIONS, AND REVISIONS TO THE DESIGN STANDARDS AND STANDARD DRAWINGS

101.09.A GENERAL

1. These Design Standards and Standard Drawings are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Subsection 101.03. Periodic revisions to these Standards will be necessary to maintain consistency in that regard. The date appearing on the title page is the date of the latest revision for each Division. Parenthetical notations at the bottom of each page indicate the most recent change. It will be the user's responsibility to obtain and maintain his/her copy of these Standards with the latest changes.
2. Any user of this document may submit a request for clarification, a design modification request, or proposed revision to these Standards.



101.09.B REQUEST FOR CLARIFICATIONS

1. Requests for clarification or suggestions for revisions to these Standards should be submitted in writing to the City as follows:

City of Stayton
Public Works Department
Attn: Design Standard Clarification
362 N. 3rd Avenue
Stayton, OR 97383
2. Any submitted request for clarifications or interpretations will be provided by the City Engineer and/or Public Works Director. The Public Works Director is the final authority on all questions which may arise as to the interpretation of these Standards.

101.09.C DESIGN MODIFICATION REQUEST

1. A Design Engineer may request that the City Engineer and/or Public Works Director modify a City standard relating to, and only for, a specific project by submitting a written request for such modification to the City. Design Modification Requests (DMR) may be requested during design or during construction when determined by the City Engineer and/or Public Works Director to be applicable. When DMRs involve or will have an impact on public safety, the City will rule in the direction of safety.
2. SUBMITTAL REQUIREMENTS FOR DESIGN MODIFICATION REQUESTS (DMR)
 - a. DMRs shall be submitted in writing using the DMR Form, found in Appendix C of the City of Stayton Design Standards, to the City as follows:

City of Stayton
Public Works Department
Attn: Design Modification Request
362 N. 3rd Avenue
Stayton, OR 97383
 - b. This written request shall state the desired modification, the reason for the requested modification, the conditions in Subsection 101.09.C.3 that apply to the desired modification, and a comparison between the Standard and the modification as far as performance and maintenance requirements.
 - c. Any modification or variance of these Standards should be documented and reference nationally accepted standards and must meet or exceed the minimum requirements set forth in these Standards. The use thereof shall not compromise public safety or intent of the City's Standards.
 - d. The written request is to include, but is not limited to, the manufacturer's specifications and testing results, design drawings, design calculations, and other pertinent information.
 - e. Any deviations or special problems will be reviewed on a case-by-case basis and approved by the City Engineer and/or Public Works Director.



3. CRITERIA FOR DESIGN MODIFICATION REQUESTS

- a. The City Engineer and/or Public Works Director may make project-specific modifications and amendments to an existing City Standard when any one of the following conditions is met:
 - ❖ The Standard is inapplicable to a particular situation.
 - ❖ Topography, right-of-way, or other geographical conditions or impediments impose an undue economic hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety, accessibility, or anticipated life of facility.
 - ❖ A change to a Standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.
 - ❖ The modification or amendment will be de minimis, per Subsection 101.09.E.

4. CITY REVIEW PROCESS FOR DESIGN MODIFICATION REQUESTS

- a. The City Engineer and/or Public Works Director will review a DMR to relating to, and only for, a specific project. Response to the DMR will occur within fourteen (14) calendar days. The City Engineer and/or Public Works Director will:
 - ❖ Approve the request as proposed;
 - ❖ Approve the request with conditions; or
 - ❖ Deny the request.
- b. The City Engineer and/or Public Works Director's decision will be as indicated on the DMR Form. A denial of a request will be accompanied with a brief explanation of the reason for the denial.
- c. Whether a request for modification is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or revision of the City Standard.
- d. The applicant may appeal the City Engineer's decision regarding the DMR by filing a written appeal to the Public Works Director within fourteen (14) calendar days of the City Engineer's decision. The Public Works Director will consider the appeal and render a decision within seven (7) calendar days of the date the appeal is received by the City.
- e. The applicant may appeal the Public Works Director's decision regarding the DMR by filing a written appeal to the City Council, as provided in the Stayton Municipal Code.

101.09.D CITY-INITIATED MODIFICATIONS

- 1. During design or construction of a project, the City Engineer and/or Public Works Director may:
 - a. Modify and/or add requirements applicable to a specific City-approved project. Such addition or modification is for project-specific use and shall not constitute a precedent or revision of the City Standard.
 - b. The applicant may appeal the City Engineer's decision regarding the DMR by filing a written appeal to the Public Works Director within fourteen (14) calendar days of the City



Engineer's decision. The Public Works Director will consider the appeal and render a decision within seven (7) calendar days of the date the appeal is received by the City.

- c. The applicant may appeal the Public Works Director's decision regarding the DMR by filing a written appeal to the City Council, as provided in the Stayton Municipal Code.

101.09.E REVISIONS

1. These Standards will be periodically updated due to changes in policy or procedures, new technology, design methods, and construction methods. Updates to these Standards will be posted on the City's website.
2. The City will make the following changes or corrections to the provisions of these Standards when the changes or corrections do not alter the sense or meaning of its provisions:
 - ❖ Misspellings. Misspelled words may be corrected.
 - ❖ Histories. Erroneous legislative histories may be corrected.
 - ❖ Cross-references. Cross-references may be changed to agree with new, amended, reenacted, renumbered, re-lettered, reallocated or corrected ordinances or resolutions.
 - ❖ Capitalization. Improper capitalization may be corrected.
 - ❖ Headings. Descriptive headings of titles, chapters, sections or subsections may be edited or added to briefly and clearly indicate the subject matter of the title, chapter, section or subsection.
 - ❖ Renumbering; re-lettering. The numbering or lettering of sections of ordinances and resolutions, including duplicative numbering or lettering created by conflicting enactments, may be corrected or properly arranged.
 - ❖ Changed job titles; agency names. References in these Standards to specific job titles or agency names that are changed without substantial affect on job or agency responsibilities may be changed to refer to the new job title or agency name.
 - ❖ Punctuation. Punctuation, including hyphenization, may be corrected.
 - ❖ Clerical Errors. Typographical or grammatical errors may be corrected.
 - ❖ Gender. Gender-specific terms that occur in an ordinance or resolution may be changed to gender-neutral terms and necessary grammatical changes to properly use the gender-neutral terms may be made.
 - ❖ Mandated Changes. Additions, deletions, or revisions to these Standards may be made when required for City compliance with mandatory local, regional, state, or federal regulations.
 - ❖ De minimis Changes. Additions, deletions, or revisions to these Standards may be made where the addition, deletion, or revision will have no material effect on the cost of constructing the item affected by the changed Standard. A material effect on the cost of constructing an item affected by a changed Standard is an increase or decrease in the cost of constructing an item that is greater than five percent (5%) of the cost of constructing the item under existing Standards. If a change to a Standard affects a specific project, the change, in addition to having no material effect on the cost of constructing the item affected by the changed Standard, must also have no material effect on the cost of a project. A material effect on the cost of a project is an increase or decrease in the cost of the project that is greater than one-tenth of one percent (0.1%) of the estimated total cost of the project at the time of issuance of the project's permit. If the City Engineer makes two or more de minimis changes to a Standard under the authority of this paragraph that affect a specific project, each de minimis change must meet the above requirements of this paragraph by (a) having no



material effect on the cost of constructing the item affected by the changed Standard and (b) having no material effect on the cost of a project. In addition, the combined effect of the multiple changes to the Standards relating to that specific project must not increase or decrease the total cost of a project by more than three-tenths of one percent (0.3%) of the estimated total cost of the project at the time of issuance of the project's site development permit.

101.10 DEFINITIONS AND TERMS

Unless otherwise defined by applicable law or the Contract Documents, the following definitions and abbreviations shall apply whenever used.

3D Engineered Model

The City-prepared electronic file(s) that identify northing, easting, and elevation to represent the Work to be performed. The 3D Engineered Model may include the surface model(s) or other designed Work elements and is an electronic representation of the line, grade, and Cross Section applicable to the Project.

3D Construction Model

Supplemental unstamped 3D model, not furnished by the City, that the Contractor is required to submit to the City Engineer.

Acceptance of Work

See Final Acceptance.

Alley

A public way or thoroughfare not more than 20 feet but not less than 10 feet in width which has been dedicated or deeded to the public for public use providing a secondary means of access to property, except in a downtown zone, where it may be the primary means of vehicular access.

Aggregate

Rock of specified quality and gradation.

Approved or Approval

Acceptance, given to the Contractor by the City Engineer, for specific materials, construction or manufacturing processes, changes in contract conditions, or any other items to be used in the Work.

Approved Equal

A product, component, or process whose use in or on a particular project is specified as a standard for comparison purposes only. The "equal" product, component, or process shall be the same or better than that named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made solely by the City Engineer.

Approved Backflow Prevention Assembly

A testable assembly that has been investigated and approved by the Oregon Department of Human Services – Drinking Water Program.

Arterial Street

See Street.

As-Builts

See Record Drawings.



Attorney-in-Fact

An Entity appointed by another to act in its place, either for some particular purpose, or for the transaction of business in general.

Average Daily Demand

The total volume of water delivered to the system in one (1) year divided by three-hundred and sixty-five (365) days.

Backflow

The reverse of flow from its normal or intended direction of flow. Backflow can be caused by back-pressure or back-siphonage.

Backflow Preventer

An approved means to prevent backflow into the potable water system.

Back-siphonage

Backflow that results from negative pressure (partial vacuum) in the supply piping system.

Base

A Course of specified material of specified thickness placed below the pavement.

Bikeway

Any road, path, or way that is some manner specifically open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are shared with other transportation modes. The four types of Bikeways are as follows:

- ❖ **Bike Lanes**
A lane, typically 6 feet in width, in the Traveled Way, designated by striping and Pavement markings for the preferential or exclusive use of bicyclists.
- ❖ **Bike Path**
A designated travel-way for bicyclists that is completely separated from the vehicular travel lanes and is within independent rights-of-way.
- ❖ **Shared Bikeway**
A travel-way for a bicyclist, typically consisting of a paved shoulder that is 4-feet or wider, that is shared with vehicular traffic. The bike way is designated with signs for bicycling (no pavement markings for the bike lanes) and typically shared by bicyclists and pedestrians in rural areas. Synonymous with the term bike route.
- ❖ **Shared Roadway**
A travel lane that is shared by bicyclists and motor vehicles.

Best Management Practices (BMPs)

Schedules of activities, prohibitions of practices, maintenance procedures or other management practices to prevent or reduce the pollution of waters of the state. BMPs for storm water may include operational and structural source controls that minimize and prevent contaminants from entering storm water as well as treatment BMPs that remove contaminants contained in storm water runoff before disposal or discharge.

Boulders

Particles of Rock that will not pass a 12-inch square opening.



Bridge

A single or multiple span structure, including supports, that carries motorized and non-motorized vehicles, pedestrians, or utilities on a roadway, walk, or track over a watercourse, highway, railroad, or other feature.

Building Fire Flow Requirements

Fire flow requirements based on type of occupancy and building material construction.

Building Water Supply

The pipe carrying potable water from the water meter or other approved source of water supply to a building. Building water supply shall also mean customer service line.

Building Official

The person(s) empowered by the City Council to administer and enforce the Stayton Municipal Code and building, plumbing, electrical, and other similar codes.

Buttress

A Rock fill placed at the toe of a landslide or potential landslide in order to resist/slide movement. Also can be a perpendicular wall to retaining wall to reinforce from overturning.

CAD

Computer aided design.

Check Valve

A valve which allows flow in only one direction.

City

The City of Stayton, a municipal corporation of the State of Oregon, and its elected officials, officers, employees, volunteers and agents.

City-Controlled Lands

Lands owned by the City, or controlled by the City under lease or agreement, or under the jurisdiction and control of the City for the purposes of the Contract.

City Attorney

A licensed attorney hired or appointed by the City Council to provide legal advice and assistance to the City Council, the Planning Commission, and City officials.

City Engineer

A registered professional engineer licensed to practice in the State of Oregon, or his/her authorized representative, acting under the direction of the Public Works Director, who directs and coordinates engineering activities relating to City of Stayton Public Works. The Public Works Director shall have the same rights and authority assigned to the City Engineer if the Public Works Director is also a registered professional engineer licensed to practice in the State of Oregon.

City Inspector

The authorized representative of the City whose authority, instructions, and decisions shall be limited to the particular duties and responsibilities entrusted to him in making detailed inspections of any or all portions of the work or materials therefore.



City Manager

An appointed official to serve as chief executive and administrative officer to support the information and policy-making needs of the Council, implement Council decisions and directives, and manage the day-to-day operations of City departments. Under the Council/Manager form of government, the Council establishes policies for operations within the City, and it is the City Manager's responsibility to ensure these policies are carried out.

Clay

Soil passing a No. 200 sieve that can be made to exhibit plasticity (putty-like properties) within a range of water contents.

Clear Zone

The total roadside border area, starting at the edge of the Traveled Way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a nonrecoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry.

Close Conformance

Where working tolerances are given on the Plans or in the Specifications, Close Conformance means compliance with those tolerances. Where working tolerances are not given, Close Conformance means compliance, in the City Engineer's judgment, with reasonable and customary manufacturing and construction tolerances.

Coarse Aggregate

Crushed Rock or crushed Gravel retained on a 1/4-inch sieve, with allowable undersize.

Cobbles

Particles of Rock, rounded or not, that will pass a 12-inch square opening and be retained on a 3-inch sieve.

Code

The City of Stayton Municipal Code (SMC) and ordinances and any other federal, state, county, or local codes, laws, or regulations affecting the work.

Collection Systems

Facilities maintained by the City connected thereto for the collecting, pumping, conveying, and controlling of sanitary sewer.

Collector Street

See Street.

Commercial Grade Concrete

Concrete furnished according to Contractor proportioning, placed in minor Structures and finished as specified.

Commercial User

Any user of the sanitary sewer who is neither a residential nor an industrial user. This definition is specific to these Design Standards and is not intended to be used for billing purposes.

Construction Plans

See Plans.



Contract

The written agreement in the Contract Documents that sets forth the rights and obligations of the City and the Contractor for publicly financed public improvements. Synonymous with the term Agreement.

Contract Documents

The Contract, including the Invitation to Bid, Instructions to Bidders, the Proposal, Contract, General Conditions (General Requirements), Supplementary Conditions (Special Provisions), Plans, Specifications, schedule of Contract Prices, Addenda, Permits, Payment and Performance Bonds, Insurance Certificate, and Change Orders for any approved revisions made during the performance of the work to any of the above listed documents for publicly financed public improvements.

Contractor

Any individual, firm, co-partnership, corporation or any combination thereof who has or have entered into a Contract either with the City or will be performing public works improvements as part of a particular development or permitted project. For publicly financed public improvement projects, “contractor” will mean the entity awarded the Contract. For privately financed public improvement projects and other work being performed under permit issued by the City, the “contractor” will mean the entity that is listed on the permit.

Cooling Water

Water other than sewage or industrial waste that is used as a medium for carrying away excess heat and that is not co-mingled with any other liquid waste or solids carrying stream.

Copy

An imitation or reproduction of an original; a duplicate.

Core

To cut and remove a portion of pipe, manhole, or pavement with a circular hollow drill.

Course

A specified Surfacing Material placed in one or more Lifts to a specified thickness.

Coverage

A single Pass by a piece of Equipment over an entire designated area.

Creek

Any and all surface water routes generally consisting of a channel having a bed, banks, and/or sides in which surface waters flow in draining from higher to lower land, both perennial and intermittent; the channel, banks, and intervening artificial components, excluding flows that do not persist for more than twenty-four (24) hours after cessation of 1/2-inch of rainfall in a twenty-four (24) hour period from October through March.

Cross Connection

Any actual or potential connection, link, or channel between a domestic water supply system and a pipe or piping system used or intended to be used for some other purpose or between a domestic water supply system and a plumbing fixture, appliance, receptacle, vessel, or other service, or a source other than the intended source of water supply whereby it may be possible for contaminated water or water of questionable or unsafe quality, or fluid substance other than potable water, to enter any part of the domestic water supply system.



Cross Section

The exact image formed by a plane cutting through an object, usually at right angles to a central axis, to determine area or to show detail.

Cul-de-sac

A dead-end street having a circular turnaround area at the end.

Curb

A concrete or asphalt line, typically six-inches wide and six-inches of exposure, indicating the edge of the vehicular roadway within the overall Right-of-Way to: serve as a safety barrier to prevent motorists from driving onto the shoulder, median, sidewalk, pavement, or other designated non-vehicular pathway; and/or to control or direct stormwater drainage along a vehicular roadway.

Cut Sheets

Sheets of tabulated data indicating stationings, structures, fittings, angle points, beginning of curve, points on curve, end of curves, street grade, pipe slope, staking offset, various elevations, and offset cuts for streets, waterlines, sanitary sewers, and storm drains.

Datum, Horizontal

The horizontal survey control network of the City of Stayton.

Datum, Vertical

The vertical elevation survey control network of the City of Stayton identified as "The North American Vertical Datum of 1988 (NAVD88).

Dead-end Street

See Street.

Definition of Words

That whenever in these Design Standards, the words "shall", "will", "directed", "required", "permitted", "ordered", "designated", or words of like importance are used, they shall be understood to mean the direction, requirement, permission, or order of designation of the Design Engineer. Similarly, the words "approved", "acceptable", or "satisfactory", shall mean approved by, acceptable to, or satisfactory to the City Engineer.

Design Engineer

A registered professional engineer licensed to practice in the State of Oregon who is responsible for the design of a privately financed public improvement or public improvement project and has stamped and sealed the plans.

Design Intensity

The uniform rainfall intensity, inches per hour, associated with a duration equal to the time of concentration of the basin and a specified return frequency (e.g., 2-year, 10-year, etc.) that is used to calculate the peak discharge rate to be used for stormwater system design.

Design Storm

A rainfall event of a specified duration (e.g., 6-hour, 12-hour, 24-hour) and return frequency (e.g., 2-years, 10-years, etc.) that is used to calculate the runoff volume and/or discharge rate to be used for stormwater system design.

Detention

The storage and subsequent release of excess stormwater runoff to control peak discharge rates prior to discharge to the storm drain or natural drainageway.



Detention Volume

The storage volume required to control the peak discharge rates at the point of discharge from a development.

Developer

Any individual, partnership, corporation, joint venture, or other legal entity in the primary business of developing real property.

Development

Any man-made change to improved or unimproved real estate, whether public or private for which a permit is required, including but not limited to, construction, installation, or alteration of buildings or other structures, condominium conversion, land division, establishment or termination of a right of access, parking or storage facilities on real property, tree cutting, and clearing, mining, dredging, filling, grading, paving, excavation or drilling operations. Development encompasses both new development and redevelopment.

Development Footprint

The new or redeveloped area covered by buildings or other roof structures and other impervious surface areas, such as Roads, parking lots, and sidewalks.

Direct Discharge

Any stormwater discharge from a developed site that has not passed through approved water quality treatment or detention facility prior to its ultimate outfall to a natural drainageway, wetland, or other natural resource area.

Discharge Point

The ultimate destination for the stormwater leaving a particular site, also known as the stormwater disposal point. Discharge can be through: onsite infiltration (surface infiltration facilities, soakage trenches, etc.) or offsite flow to ditches, drainageways, streams, or public or private separate stormwater piped systems.

Distribution System

Distribution main pipelines, pumping stations, valves, and associated equipment used to transmit water from the supply source to the service line.

Domestic Sewer

The liquid and water-borne waste derived from the ordinary living processes, free from industrial wastes, and of such character to permit satisfactory disposal, without special treatment, into the public sanitary sewer system or by means of private sanitary sewer disposal system.

Double Check Valve Assembly (DCVA)

An assembly composed of two single, independently acting approved check valves, including tightly closing shut-off valves located at each end of the assembly and fitted with properly located test cocks.

Double-Detector Check Valve Assembly (DDCVA)

An approved double check valve assembly with a parallel meter. The purpose of this assembly is to provide double-check valve protection for the distribution system and at the same time provide partial metering of the fire system showing any system leakage or unauthorized use of water.



Drainageway

An open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water. It may be permanently or temporarily inundated.

Drainage Basin

Stormwater drainage basins for the City of Stayton, as defined in the Storm Water Master Plan.

Drainage Facilities

Pipes, ditches, detention basins, creeks, culvert bridges, etc., used singularly or in combination with each other for the purpose of conveying or storing stormwater run-off.

Drainage Report

A required stormwater report prepared by the Design Engineer that provides a hydrologic and hydraulic evaluation of the stormwater impacts associated with a particular development. The report shall demonstrate how the proposed stormwater management and water quality facilities will comply with City public works standards. The report must be signed and stamped by a professional engineer registered in the State of Oregon.

Drawings

See Plans.

Driveway

A minor private way used by vehicles and pedestrians to gain access from an approved public access or right-of-way onto a lot or parcel of land.

Drywell

See Stormwater Sump.

Durable Rock

Rock that has a slake durability index of at least ninety percent (90%) based on a two-cycle slake durability test, according to ASTM D4644. In the absence of test results, the City Engineer may evaluate the durability visually.

Dwelling Unit

A facility designed for permanent or semi-permanent occupancy and provided with minimum kitchen, sleeping and sanitary facilities for one family.

Easement

An area outside public right-of-way in which the property owner (grantor) conveys a privilege to a second party (grantee) the right to construct, operate, and maintain public works facilities on such property. The City is typically grantee for public easements, and a neighboring property owner is typically grantee for private easements.

Emulsified Asphalt

An emulsion of asphalt cement and water with a small quantity of an emulsifying agent.

Emulsified Asphalt Concrete

A mixture of Emulsified Asphalt and graded Aggregate.

Engineer of Record

See Design Engineer



Entity

A natural person capable of being legally bound, sole proprietorship, limited liability company, corporation, partnership, limited liability partnership, limited partnership, for-profit or nonprofit unincorporated association, business trust, two or more persons having a joint or common economic interest, or any other person with legal capacity to Contract, or a government or governmental subdivision.

Equipment

All machinery, tools, manufactured products, and fabricated items needed to complete the Contract or specified for incorporation into the Work.

Establishment Period

The time specified to assure satisfactory establishment and growth of planted Materials.

Existing Surfacing

Pavements, slabs, curbs, gutters, walks, driveways, and similar constructions of bricks, blocks, Portland Cement Concrete, bituminous treated materials, and granular Surfacing materials on existing streets and alleys.

Expansion Joint

A joint to control cracking in the concrete surface structure and is filled with preformed expansion joint filler.

Final Acceptance

The date at which the City accepts the public improvements for ownership and operation upon successful correction of any noted Warranty deficiencies and upon payment of all fees and charges to the City.

Final Completion

The date at which the work, and all related aspects of the work, has progressed to the point where, in the opinion of the City Engineer, all requirements of the Contract Documents have been met with the exception of Warranty obligations; all construction equipment and unused materials have been removed; all waste has been removed and the project area thoroughly cleaned and restored and when the Work is one-hundred percent (100%) complete in every respect and can be utilized for the purpose for which it was intended and the Project.

Final Inspection

The inspection, conducted by the City Engineer and/or City Inspector, to determine that the Project has been completed in accordance with the Contract.

Fine Aggregate

Crushed Rock, crushed Gravel, or Sand that passes a 1/4 inch sieve, with allowable oversize.

Fire Protection Service

A connection to the public water main intended only for the extinguishment of fires and the flushing necessary for its proper maintenance.

Flood Insurance Rate Map (F.I.R.M.)

The official map on which the Federal Emergency Management Agency shows flood elevations for various creeks and rivers and has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.



Floodplain

Areas shown on the Flood Insurance Rate Map as areas of special flood hazard.

Floodway

The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than 1 foot.

Flow Control

The practice of limiting the release of peak flow rates and volumes from a site. Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increased stormwater runoff peak flow rates resulting from development.

French Drain or Leach Line

A covered underground excavated trench filled with washed gravel that surrounds a perforated delivery pipe used to receive storm water, wherein the sides and bottom of the trench are porous, permitting the storm water to seep into the ground.

Granular Material

Graded and selected free-draining material composed of particles of Rock, Sand, and Gravel.

Grade

The degree of inclination of a Road or Slope.

Gravel

An unconsolidated mixture of Rock fragments or particles of Rock, rounded or not, that will pass a 3-inch sieve and be retained on a No. 4 sieve.

Highway

Every Road, Street, thoroughfare and place, including Bridges, viaducts and other Structures within the boundaries of the State, open, used or intended for use by vehicular traffic.

Hydrant Lead

The waterline connecting the fire hydrant to the auxiliary valve on the City distribution main. Synonymous with the term Hydrant lateral.

Impervious Surfaces/Areas

Any surface that has a runoff coefficient greater than 0.80, as defined in PWDS Section 603. Common impervious surfaces include, but are not limited to rooftops, concrete or asphalt sidewalks, walkways, patio areas, driveways, parking lots or storage areas and graveled, oiled, macadam or other hard surfaces. Slatted decks and some gravel surfaces are considered pervious unless they cover impervious surfaces or the gravel surfaces are compacted to a degree that causes their runoff coefficient to exceed 0.80.

Improvements

General term encompassing all phases of work to be performed under a Contract and is synonymous with the term Project or Work.

Industrial User

A business establishment that uses water in a variety of chemical, manufacturing, refining, or other material processing operations, which results in sanitary sewer that is significantly altered in strength, composition, and character from that of domestic sewage. This definition is specific to these Design Standards and is not intended to be used for billing purposes.



Industrial Waste

Solid, liquid, or gaseous waste resulting from any industrial, manufacturing, trade, or business process from development, recovery, or processing of natural resources.

Infiltration

The percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. See also Subsurface Infiltration and Surface Infiltration.

Infiltration Test

Infiltration tests are conducted to determine the feasibility of on-site stormwater percolation for every new development.

Inlet

A structure or other appurtenance (i.e., catch basin) that collects stormwater runoff from the ground surface for the purpose of conveying it through a piped storm system. Also used to describe the connection point of a pipe conveying stormwater into a junction structure.

Interceptor Sewer

A primary public sanitary sewer pipe that conveys sanitary sewer directly into the Wastewater Treatment Plant.

Irrigation Service

A metered connection intended for seasonal use and delivering water that is not discharged to the sanitary sewer system.

Junction

A structure (i.e., catch basin or manhole) within a storm drain system for the purpose of combining multiple pipe inlets, facilitating changes in horizontal or vertical alignment, providing access for operation and maintenance, or other related function.

Leveling

Placing a variable-thickness Course of Materials to restore horizontal and vertical uniformity to existing Pavements, normally continuous throughout the Project.

Lift

The compacted thickness of material specified for use in the construction of the Project or for incorporation into the Work placed by Equipment in a single Pass.

Local Street

See Street.

Longitudinal Joint

An interface between two adjacent asphalt or concrete mats, which in regards to hot-mixed asphalt surfacing of roadways, typically follows a course approximately parallel to the centerline of the roadway.

Low Impact Development

A sustainable landscaping approach that can be used to replicate or restore natural watershed functions and/or address targeted watershed goals and objectives.



Major Trees

Trees that are 30-inches or larger in diameter and are either within the right-of-way or public easement or are within 10-feet of the right-of-way or public easement. Major trees are important to the City and design modifications of public facilities may be required to accommodate tree preservation.

Manufactured Treatment Device

A manufactured device, often proprietary, in which stormwater receives treatment before being discharged to another BMP or to the receiving water. This is a broad category of BMPs with a variety of pollutant removal mechanisms and varying pollutant removal efficiencies.

Master Plans

Documents adopted by Stayton City Council that describe and evaluate the City's public infrastructure, including existing and planned transportation, water, sanitary sewer, and storm drain systems.

Materials

Any natural or manmade substance specified for use in the construction of the Project or for incorporation into the Work.

Maximum Daily Demand

The maximum volume of water delivered to the system in any single day of the year.

Maximum Extent Feasible

The extent to which a requirement or Standard must be complied with as constrained by the physical limitations of the site, practical considerations of engineering design, and reasonable considerations of financial costs and environmental impacts.

Median

The portion of a divided Highway or Street separating traffic traveling in opposite directions.

Minor Partition

See Partition.

Multiple Course Construction

Two or more Courses, exclusive of Patching or Leveling, placed over the entire Roadway width.

Multiple Family Dwelling

A building or portion designed thereof for occupancy by two or more families, living independently of each other.

Multi-Use Path

That portion of the highway or street Right-of-Way or a separate Right-of-Way, physically separated from motor vehicle traffic and designated for use by pedestrians, bicyclists and other non-motorized users.

MUTCD

The Manual on Uniform Traffic Control Devices as published by the Federal Highway Administration.

Natural Grade

The grade of the land in an undisturbed state.



Natural Location

The location of channels, swales, and other non-manmade conveyance systems, as defined by the first documented topographic contours existing for the subject property, either from maps or photographs.

Neat Line

Theoretical lines specified or indicated on the Plans for measurement of quantities.

Nondurable Rock

Rock that has a slake durability index of less than 90% based on a two-cycle slake durability test, as tested by ASTM D4644, or Rock that is observed to readily degrade by air, water, and mechanical influence.

Notice

A written communication delivered by hand or by mail to the authorized individual, member of the firm or officer of the corporation for which it is intended. If delivered or sent by mail it shall be addressed to the last known business address of the individual, firm or corporation. In the case of a Contract with two (2) or more persons, firms or corporations, notice to one shall be deemed notice to all.

Notice of Final Acceptance

Written confirmation by the City Engineer and/or Public Works Director stating that the City has made Final Acceptance of the Project and thereby authorizing the release of the Warranty.

Notice of Final Completion

Written confirmation by the City Engineer and/or Public Works Director that the Project has reached Final Completion, thereby initiating the Warranty period.

Notice of Substantial Completion

Written confirmation by the City Engineer and/or Public Works Director when the Work, or a specified part thereof, has reached Substantial Completion. The Notice of Substantial Completion may also provide a punch list of remaining items for the Project that have yet to be completed.

ODOT Standard Specifications for Construction

The latest edition of the Specification Document published by the Oregon Department of Transportation and the American Public Works Association entitled Oregon Standard Specifications for Construction. This document is available from the Oregon Department of Transportation, Salem, Oregon.

Offsite Stormwater Facility

Any stormwater management facility located outside the property boundaries of a specific development but designed to reduce pollutants from and/or control stormwater flows for that development.

On-Site Stormwater Facility

Any stormwater management facility located within the property boundaries of a specific development and designed to reduce pollutants from and/or control stormwater flows for that development.

On-Site Work

Any Work taking place on the Project Site, including designated staging areas adjacent to the Project Site.



Organic Soil

A Soil with sufficient organic content to influence the Soil properties.

Outfall

The point at which collected, concentrated stormwater is discharged, generally from a pipe(s), from a development to an open drainage element such as a ditch, channel, swale, stream, river, pond, lake or wetland.

Owner

The owner of record of real property as shown on the latest tax rolls or deed records of the County, and includes a person who furnishes evidence that he/she is purchasing a parcel of property under a written recorded land sale contract. For public improvement projects, the owner is the City of Stayton, acting through its legally constituted City Council.

Panel

The width of specified Material being placed by Equipment in a single Pass.

Pass

One movement of a piece of Equipment over a particular location.

Patching

Placing a variable-thickness Course of Materials to correct sags, dips, and/or bumps to the existing grade and Cross Section, normally intermittent throughout the Project.

Pavement

Asphalt concrete or Portland cement concrete placed for the use of motor vehicles, bicycles, or pedestrians on Roadways, Shoulders, Multi-Use Paths and parking areas.

Partition

To divide an area or tract of land into two (2) or three (3) parcels within a calendar year when such area or tract of land exists as a unit or contiguous units of land under single ownership at the beginning of such year. See the Stayton Municipal Code.

Peak Hour Demand

The maximum volume of water delivered to, or from the system, in any single hour of the year.

Peak Run-off

The maximum stormwater runoff rate determined for the design storm or design rainfall intensity.

Peat

A soil composed primarily of vegetative matter in various stages of decomposition, usually with an organic odor, dark brown to black color, and a spongy consistency.

Performance Bond

The approved security furnished by the Contractor's Surety as a guaranty of the Contractor's performance for the materials, equipment, and labor furnished to complete the Work.

Person

Individual firm, corporation, association, agency, or other entity.



Plans

The official construction plans or drawings, which may include some or all of the following: profiles, cross sections, elevations, details, and other working, supplementary, and detail drawings, or reproductions thereof, that shows the location, character, dimensions, and details of the Work to be performed. The construction plans for privately financed public improvements are not deemed “official” or “approved” unless stamped and signed by the Design Engineer and marked approved by the City Engineer or Public Works Director. For publicly funded public works improvement projects, construction plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets and are a part of the Contract Documents, regardless of the method of binding. Synonymous with the term Drawings.

Post-Developed Condition

The site conditions as they exist after development in terms of topography, vegetation, land use, and rate, volume, or direction of runoff.

Potable Water

Water that is satisfactory for drinking, culinary, and domestic purposes and meets the requirements of the health authority having jurisdiction.

Pre-Developed Condition

The site conditions as they exist prior to development in terms of topography, vegetation, land use, and rate, volume, or direction of runoff. Pre-Developed Conditions as it relates to stormwater calculations shall be as approved by the City Engineer.

Preliminary Review

Review of the construction plans by the City Engineer as outlined in these standards. All City Engineer comments and provisions of these Design Standards must be addressed prior to final review and approval for construction.

Private Collection System

A privately owned and maintained lateral sanitary sewer system installed to serve multi-unit structures on single ownership properties that cannot legally be further divided.

Private Distribution System

A privately-owned and maintained water distribution system serving an industrial or commercial subdivision or a multi-building development on a single lot served through a master meter and backflow prevention assembly installed at an approved location.

Private Road or Street

Any roadway for vehicular travel which is privately owned and maintained and which provides the principal means of access to abutting properties.

Private Service

That part of each property's utility service line that is on private property outside of any public rights-of-way or easements.

Private Storm Drain

A privately owned and maintained storm drain system located outside the building envelope which serves one or multiple building storm drains, catch basins, area drains, or other drainage facilities on private property outside of public easements and rights-of-way.



Project

General term encompassing all phases of the work to be performed under the Contract and is synonymous with the term Improvements or Work.

Projected Maximum Daily Demand

The maximum volume of water anticipated to be delivered to the system in a future single-day of a year divided by one (1) day.

Project Site

The geographical area of the real property on which the Work is to be performed, including designated contiguous staging areas.

Pronouns (Use Of)

As used herein, the singular shall include the plural and the plural the singular; any masculine pronoun shall include the feminine or neuter gender; and the term "person" includes natural person or persons, firm, co-partnership, corporation, or association, or combination thereof.

Public Storm Drain

Any storm drain in public right-of-way or easement operated and maintained by the City.

Public System

Any street, water, sanitary sewer, storm drain, or other public infrastructure in public right-of-way or easement operated and maintained by the City.

Public Traffic

Vehicular or pedestrian movement not associated with the Work, on a public way.

Public Works Director

The person employed or designated by the City as responsible for implementing policy and administrative issues related to the City of Stayton Public Works. The Public Works Director will also direct and coordinate engineering activities relating to the City of Stayton Public Works if also a registered professional engineer licensed to practice in the State of Oregon.. The Public Works Director will coordinate with the City Engineer with regard to issues involving technical and engineering aspects or decisions as deemed appropriate by the Public Works Director.

Public Works Standards

The Public Works Standards adopted by the City of Stayton and containing Design Standards, Standard Construction Specifications, Standard Drawings, and Standard Forms.

Public Works Superintendent

The superintendent for the Wastewater, Water, Stormwater, or Streets divisions of the City of Stayton's Public Works Department, authorized by the Public Works Director, who oversees and performs the administrative, supervisory, and technical work for their respective division.

Railroad

Publicly or privately owned rail carriers, including passenger, freight, and commuter rail carriers, their tenants, and licensees. Also, Utilities that jointly own or use such facilities.

Receiving Bodies of Water

Creeks, streams, lakes, and other bodies of water into which waters are artificially or naturally directed.



Record Drawings

Construction plans signed and dated by the Design Engineer indicating that the plans have been reviewed and revised, if necessary, to accurately show all as-built construction. Also referred to as As-Builts.

Redevelopment

Any development that requires demolition or complete removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding, repaving (where all pavement is not removed), and reroofing are not considered to be redevelopment. Interior remodeling projects and tenant improvements are also not considered to be redevelopment. Utility trenches in streets are also not considered to be redevelopment. Redevelopment within the City of Stayton is regulated as Development.

Reduced Pressure Principle Backflow Prevention Device (RPBD)

A device for preventing backflow which has two check valves, a differential relief valve located between the two check valves, two shut-off valves, one on the upstream side and the other on the downstream side of the check valves, and four test cocks for checking the water tightness of the check valves and the operation of the relief valve.

Reference Specifications

Bulletins, standards, rules, methods of analysis or test, codes and specifications of other agencies, Engineering societies, or industrial associations referred to in the Contract Documents. All such references specified herein refer to the latest edition thereof, including any amendments, updates, or new editions thereto which are in effect and published at the time of the Invitation to Bid for a publicly financed public improvements or date of development application for privately financed public improvements.

Release Rate

The controlled rate of release of drainage, storm, and runoff water from property, storage pond, runoff detention pond, or other facility during and following a storm event.

Residential Street

See Local Street.

Residential User

The owner, lessee, or occupant of a single dwelling unit in one structure.

Retention

The process of collecting and holding surface and stormwater runoff with no surface outflow from a developed property.

Right-of-Way (R/W or ROW)

A general term denoting public land, property, or interest therein, acquired for or devoted to a public street, public utility, public access or public use. Typically, the area between boundary lines of a street.

Roads

See Streets.

Roadbed

Completed excavations and embankments for the Subgrade, including ditches, side slopes, and slope rounding, if any.



Roadside

The area between the outside edges of the Shoulders and the Right-of-Way boundaries. Unpaved Median areas between inside Shoulders of divided Highways and infield areas of interchanges are included.

Roadway

That portion of a Highway or Street and its appurtenances between curbs, gutters, or ditches, improved, designed, or ordinarily used for vehicular travel. If a highway or street includes two or more separate Roadways, the term "Roadway" refers to any such Roadway separately, but not to all such Roadways collectively. (See Traveled Way.)

Rock

Natural deposit of solid material composed of one or more minerals occurring in large masses or fragments.

Sand

Particles of Rock that will pass a No. 4 sieve and be retained on a No. 200 sieve.

Sanitary Sewer System

The Sanitary Sewer System shall include all interceptors, mainlines, service laterals, force mains, pump stations, manholes, cleanouts, and related facilities, all of which are located within dedicated public Right-of-Way or easements and all of which are owned, operated, and maintained by the City. Overall, that public infrastructure maintained and operated by the City for collecting, pumping, and conveying domestic sewer and industrial waste.

Sedimentation

Deposition of erosional debris soil sediment transported by water.

Sewer Basin

Sanitary sewer drainage basins and service areas for the City of Stayton, as defined in the Wastewater Facility Plan.

Sewer Service Lateral

That part of each property's sanitary sewer service line which extends from the public main to the limit of the public right of way. For sanitary sewer mainlines located within easements, the limit of the sewer lateral will be the edge of a sanitary sewer easement.

Shall

An auxiliary word used to express a command which describes a specific requirement or course of action that is required of the Contractor and/or Design Engineer.

Shoulder

The part of a Roadbed contiguous to the Traveled Way or Roadway, whether paved or unpaved, for accommodating stopped vehicles, for emergency use and for lateral support of Base and surface Courses. Term applies to uncurbed streets and roads.

Shown

As used herein, the word "shown", or "as shown", shall be understood to refer to work shown on the Plans or in the Contract Documents.

Sidewalk

A path along the side of a road designated for pedestrians and sometimes for the use of non-motorized vehicles.



Sidewalk Ramp

A short ramp cutting through a curb or built up to it. A sidewalk ramp provides an accessible route that people with disabilities can use to safely transition from a roadway to a curbed sidewalk and vice versa.

Sight Distance Triangle

The distance from an intersection of a public or private road to the nearest access connection, measured from the closest edge of the pavement of the intersecting road to the closest edge of the pavement of the connection along the traveled way. The intersection and driveway sight distance is measured from an eye height of 3.5 feet above the controlled road at least 15 feet from the edge of the vehicle travel lane of the uncontrolled public road to an object height of 4.25 feet on the uncontrolled public road. For driveways along local access roads in urban and residential areas, the sight distance triangle is measured along the property lines of the street and along the driveway.

Silt

Soil passing a No. 200 sieve that is non-plastic or exhibits very low plasticity.

Single Course Construction

A wearing course only, not including patching or Leveling Courses or partial width Base Course.

Single Family Dwelling

Any residential building designed to house one family.

Slope

Vertical distance to horizontal distance, unless otherwise specified.

Soil

Accumulations of particles produced by the disintegration of Rock, which sometimes contains organic matter. Particles may vary in size from Clay to Boulders.

Specified

As used herein, the word "specified", or "as specified", means as required by the Contract.

Standard Construction Specifications

The terms, directions, and provisions set forth which contain construction materials and workmanship requirements included herein and included as a permanent part of the Public Works Standards. Synonymous with the term Specifications or Standard Specifications.

Standard Drawings

Detailed representation of structures, devices, or instructions as set forth in the Public Works Standards as adopted by City as a standard. Synonymous with the term Standard Plans or Standard Details.

State

The State of Oregon.

State of Oregon Plumbing Specialty Code

The State of Oregon Plumbing Specialty Code adopted by the International Association of Plumbing and Mechanical Officials (current edition) as revised by the State of Oregon and called the "Oregon Plumbing Specialty Code".



Station

A distance of one-hundred (100) feet measured horizontally along the established centerline of a street, sewer, or other work, unless specified otherwise.

Stormwater Management Facility

A technique used to reduce pollutants from, detain and/or retain, or provide a discharge point for stormwater to best preserve or mimic the natural hydrologic cycle, and/or to fit within or improve the capacity of existing infrastructure.

Stormwater Quality Facility

A stormwater management facility that has a primary purpose of improving water quality. This includes any structure, landscape, or drainage device that is designed, constructed, and maintained to collect and filter, retain, or detain surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality, as further outlined in the most current edition of the City of Portland Stormwater Management Manual.

Stormwater Quantity Facility

A stormwater management facility with a primary purpose of controlling stormwater flow to the City's waterways. This includes any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development quantity leaving the site, as further outlined in the most current edition of the City of Portland Stormwater Management Manual.

Stormwater Sump

A drainage facility (or system), also called "underground injection control", designed to utilize the infiltration capability of the ground, commonly referred to as percolation, to return surface and stormwater to the soil.

Street

Any street, avenue, boulevard, alley, lane, bridge, road, public thoroughfare or public way and any land over which a right-of-way has been obtained or granted for any purpose of public travel. The City has the following designated streets:

- ❖ **Major Arterial**
Principal Arterials typically have limited access and higher traffic speeds than other facilities except when traveling through a downtown area. Principal Arterials are usually served by other arterials. Arterial streets are identified in the City of Stayton Transportation System Plan.
- ❖ **Minor Arterial**
A street that collects and distributes traffic from the principal arterials to streets of lower functional classifications providing for movement within specific areas of the city. Minor arterials service through traffic and provide direct access for commercial, industrial, office, and multi-family development but, generally not for single family residential properties. The minor arterial streets are identified in the Stayton Transportation System Plan.
- ❖ **Collectors**
Collector roadways facilitate the movement of city traffic within the urban area. Collectors provide some degree of access to adjacent properties, while maintaining circulation and mobility for all users. Collectors can be two or three-lane facilities and are used to connect the various roadways of an urban area, although they are designed to carry lower traffic volumes at lower speeds than arterials.



❖ **Neighborhood Collectors**

Neighborhood Collectors connect neighborhoods with collectors and arterials, facilitate the movement of local traffic and provide access to abutting land uses. Speed on these facilities should remain low to ensure community livability and safety for pedestrians and bicyclists of all ages. On-street parking is more prevalent and pedestrian amenities are typically provided on these roadways. Striped bike lanes are unnecessary for most neighborhood collectors because the traffic volumes and speeds should allow cyclists to share the road with the motorists.

❖ **Commercial, Industrial, Residential Local**

The goal of Local Streets is to provide access to adjacent land uses. These streets offer the lowest level of mobility and consequently tend to be short, low-speed facilities. The local streets within Stayton can be split into three categories: Industrial, Commercial, and Residential Local roadways, with all three categories providing access to their respective land uses.

❖ **Cul-De-Sac**

A short, dead-end street with a circular vehicular turn-around at the dead-end.

❖ **Dead-End Street**

A street or series of streets that can be accessed from only one point. Dead-end streets can be either temporary (intended for future extension as part of a future street plan) or permanent. Permanent dead-end streets must provide adequate turn-around capability.

❖ **Partial-Width Street**

A portion of the ultimate width of a street, usually along the edge of a subdivision where the remaining portion of the street shall be provided when adjacent property is subdivided. See also PWDS Section 303.

❖ **Three-Quarter Street**

A partial-width street with at least 3/4 of the standard street classification width. Where a 3/4-street improvement is required, the right-of-way and pavement width requirements will be as determined by the City Engineer. See also PWDS Section 303.

❖ **Half-Street**

A partial-width street with at least 1/2 of the standard street classification width. A development with frontage improvements required on an existing substandard street will be responsible for constructing a continuous 1/2-street improvement, unless otherwise directed by the City Engineer. See also PWDS Section 303.

Street Cut

Any cut of any pavement, including street pavement, curb, curb-and-gutter, sidewalk, driveway, or other pavement in a street, alley, bikeway, or other improvement, in a public right-of-way, easement or property preparatory to excavating. Synonymous with the term Pavement Cut.

Street Tree

A street tree is defined as a living, woody plant typically having a single trunk of at least 1.5 inches in diameter at a point 4 feet above mean ground level at the base of the trunk that is located in the public right-of-way.



Structures

Bridges, retaining walls, endwalls, cribbing, buildings, culverts, manholes, catch basins, drop inlets, sewers, service pipes, underdrains, foundation drains, and other similar features which may be encountered or constructed in the Work.

Subbase

A Course of specified material of specified thickness between the Subgrade and a Base.

Subcontractor

An Entity having a direct contract with the Contractor or another Subcontractor, at any tier, to perform a portion of the Work.

Subdivision

To partition a parcel of land into four (4) or more parcels for the purpose of transfer of ownership or building development, either immediate or future, when such a parcel exists as a unit or contiguous units under a single ownership as shown on the tax roll of year preceding the partitioning, or has existed as a unit or contiguous units under a single ownership as shown on the tax roll for any year subsequent to the passage of the Stayton Municipal Code.

Subgrade

The top surface of completed earthwork on which subbase, base, surfacing, pavement, or a course of other material is to be placed.

Substantial Completion

The Work (or a specified part thereof) has progressed to the point where, in the opinion of the City Engineer, it is sufficiently complete in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended.

Substructure

Those parts of a structure which support the superstructure, including bents, piers, abutments, and integrally built wingwalls, up to the surfaces on which bearing devices rest. Substructure also includes portions above bearing surfaces when those portions are built integrally with a substructure unit (e.g., backwalls of abutments). When substructure and superstructure elements are built integrally, the division between substructure and superstructure is considered to be at the bottom soffit of the longitudinal or transverse beam, whichever is lower. Culverts and rigid frames are considered to be entirely Substructure.

Subsurface Infiltration

The percolation of water into the ground through a subsurface fluid distribution system or underground injection control (UIC) system. Subsurface infiltration systems are generally regulated by DEQ under existing UIC rules.

Superintendent

The authorized representative of the Contractor who is responsible for continuous field supervision, coordination, and completion of the Work and is authorized to receive and fulfill instructions from the City Engineer.

Superstructure

Those parts of a Structure above the Substructure, including bearing devices.

Supplemental Agreements

Agreements made between the City and other governmental agencies, utility companies, or other entities that are included in the Contract Documents and affect some aspect of the work.



Surety

The corporate body which is bound with and for the Contractor, for the acceptable performance of the Contract, and for the payment of all obligations arising out of the Contract Documents. Surety shall be licensed to conduct the business of surety in the State of Oregon and named in the current list of approved sureties published by the U. S. Treasury Circular 570.

Surface Infiltration

The percolation of water into the ground through an open-surfaced stormwater management facility. Surface infiltration systems need to be verified by the Design Engineer whether or not the open-surfaced stormwater management facility is regulated by DEQ under existing UIC rules.

Surfacing

The course or courses of material on the Traveled Way, auxiliary lanes, Shoulders, or parking areas for vehicle use.

Surveyor

A registered professional licensed to practice surveying in the State of Oregon having special knowledge of the principals of mathematics, the related physical and applied sciences, and the relevant requirements of law, who is or will be responsible for surveying of the Project.

Swale

A broad-bottomed, shallow, vegetation-lined channel that allows for reduced flow velocity and filtration of stormwater, generally with flow depths less than 1-foot.

Terrace

A relatively level step constructed in the face of a grade surface for drainage, erosion control, and maintenance purposes.

Ton

One short ton of 2,000 pounds (Ton, ton, Tn, or T).

Topsoil

Soil ready for use in a planting bed.

Traffic Lane

That part of the Traveled Way marked for moving a single line of vehicles.

Trail

A pathway designed to provide walking, (and sometimes bicycling), equestrian and other non-motorized recreational and transportation opportunities.

Transverse Joint

An interface between two adjacent asphalt or concrete mats, which in regards to surfacing of roadways, typically follows a course approximately perpendicular to the centerline of the roadway.

Traveled Way

That portion of the Roadway for the movement of vehicles, exclusive of shoulder, auxiliary lanes, berms, and Shoulders.

Treatment Volume

The storage volume necessary to provide the required level of water quality treatment of stormwater prior to discharge to a storm drain element, facility, or natural drainage element.



Trunk Sewer

A sanitary sewer pipe that is primarily intended to receive sanitary sewer from collector pipes, other trunk sewers, existing major discharges of raw or inadequately treated sanitary sewer, or water pollution control facilities.

Trunk Storm Drain System

The portions of the storm drain system of the City which receives waters from an adjacent land area in excess of 20 acres. The trunk storm drain system may consist of watercourses or man-made facilities such as pipes, ditches, and culverts.

Turnaround Area

A paved area of sufficient size and configuration that a motor vehicle may maneuver so as to travel in the opposite direction.

Typical Section

That Cross Section established by the Plans or the 3D Engineered Model which represents in general the lines to which the Contractor shall work in the performance of the Contract.

Underground Injection Control (UIC)

Any system, structure, or activity that is intended to discharge fluids below the ground surface and classified by the Oregon Department of Environmental Quality (DEQ) as an underground injection system (UIC). UICs are regulated by DEQ to limit and control injection of wastes into the subsurface to protect existing groundwater quality for current and future beneficial uses including use as a source for drinking water.

Unsuitable Material

Frozen material, or material that contains organic matter, muck, humus, Peat, sticks, debris, chemicals, toxic matter, or other deleterious materials not normally suitable for use in earthwork.

Utility

Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, owned, operated or maintained, typically within or across a public right-of-way or easement. A line, facility, or system for producing, transmitting, or distributing communications, power, electricity, heat, gas, oil, water, steam, waste, storm water, or any other similar commodity which directly or indirectly serves the public. The term may also mean the utility company, district, or cooperative owning and operating such facilities, including any wholly-owned or controlled subsidiary.

Warranty

The Contractor's responsibility to the City for the repair or replacement of defective materials and/or workmanship relative to the work or a portion or a component part thereof.

Warranty Bond

The approved security furnished by the Contractor's Surety as a guaranty of the Contractor's performance of its warranty obligations.

Wastewater

See Sanitary Sewer.

Water Distribution System

Water distribution pipelines, pumping stations, reservoirs, valves, and ancillary equipment used to transmit water from the supply source to the service line.



Water Demand

The total quantity of water supplied for a given period of time to meet the various required uses. The various uses include residential, irrigation, commercial, and industrial uses as well as fire fighting, system losses, other unaccounted for, and miscellaneous uses.

Water Main

The water-supply pipe for public or community use.

Water Service Line, Public

The pipe connection from the City water main to the metering device or backflow prevention assembly.

Waterway

A surface water route consisting of a channel having a defined bed, banks, and/or sides in which surface water flows, draining from higher to lower elevations. May also refer to a closed pipe system or bridge structure under limited circumstances.

Wet Weather Construction Season

Defined for the purposes of construction and development in the City as the period between October 1st and the following May 31st. The Wet Weather Construction Season is not to be confused with the wet weather period typically used for calculating current or prevailing sewage flow rates.

Wetlands

An area inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and which, under normal circumstances, does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are considered to be part of the watercourse and drainage system of the City. Wetlands generally include swamps, marshes, bogs, and similar areas, but also include seasonally wet meadows, farmed wetlands and other areas that may not appear “wet” all the time. They may be, but are not necessarily, characterized by special soils such as peat, muck, and mud.

Wetland Protection Area

An area subject to the provisions of Title 17 of the Stayton Municipal Code that includes all Wetlands determined to be locally significant.

Will

Used in the Standards as an auxiliary verb to express a determination to meet a specific requirement or to take a specific course of action or to describe the inevitable.

Work

All materials, labor, tools, equipment and, incidentals necessary to successfully complete any individual item or, if the context requires, the entire Project including the successful completion of all duties and obligations imposed by the Contract Documents and/or plans and specifications.

Working Day

Calendar day, any and every day shown on the calendar, excluding Saturdays, Sundays and Legal Holidays.

Written Notice

See Notice.



101.11 ACRONYMS AND ABBREVIATIONS

Meanings of acronyms and abbreviations commonly used in these Design Standards, Standard Drawings, on the Plans, and other related documents are as follows:

AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ABA	Architectural Barriers Act
ABC	Associated Builders and Contractors, Inc.
AC	Asphalt Concrete
ACI	American Concrete Institute
ACP	American Concrete Pavement
ACWS	Asphalt Concrete Wearing Surface
ADA	Americans with Disabilities Act
AGA	American Gas Association
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	Engineered Wood Association
APWA	American Public Works Association
ARA	American Railway Association
AREMA	American Railway Engineering and Maintenance of Right-of-Way Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATPB	Asphalt-Treated Permeable Base
AWG	American Wire Gauge
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association
CAgT	Certified Aggregate Technician
CAT-I	Certified Asphalt Technician I
CAT-II	Certified Asphalt Technician II
CBM	Certified Ballast Manufacturers
CCO	Contract Change Order
CCT	Concrete Control Technician
CDT	Certified Density Technician
CEBT	Certified Embankment and Base Technician
CF	Cubic Feet/Foot
CFR	Code of Federal Regulations
CMDT	Certified Mixture Design Technician
CPF	Composite Pay Factor
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard, Commodity Standards Division, U.S. Department of Commerce
CY	Cubic Yard
D1.1	Structural Welding Code - Steel, American Welding Society, current edition
D1.5	Bridge Welding Code, American Welding Society, current edition
DBE	Disadvantaged Business Enterprise
DEQ	Department of Environmental Quality, State of Oregon
DOGAMI	Department of Geology and Mineral Industries, State of Oregon



DSL	Department of State Lands, State of Oregon
DMR	Design Modification Request
EA	Each
EAC	Emulsified Asphalt Concrete
EPA	U.S. Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
FHWA	Federal Highway Administration, U.S. Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration
GSA	General Services Administration
HMAC	Hot Mixed Asphalt Concrete
ICEA	Insulated Cable Engineers Association (formerly IPCEA)
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
ISO	International Standards Organization
ITE	Institute of Traffic Engineers
JMF	Job Mix Formula
LF	Lineal Feet/Foot
LS	Lump sum
MFTP	(ODOT) Manual of Field Test Procedures
MIL	Military Specifications
MSC	Minor Structure Concrete
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways,
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NESC	National Electrical Safety Code
NIST	National Institute of Standards and Technology
NPDES	National Pollutant Discharge Elimination System
NPS	Nominal Pipe Size (dimensionless)
NLMA	National Lumber Manufacturer's Association
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
OR-OSHA	Oregon Occupational Safety and Health Division of the Department of Consumer and Business Services
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor
PCA	Portland Cement Association
PCC	Portland Cement Concrete
PCI	Precast/Prestressed Concrete Institute
PCP	Pollution Control Plan
PF	Pay Factor of a constituent
PLS	Professional Land Surveyor
PMBB	Plant Mixed Bituminous Base
PTI	Post-Tensioning Institute
PUC	Public Utility Commission, State of Oregon
QA	Quality Assurance
QC	Quality Control
QCT	Quality Control Technician
QL	Quality Level
QPL	Qualified Products List
RAP	Reclaimed Asphalt Pavement
REA	Rural Electrification Administration, U.S. Department of Agriculture
RMA	Radio Manufacturers Association or Rubber Manufacturers Association



SAE	Society of Automotive Engineers
SDP	Site Development Permit
SF	Square Foot/Feet
SI	International System of Units
SY	Square Yard
SMC	Stayton Municipal Code
SRCM	Soil and Rock Classification Manual (ODOT)
SSPC	Steel Structures Painting Council
SWMM	Stormwater Management Manual (City of Portland)
T	Tolerances, AASHTO Test Method
TM	Test Method (ODOT)
TV	Target Value
UBC	Uniform Building Code (as adopted by the State of Oregon)
UL	Underwriters Laboratory, Inc.
UPC	Uniform Plumbing Code (as adopted by the State of Oregon)
USASI	United States of America Standards Institute
USC	United States Code
WAQTC	Western Alliance for Quality Transportation Construction
WCLIB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association



102 PUBLIC IMPROVEMENT DESIGN PROCEDURES AND REQUIREMENTS

102.01 PRE-APPLICATION CONFERENCE

102.01.A The City of Stayton will hold a pre-application conference with the applicant (Owner/Developer), unless otherwise waived by the Planning Director, before formal application for public works permits and review of site design and construction plans. The pre-application process allows the applicant and the City to discuss the proposed project and the standards and regulations that apply, while the project is still in a preliminary stage. Any specific development standards, regulations, or problem areas can thus be discussed before the applicant makes a substantial investment in the project or proceeds with a formal application unaware of the issues.

102.01.B Any pre-application conference preliminary discussion notes provided by the City to the Developer are public works related initial thoughts and comments based on a brief cursory review of the preliminary map/sketch included with the request for a pre-application conference and are intended to be for discussion purposes only. Any SMC, PWS, SWMM, and other Site Development Permit requirements that may be applicable to the proposed development, but not specifically referenced in the preliminary discussion notes, does not in any way relieve the Developer from their responsibility to comply with the requirements of the SMC, PWS, SWMM, and applicable permits, laws, and regulations at the time of development. Should the applicant decide to pursue continuation of the development, the preliminary discussion notes may be further incorporated into public works recommended conditions of approval.

102.02 PRE-DESIGN CONFERENCE

102.02.A The Developer is encouraged to meet with the Public Works Director and the City Engineer prior to final design of the proposed improvements. It shall be the Developer's responsibility to provide the City Engineer with base maps showing existing utilities and proposed improvements prior to the pre-design conference.

102.03 PRE-DESIGN SURVEY

102.03.A Licensed land surveyors are responsible for land surveying practiced under their supervision including conformance with all State statutes pertaining to survey and land laws. This includes, but not limited to, the following statutes:

- ❖ ORS 92 Subdivisions and Partitions
- ❖ ORS 93 Conveyancing and Recording
- ❖ ORS 209 County Surveyors
- ❖ ORS 672 Professional Engineers, Land Surveyors, Geologists

102.03.B All public improvement project designs shall be based on a complete design survey. All surveys shall comply with and ORS 209.140-150, which define the requirements for protection of existing survey monuments during any construction and setting new survey monuments following construction.

102.03.C All elevations on design plans and record drawings shall be based on NAVD88 Datum. Each page of the plans and drawings shall state the benchmark datum information.

102.03.D Horizontal datum shall be based on the Oregon State Plain Coordinate System (NAD 83).



102.03.E The design survey shall include, but not be limited to the following information:

- ❖ Surface features
- ❖ Subsurface features.
- ❖ Existing utilities (public and private).
- ❖ Property lines/monuments.
- ❖ Right-of-way lines & centerline monuments.

102.03.F See Subsection 201.04.D of the Design Standards for the required survey limits beyond the termination point of the proposed improvements.

102.04 ACCURACY OF CITY MAPS AND PLANS NOT GUARANTEED

102.04.A From time to time the City may provide property owners, engineers, Contractors, and other members of the public with information from the City's archives. The City cannot guarantee and makes no representation that it has verified the accuracy or completeness of the measurements, locations, or other information on such maps and plans.

102.05 PUBLIC WORKS IMPROVEMENTS DESIGN

102.05.A GENERAL

1. All public and private public works improvements within a private development shall be designed and constructed to the City of Stayton Public Works Standards plus the requirements of the Stayton Municipal Code. Prior to construction, the Developers' Design Engineer shall submit engineered construction plans for City Engineer or Public Works Department approval of all public improvements. All engineered construction plans must comply with the City of Stayton Public Works Standards, the Stayton Municipal Code, conditions of approval, and the requirements of the City Engineer in effect at the time the engineered plans are submitted.
2. All engineered design plans shall be prepared in accordance with the plan development requirements shown in Division 2 of these Design Standards.
3. The Design Engineer shall design the public improvements in accordance with standard engineering practices and applicable Divisions of these Design Standards.
 - a. Street and Alleys, including pedestrian and bicycle facilities, streetlights and signals, shall be designed in accordance with Division 3 or the Design Standards, the Standard Drawings, be in conformance with the approved tentative plat, City master planning and ordinances, applicable Oregon Revised Statutes and Oregon Administrative Rules, and others as noted in Division 3 of these Design Standards.
 - b. Water Distribution systems shall be designed in accordance with Division 4 of these Design Standards, the Standard Drawings, City master planning and ordinances, Oregon Department of Human Services-Drinking Water Programs, applicable Oregon Revised Statutes and Oregon Administrative Rules, and others as noted in Division 4 of these Design Standards.
 - c. Sanitary Sewer systems shall be designed in accordance with Division 5 of these Design Standards, the Standard Drawings, City master planning and ordinances, Oregon Department of Environmental Quality, applicable Oregon Revised Statutes and Oregon Administrative Rules, and others as noted in Division 5 of these Design Standards.



- d. Storm drains and other stormwater management facilities shall be designed in accordance with Division 6 of these Design Standards, the Standard Drawings, the City of Portland Stormwater Management Manual, City master planning and ordinances, Oregon Department of Environmental Quality, applicable Oregon Revised Statutes and Oregon Administrative Rules, and others as noted in Division 6 of these Design Standards.
 - e. Erosion and Sediment Control Plans shall be designed in accordance with Division 7 of these Design Standards, the Standard Drawings, ODOT Erosion Control Manual, Oregon Department of Environmental Quality, City municipal code and ordinances, applicable Oregon Revised Statutes and Oregon Administrative Rules, and others as noted in Division 7 of these Design Standards.
4. Where the Public Works Standards are silent, the ODOT Oregon Standards shall apply. If the work is in the Marion County right-of-way, then the Marion County Public Works Standards shall apply, unless otherwise directed by the City Engineer.
 5. The Developer shall be responsible for securing approval and permits from all County, State, and Federal agencies having jurisdiction over the Work. These agencies may include, but not limited to, Marion County, ODOT, DEQ, OHA-DWS, 1200-C or CN, DSL, Fire Code Official, Building Code Official, etc.

102.05.B STRUCTURES

1. GENERAL

- a. Structures in public rights-of-way and easements shall be designed, constructed, inspected and tested in accordance with the requirements of the ODOT and ACI, as applicable, and the additional or exclusionary requirements contained in these Design Standards. In cases of conflict or disagreement, the most stringent requirements among them, as determined by the City Engineer, shall take precedence. These requirements are contained in ODOT's Manual of Field Test Procedures, Bridge Design Manual and accompanying Standard Drawings, Oregon Standard Specifications for Construction and Oregon Standard Drawings, AASHTO's Roadside Design Guide, and AASHTO's Load and Resistance Factor Design (LRFD) Bridge Specifications, which are incorporated herein by reference. The latest editions of Oregon Structural Specialty Code (OSSC), the "ACI Manual of Concrete Practice," "ACI Manual of Concrete Inspection," and the "ACI Guide for Concrete Inspection," or other ACI codes, specifications, and guidelines, at the discretion of the City Engineer, shall govern those structures and characteristics of structures not addressed by the aforementioned standards.
- b. For purposes of these Design Standards, the following structures are not considered major structures: curb, curb and gutter, sidewalks, driveways, catch basins, street inlets and other drainage inlets connected to storm drain pipes 21-inches in diameter or smaller, manholes, and other structures shown in the Standard Drawings. These structures shall conform to the Public Works Standards and the ODOT Oregon Standard Specifications for Construction, as specifically referenced.
- c. Unless otherwise provided herein, major concrete and steel structures shall conform to the ODOT Oregon Standard Drawings. Major concrete structures not addressed by these Standards, and the characteristics of major concrete structures not fully addressed by these Standards, shall conform to the design criteria in the latest editions of the Oregon Structural Specialty Code (OSSC), the "ACI Manual of Concrete Practice," "ACI Manual of

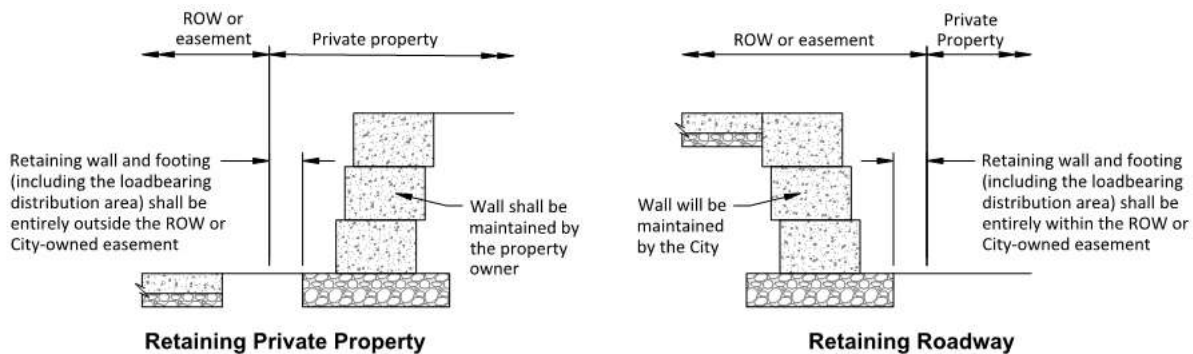


Concrete Inspection,” and the “ACI Guide for Concrete Inspection,” or other ACI codes, standards, specifications, and guidelines, at the discretion of the City Engineer.

2. RETAINING WALLS

- a. The term “retaining wall” as used in this section includes the wall face, structural backfill, geogrids, and other tie back systems, wall drainage systems, drainage backfill, and all other wall components required by the wall system manufacturer or Design Engineer to ensure the stability of the wall.
- b. Retaining walls exceeding four (4) feet in height (measured from the base of the foundation to the top of the wall) shall be designed by a registered Professional Engineer licensed to practice structural engineering in the State of Oregon. Walls less than 4 feet in height but supporting a surcharge load must also be designed by a registered Professional Engineer.
- c. It is the preference of the City that retaining walls designed to retain private property are not constructed within the public right-of-way.
- d. Roadside retaining walls shall be designed to avoid conflicts with the maintenance of utilities and their appurtenances. Utility lines shall not be located under retaining wall tie-backs. Water lines within ten (10) feet or less of thee tie-backs shall be encased in approved steel pipe casings.
- e. Retaining walls in public easements shall be designed for maintenance traffic loads in the easement at the top of the wall. The entity responsible for maintenance of each retaining wall and its subsurface drain piping shall be noted on subdivision plats, and/or in “Covenants, Conditions, & Restrictions” (CC&Rs), and/or in an easement agreement.
- f. A building permit may be required by the OSSC, Marion County Building department, and/or the City of Stayton depending upon the height and location of the wall. Retaining walls shall be designed by a professional civil or structural engineer in accordance with the OSSC design criteria.
- g. Retaining walls that exceed four (4) feet in height that do not require a building permit under the OSSC and/or Marion County Building department will be required to submit to the City the design calculations and plans for review and approval.
- h. Walls constructed to retain a roadway or other public infrastructure shall be located entirely within the ROW or City-owned easement. Walls constructed to retain private property shall be located entirely on the private property and shall be maintained by the property owner. See Figure 102.05.B.2.a for wall location and ownership.

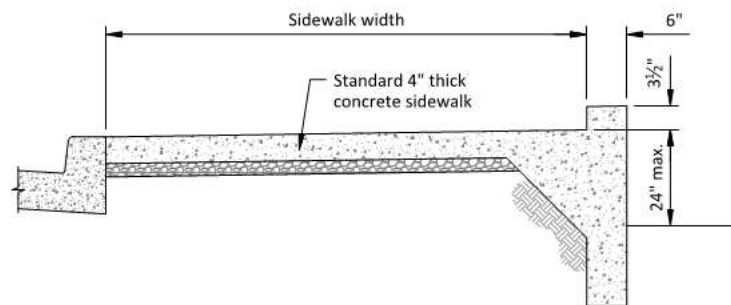
Figure 102.05.B.2a





- i. Retaining walls located near street intersections shall conform to the sight distance and sight clearance area requirements specified in Section 303.06.
- j. Retaining walls greater than 30 inches in height measured at grade two (2) feet from the face of the retaining wall, or as directed by the City Engineer, shall be provided with an approved handrail or fence on top conforming to the applicable ODOT standards as determined by the City Engineer.
- k. Retaining walls less than 24 inches in height located at the back of a proposed sidewalk shall include a minimum 3-1/2 inch tall “kicker” as shown in Figure 102.05.B.2.b.

Figure 102.05.B.2.b



102.06 FUTURE DEVELOPMENT

- 102.06.A** Wherever a proposed development abuts unplatted, developable land or a future development phase of the same development, street stubs shall be provided to provide access to abutting properties or to logically extend the street system into the surrounding area. Developers shall construct roadways within their development site to conform to the Future Street Plan and Roadway Functional Classification Map in the Transportation System Plan. Flexibility of the future roadway alignment shall be at the discretion of the Public Works Director and/or his designee but must maintain the intent of the Future Street Plan. Where existing street improvements do not extend to the proposed development or the existing streets to the proposed development are not adequate to serve the development, the Developer may be required to improve the streets to the development.
- 102.06.B** Storm drainage and sanitary sewer systems shall be designed for the ultimate development density of the entire contributing area based on current and on proposed land use designations consistent with the PWDS and City master plans. The Storm drainage and sanitary sewer systems shall extend to the most distant parcel boundary and be designed at a size and grade to facilitate future extension to serve development of the entire contributing area.
- 102.06.C** Water system design shall meet the distribution needs for projected maximum daily demand within the service area and shall allow for future extensions beyond present development that are consistent with the PWDS and Water Master Plan. Water systems shall be designed at a size according to the current zoning area fire flow needs, velocity, standards, and water modeling determinations. Water systems shall be looped so as to avoid dead ends.



102.06.D Where new public utilities are being designed for installation parallel to existing public utilities, the vertical location shall be in such a manner that will permit future lateral or service connections and avoid conflicts with parallel utilities without abrupt changes in vertical grade. Where existing public utility lines do not adjoin the proposed development or the capacity of existing lines is inadequate, the Developer will be required to extend new utility lines to the development as necessary and extend them to provide for service to adjacent properties.

102.06.E The City may require oversizing of a public improvement to serve future development in accordance with applicable master plans, or as deemed necessary by the City. In the event that larger public improvements are deemed necessary by the City for service to adjoining areas than what would normally be required to serve the area to be developed, the City and the Developer shall enter into an agreement that specifies what, if any costs, the City will reimburse the Developer for the oversizing as further outlined in SMC 17.24.050.12 and SMC 13.12.

102.06.F In accordance with SMC 17.24.040.3.x, a future development plan is required to be submitted to the City when it is evident that the property to be divided can be further divided or provides street or utility connections to adjacent property. The future development plan shall be submitted at the same time that the preliminary plan is submitted to the City, and shall contain the following information:

- ❖ Any potential future lots (lot size shall be depicted).
- ❖ Existing and proposed utilities including water, sewer, and storm drains.
- ❖ Streets and access points for potential future lots.

102.07 UTILITY LOCATIONS

102.07.A Public utilities shall be located in public right-of-way as indicated in the Standard Drawings. Any deviations will be reviewed on a case-by-case basis and will require City approval.

102.07.B Private utilities shall not be located within a common utility trench with water, sanitary sewer or storm drainage systems. Public and private utilities shall maintain a minimum of 5-feet of horizontal separation except at crossings. All sanitary sewer and waterline separation distances shall comply with applicable OHA-DWS and DEQ requirements.

102.07.C All franchise utility improvements, including but not limited to, telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as Public Works Standards. All franchise utilities shall be located with the 10' PUE and utility plans shall be submitted to the City for review and approval prior to construction. Any franchise utilities proposing to install major franchise utility systems within public right-of-way to serve future development of the adjoining area and which cannot be relocated in the future, will be required to prepare and submit to the City detailed drawings showing how the proposed systems can be installed within the public right-of-way without conflicting with existing or proposed public utilities. The submittal to the City may be required to include, but not be limited to, plan and profiles of the proposed systems based on a detailed topographic survey.

102.08 ACCESS AND UTILITY EASEMENTS

102.08.A Where an access and utility easement is needed, the following guidelines and requirements will govern the requirements for, and the use of, access and utility easements:

1. Easements will only be permitted when it has been shown to be impractical or unfeasible to locate the needed public improvement within the public right-of-way. Utilities in the right-of-way



shall be located as shown in the Standard Drawings. Easements require specific approval of the City Engineer.

2. All easements shall be exclusive to a single City utility unless otherwise approved by the City Engineer.
3. The conditions of the easement shall be such that the easement shall not be used for any purpose that would interfere with the unrestricted operation and maintenance of the utility. Under no circumstances shall a building or any other structure be placed over a utility or utility easement. This shall include overhanging structures with footings located outside the easement. See the City of Stayton's easement form for additional information.
4. No trees or landscape features that are large or heavy shall be planted within the easement that could make operation of maintenance equipment difficult. Small shrubs, grass, bark mulch, or gravel may be used on easements. Fences shall not be installed within the easement, unless otherwise approved by the City Engineer.
5. Public and/or private utilities located on private property shall be located at the center of a permanent easement. The easement for a single utility shall be 15-feet in width and 20-feet in width for two (2) utility lines. If two (2) or more utilities are located within the same easement, the easement width shall be increased based on the separation distance between the lines. Any variation in easement widths shall vary in 5-foot increments.
6. If a utility is deeper than 10-feet or has a diameter greater than 24-inches, a wider easement may be required. In such cases, a slope of one horizontal to one vertical from the bottom of the pipe will be used to determine the width of the easement, after taking into account the width of the pipe trench itself.
7. At the terminus of all public lines, the easement shall be extended a minimum of 10-feet past the end of the line, manhole, or cleanout.
8. Easements shall be granted to the City on Standard Forms provided by the City, unless otherwise approved. Easements shall consist of three (3) separate 8.5 by 11-inch exhibits as follows:
 - a. Exhibit A shall provide the easement's legal description, as prepared by a registered Oregon professional land surveyor.
 - b. Exhibit B shall provide a sketch (site and vicinity survey drawing) of the final easement configuration, also prepared by a registered Oregon professional land surveyor.
 - c. Exhibit C shall provide an Ownership Disclosure and Affidavit, if determined by the City to be necessary.
9. Public easements within master planned developments, manufactured home parks, apartment complexes, or commercial/industrial developments shall be located in parking lots, private drives, or similar open areas that permit unobstructed vehicle access for maintenance and inspection purposes.
10. Except with approval of the City Engineer, easements shall be placed on a single property, not centered on property lines. The utility shall be centered in the easement. If an easement centered along a property line is approved by the City Engineer, the utility shall be offset 18-inches clear from the property line.



11. Easements shall be furnished to the City for review and approval prior to recording. All easements shall be according to the City's standards.
 12. Easement location, purpose, width, and description shall be shown on the City-approved Plans.
 13. Costs for mailing, processing, recording, etc. of easements created by private development shall be borne by the Developer, unless specifically agreed to by the City.
- 102.08.B** When required by the Stayton Municipal Code and/or as directed by the City Engineer, a 10-foot wide public utility easement (PUE) shall be provided for electrical, telephone, cable, gas and other franchise utilities. See Standard Drawings for typical underground utility locations.

102.09 PLAN REVIEW SUBMITTAL REQUIREMENTS

- 102.09.A** Engineered construction plans for all public works improvements (including privately financed public improvements) shall be submitted to the Public Works Department. The Public Works Department will coordinate the plan review with the City Engineer. The City's review of the public works improvements is for general conformance with applicable public works portions of the City of Stayton Municipal Code (SMC), Public Works Design Standards (PWDS), and any relative master plans. The City's review does not include a review of any other agencies requirements or permits, or any architectural, structural, or building designs covered under any building, plumbing, mechanical, electrical, fire, or other building codes/permits/regulations. The Developer will be required to obtain any and all required reviews and permits required by the Planning Conditions of Approval, SMC, PWDS, Marion County Building Department, Marion County Public Works, Fire Code Official, Building Code Official, DEQ, OHA-DWS, DSL, and/or any other agencies having jurisdiction over the work. The Developer shall coordinate with the City, Fire Code Official, Building Code Official, and/or other agencies as necessary.
- 102.09.B** Plan submittals shall include the plan development information required in Division 2 of these Design Standards along with all other project information requested by the City Engineer. This information is to include, but not be limited to, Design Engineer's construction cost estimates, easement documents, right-of-way dedications, executed agreements, and a plan check and inspection fee. All submittals will be reviewed by the City for completeness and the Design Engineer will be notified if any required information is missing. Incomplete submittals will be returned without review. Submittals should be made in a timely manner, as lack of information to the City may impede the review process. Various checklists have been prepared to assist the Design Engineer with providing the City with complete submittals.
- 102.09.C** One (1) electronic file set shall be submitted with the permit application to the City for preliminary review for all Site Development Permit applications, unless required otherwise by the City Engineer.
- 102.09.D** A plan check fee must be paid before a plan review will be initiated. The amount of the fee will be established by resolution of the City Council.
- 102.09.E** Once a complete application, construction plans, and other supporting documentation has been received, the City will perform a preliminary review of the submittal and will return either one (1) set of red-lined construction plans or review memorandum outlining any required revisions. The applicant's Design Engineer shall provide with the re-submittal a copy of the review memorandum, or provide a separate response memo, with the appropriate responses addressing each review comment from the prior review. Responses to each review comment from the prior review is required with re-submittals in order to be entitled to further reviews by the City. All submittals and responses to comments must appear throughout to be a genuine attempt to address each review comment and provide a complete set of construction plans. Once the review comments have been



adequately addressed, then the revised construction plans and other supporting documentation can be re-submitted as an electronic set of the revised submittal..

- 102.09.F** Once the review comments have been adequately addressed, the Developer shall circulate the construction plans to all franchise utility service companies within the City and all other outside agencies having jurisdiction over the work as required for the development.
- 102.09.G** All required approvals from other outside agencies having jurisdiction over the work must also be received prior to receiving final plan approval from the City, including but not limited to the Oregon Health Authority – Drinking Water Services (OHA-DWS), Department of Environmental Quality (DEQ), Oregon Department of Transportation (ODOT), Marion County, Fire Code Official, and railroads wherein each has jurisdiction. The Developer is responsible for the coordination with the various utilities and agencies during design and construction. See Appendix B for list of utilities and agencies. . All proposed drawings from franchise utilities must be received and approved by the City prior to construction.
- 102.09.H** Upon receiving conditional plan approval by the City, five (5) original complete full size hard copy sets and one (1) electronic file set of the final construction plans shall be submitted to the City to be signed and stamped approved for construction. The final approved construction plans will have the City Engineer or Public Work Director's signature and date within the approval block on the cover sheet and an approved stamp (or similar acknowledgement) on the remaining plan sheets. Final approved construction plan sets will be kept by the City Public Works Director, the City Engineer, the City Inspector, the Developer, and the Design Engineer.
- 102.09.I** Prior to City issuance of any public works permits, the Developer shall provide the City with the following:
1. Copy of an approved Development Agreement signed by the Developer and notarized. Any reimbursement per the Development Agreement shall be established by the tabulation of bids for the actual cost of construction, or other method approved by the City Engineer.
 2. Other supporting documentation and submittals specific to the project, including plan approvals from other applicable agencies having jurisdiction over the work.
 3. Copy of an approved Stormwater Management Facility Operations and Maintenance Plan and Agreement.
 4. Any required Construction Deferral and Waiver of Rights of Remonstrance Agreements.
 5. Recorded copies of all required easements and right-of-way dedications. Off-site easements shall be recorded and delivered to the City prior to issuance of a public works permit for that work. For subdivisions or partitions where all public utilities will be constructed prior to the recording of a final plat, the execution and recording of the easement documents and right-of-way dedications can be done in conjunction with the final plat. All easements documents shall use the City's standard form and shall include an exhibit map in addition to any legal descriptions. Legal descriptions and exhibit maps shall be submitted for City review and approval prior to recording.
 6. Any required permit fees.
 7. Proposed Construction Schedule
 8. Contractor's Indemnity Agreement



9. Certificates of insurance, with minimum insurance limits as outlined in the Standard Construction Specifications. The City of Stayton, its consultants, officers, employees and agents shall be named as additional insured. **Note: If the project name, permit number or additional named insured information are missing, the certificate will not be accepted.**
10. Evidence of Workman's Compensation coverage from Contractor performing the work.
11. Required performance bond.
12. Others as required by the City.

102.09.J Final plan approval by the City Engineer or Public Works for issuance of a public works permit does not in any way:

- ❖ Relieve the Developer, Design Engineer, or Contractor from the requirement for obtaining any and all reviews and permits required by agencies having jurisdiction over the work.
- ❖ Relieve the Design Engineer of responsibility for the design, or the Developer and his/her Contractor from any obligation to perform the work in strict compliance with the approved plans, specifications, and applicable permits, codes, and regulations.
- ❖ Give anyone the authorization to perform work on private property that is not owned by them. The Developer or his/her Contractor shall coordinate and receive prior approval to perform work on any private property that is not owned by them from the rightful property owner(s).

102.09.K Once the plans are approved and the public works permit issued, the Design Engineer shall be responsible for the coordination with the City, various utilities, and agencies during construction; performing or providing all surveying services necessary to stake the project; complying with the permit requirements and other agency approvals; and preparing the Record Drawings when the project is complete.

102.10 SUPPORTING INFORMATION

102.10.A The Design Engineer shall submit sufficient supporting information to justify the proposed design. Such supporting information is further summarized in each Division of these Design Standards and shall include, but not be limited to, the following:

1. Design calculations.
2. Alternate materials specifications including manufacturer's design application recommendation.
3. Storm Drainage Report for storm drains, hydrology and hydraulic calculations with basin maps.
 - ❖ For sites where infiltration will be utilized, the results of soil testing methods as specified in the Portland Stormwater Management Manual.
 - ❖ A narrative of the stormwater facility, including its intended function, and an explanation of how the outlet(s) function to meet peak discharge control and water quality treatment control requirements.
 - ❖ A downstream drainage analysis to determine the potential impacts from the project on the downstream system. Refer to Section 603.01 for more information regarding downstream analysis.



- ❖ An operation and maintenance plan shall be submitted for City review and approval for all privately financed private detention, retention, and water quality facilities. The plan shall include types and frequencies of maintenance activity required. Refer to Sections 607.05 and 608.04 for more information.
 - ❖ Refer to Division 6 of the Design Standards for additional information required.
4. Grading plan support information to include as appropriate:
- ❖ Geotechnical/Soils Engineering Report that shall include:
 - a) Data regarding the nature, distribution, strength and erodibility of existing soils;
 - b) Conclusions and recommendations for grading procedures and design criteria for corrective measures where necessary; and
 - c) Conclusions and recommendations covering adequacy of site to be developed by the proposed grading.
 - ❖ Engineering Geology Report.
 - ❖ Refer to Division 7 of the Design Standards for additional information concerning the Erosion and Sediment Control Plan.
5. For waterline systems, water model/calculations.
6. When designing sanitary sewer or stormwater facilities, a facility plan shall be submitted with the construction plans when required by the City Engineer. This plan shall be used to identify and analyze the proposed extension of facilities. The topographic plan shall show all upstream and tributary areas within at least 200-feet of the proposed development.
7. The facility plan shall include existing contours at 2-foot intervals, or as approved by the City, including location of existing structures and public and private utilities.



103 CONSTRUCTION PROCEDURES AND REQUIREMENTS FOR PRIVATELY FINANCED PUBLIC IMPROVEMENTS

103.01 CONSTRUCTION PLAN APPROVAL

103.01.A GENERAL

1. Engineered construction plans and specifications shall be reviewed and signed approved by the City Engineer, prior to construction. No construction work on privately financed public improvement projects may commence until the City issues a public works permit.
2. Privately financed public improvement projects shall obtain a public works permit within six (6) months of final plan approval by the City, unless otherwise approved in writing by the Public Works Director. If a public works permit is not obtained within this specified time period, City approval of the construction plans shall become null and void. City approval of the resubmitted construction plans may result in additional public works requirements to meet new standards or municipal code revisions, changed conditions, or new information discovered since the City's original final plan approval.

103.01.B PHASED CONSTRUCTION

1. A development that has been approved by the City to be designed and constructed in phases, the construction plans for each phase of the development shall be substantially and functionally self-contained and self-sustaining with regard to access, utilities, open spaces, and similar physical features, and shall be capable of substantial occupancy, operation, and maintenance should the subsequent phases of the development not be developed. City approval of the construction plans and the time by which construction must begin of one construction phase, shall be independent of City approval for all other construction phases of the development.

103.02 REQUIRED PUBLIC WORKS PERMITS

103.02.A Public works permits shall be issued on all public improvement projects within public rights-of-way, or easements, which will eventually be maintained and operated by the City of Stayton. Any permits required by federal, state, and local governments shall be obtained by the applicant proposing the improvements. Public improvement projects requiring permits from the City of Stayton shall include, but not necessarily be limited to, improvements or upgrades to streets, sidewalks, curbs, driveway approaches, water systems, sanitary sewer systems, and storm drainage systems. Projects that also require plan review and public works permits include all private storm drainage, sanitary sewer, and water systems that will be connected to or that will discharge into a system under the jurisdictional control of the City of Stayton.

103.02.B A public works permit for privately financed public improvement projects shall not be issued unless the subject development, and any other development of the Developer within the City of Stayton, is in substantial compliance with applicable federal, state, and local laws, rules, regulations, permits, and the approved plans relating to such developments. Developer is responsible for ensuring compliance; however, if there is a material violation of any such requirement prior to issuance of a permit, the City may elect to withhold the permit for privately financed public improvement projects until such time as the violation has been resolved to the satisfaction of the City.



103.02.C The construction, repair, or replacement of all other utilities located within a public right-of-way or public easement, including, but not exclusively, power, telephone, gas, and cable television, shall be required to submit plans for review and approval and obtain a public works permit.

103.02.D The following is a list of pertinent Permits issued by the Public Works Department:

1. Right-of-Way Permit – This permit covers the construction of utilities, streets, alleys, sidewalks, driveway approaches, curbs and gutters and other site improvement projects within the City of Stayton public rights-of-way and/or easements. All work is required to conform to the Stayton Municipal Code, Public Works Standards, applicable permits, laws, regulations, and is subject to the general terms and conditions shown on the back of the permit.
2. Site Development Permit – This permit covers the construction of privately financed public improvement projects and other development projects. All work is required to conform to the Stayton Municipal Code, Public Works Standards, applicable permits, laws, regulations, and is subject to the general terms and conditions shown on the back of the permit application. The City has provided a Site Development permit checklist as a tool to assist applicants in submitting a complete permit application.

103.03 PRIVATELY FINANCED PUBLIC IMPROVEMENT CONSTRUCTION PERIOD

103.03.A Privately financed public improvement projects shall begin construction, as deemed acceptable by the City, within six (6) months from the date a Site Development Permit has been issued. If construction does not begin within this period, the approvals of both the construction plans and the Site Development Permit will become null and void. Renewal of the approval for the construction plans and Site Development Permit may result in additional conditions to meet new standards, changed conditions, or new information discovered since the original approval.

103.03.B Privately financed public improvement projects shall be completed within two (2) years of the issuance of the public works permit unless the City extends the completion date. The City Engineer may require additional bonding and impose other conditions before granting such an extension.

103.04 APPLICABILITY OF STANDARD CONSTRUCTION SPECIFICATIONS

103.04.A The Standard Construction Specifications shall govern the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Standard Construction Specifications.

103.04.B The Standard Construction Specifications contains provisions relating to offers and contracts with the City for publicly financed public improvement projects. These provisions are not applicable to privately financed public improvement projects and are noted as such in each Section. The remaining provisions of the Standards are applicable to privately financed public improvement projects. If a Section or Subsection of the Standard Construction Specifications is not applicable in its entirety to privately financed public improvements, it is so noted in the title of the Section or Subsection. If not noted in the title as ("Not applicable to privately financed public improvements"), the Section or Subsection is applicable to privately financed public improvements except as specifically stated in the Subsection.



103.05 PRIVATELY FINANCED PUBLIC IMPROVEMENT BONDING REQUIREMENTS

103.05.A GENERAL

1. All bonds signed on behalf of the Surety shall be accompanied by a certified copy of the authority to act. Surety shall be licensed to conduct the business of surety in the State of Oregon and named in the current list of approved sureties published by the U. S. Treasury Circular 570. If the Surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in the State of Oregon, or it ceases to meet the requirements and be listed as an approved surety, Contractor shall within five (5) days thereafter, substitute another Bond and Surety, both of which shall be acceptable to City.
2. Bonding requirements for public improvement contracts with the City shall comply with the requirements of Section 104.04 of the Standard Construction Specifications.
3. Bonding requirements for privately financed public improvements shall comply with Subsection 103.05B and 103.05C below.

103.05.B PRIVATELY FINANCED PUBLIC IMPROVEMENT PERFORMANCE BOND (PERFORMANCE GUARANTEE)

1. Where public improvements are required, a performance guarantee is required to be in place, prior to issuance of a public works permit for privately financed public improvement projects. A performance guarantee is a financial commitment that warrants that certain required public improvements will be constructed in accordance with the plans and specifications approved by the City. The Developer shall provide a Performance Bond, or other form of performance guarantee acceptable to the City Manager and City Attorney, in the amount of one-hundred and twenty-five percent (125%) of the total project estimated cost of construction.
2. The cost of construction shall be determined by the tabulation of actual contractor's bids, or other method acceptable to the City Engineer. The Performance Bond shall be conditioned upon compliance with and fulfillment of all terms and provisions of the Stayton Municipal Code, the approved plans and specifications, and any agreement relating to the construction of the public improvements.
3. Double bonding will not be required on elements of the project where Marion County or ODOT requires Performance Bonding, unless otherwise determined appropriate by the City Engineer.

103.05.C PRIVATELY FINANCED PUBLIC IMPROVEMENT WARRANTY BOND (QUALITY ASSURANCE GUARANTEE)

1. A warranty bond is a financial commitment that warrants that the improvements were made according to the approved plans and specifications and that the workmanship and materials used in constructed public improvement project will satisfactorily perform for a warranty period of not less than one (1) year.
2. Record Drawings shall comply with the requirements outlined in Section 202 of the Design Standards and shall be submitted prior to issuance of the Notice of Final Completion, initiating the one (1) year warranty period.



3. After the project is deemed complete, the Developer shall provide the one (1) year warranty bond, or other form acceptable to the City Manager and City Attorney, in the amount of thirty percent (30%) of the Performance Bond. The one (1) year warranty period begins on the date of construction approval on the Notice of Final Completion. Warranty bond shall continue in force until released by written release from the City (bond may extend beyond one (1) year if Contractor corrections are outstanding).
4. If no defects are found by the end of the one (1) year warranty period, the City will make final acceptance of the work for ownership and operation and the warranty bond will be released.

103.06 PRIVATELY FINANCED PUBLIC IMPROVEMENT INSURANCE AND INDEMNIFICATION REQUIREMENTS

103.06.A The Developer shall indemnify and hold harmless the City and the City Engineer, their officers, employees, agents and consultants, from and against all claims, demands, penalties, damages, losses, expenses, including attorney's fees, and causes of action of any kind or character, including the cost of defense thereof, arising or alleged to have risen in favor of any person on account of personal injury, death, or damage to property arising out of or resulting from, or alleged to have risen out of or resulted from, in whole or in part, any act or omission of the Developer, the Developer's Design Engineer, the Developer's Contractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. See Subsection 108.11 of the Standard Construction Specifications.

103.06.B The City may require additional assurances from the Developer including, but not limited to, Certificates of Insurance from insurance companies or entities acceptable to the City and authorized to issue insurance in the State of Oregon. When required, the Certificate shall specify all of the parties who are named additional insured. At minimum, the City of Stayton and the City Engineer, their officers, employees, agents and consultants shall be named additional insured. The Developer shall be responsible for paying all deductibles, self-insured retentions and/or self-insurance included under these provisions. See Subsection 108.12 of the Standard Construction Specifications.

103.07 PRIVATELY FINANCED PUBLIC IMPROVEMENT CONTRACTOR QUALIFICATIONS

103.07.A Contractor's need not be prequalified for privately financed public improvements. However, Contractors shall be qualified and competent to perform the Work being performed and shall hold such licenses as required by State Statutes, and Federal and local Laws and Regulations for the Work being performed. If so requested by the City, Contractors shall submit written evidence such as financial data, previous experience, and such other data necessary to demonstrate Contractor's qualifications and competence to perform the Work.

103.08 PRIVATELY FINANCED PUBLIC IMPROVEMENT PRE-CONSTRUCTION CONFERENCE

103.08.A A pre-construction conference, as required in Subsection 109.02 of the Standard Construction Specifications, shall be scheduled before commencement of construction. The meeting is to include the City Engineer, the Developer's representative, Design Engineer, Contractor, Marion County and/or ODOT representative (as applicable), and all affected utility companies. The purpose of the conference is to discuss the construction schedule and times of the work which require special coordination.



103.08.B The Developer shall be responsible for notifying ODOT, Marion County, and all private utility companies of the time and location of the preconstruction conference, and requesting that a representative be present. The Developer may be required to submit proof of notification to the City prior to the pre-construction conference. Copies of notification letters sent by the Developer or Design Engineer are acceptable.

103.09 PRIVATELY FINANCED PUBLIC IMPROVEMENT CONSTRUCTION REQUIREMENTS

103.09.A GENERAL

1. During the construction period, the City will maintain three (3) sets of approved plans and specifications. The Contractor shall retain at minimum one (1) set of approved, stamped, and signed plans and specifications at the construction site at all times.

103.09.B CONSTRUCTION SURVEYING

1. EXISTING SURVEY MONUMENTS

- a. Before beginning any construction activity, the applicant's engineer/surveyor shall adequately reference all permanent survey monuments, property corners, stakes, or benchmarks on the subject site, or markers that may be subject to disturbance in the construction area or during the construction of any off-site improvements. It shall be the responsibility of the Contractor to protect survey monuments throughout the construction process. The Contractor shall not disturb permanent survey monuments without written consent from the City's authorized representative.
- b. If any survey monument is disturbed, moved, relocated, or destroyed as a result of construction activity, the Contractor shall, at Contractor's cost, retain the services of a Professional Land Surveyor registered in the State of Oregon to restore the monument to its original condition and shall file all documentation required by Oregon law. A copy of the recorded documentation shall be submitted to the City Engineer.
- c. In accordance with ORS 209.150, any person or public agency removing, disturbing or destroying any survey monument of record in the office of the County Surveyor shall cause a registered Professional Land Surveyor to file a reference with the County Surveyor and replace the monument within ninety (90) days of the removal, disturbance, or destruction. Failure to comply with this provision is subject to penalty according to ORS 209.990.

2. NEW SURVEY MONUMENTS

- a. Street centerline monumentation shall be in accordance with ORS 92.060 (2). The centerlines of all street right-of-way shall be monumented before the City shall accept a street improvement. Monuments shall be set under the direction of a registered Professional Land Surveyor. A record of survey must then be filed in compliance with ORS 209.250 and any additional requirements set forth by the City.
- b. All centerline monuments shall be placed in a monument box in accordance with the Standard Drawings. Monument boxes shall be of a type approved by the City before installation and the top of the box shall be set at design finished grade.



- c. All sanitary and storm sewers shall be placed in positions that do not interfere with centerline monumentation.
3. **PRE CONSTRUCTION SURVEY**
 - a. Pre-construction survey shall conform to the requirements of subsection 102.03 of these Design Standards.
4. **POST CONSTRUCTION SURVEY**
 - a. Post construction survey shall be performed for the development of the project Record Drawings requirements as specified in Section 109.24 of the Standard Construction Specifications and the requirements specified in Section 202 of the Design Standards.

103.09.C RAILROAD CROSSINGS

1. Crossings of railroad rights-of-way shall be done in a manner that conforms to the requirements of the railroad having jurisdiction. If any bonds or certificates of insurance protection are required, they shall be furnished by the Contractor or Developer to the railroad company concerned, with the City and City Engineer as an additionally named insured.
2. Permits or easements for such crossings shall be obtained by the Developer. All the terms of such permits or easement shall be met by the Developer and Contractor.

103.09.D STREAM CROSSINGS

1. Stream crossings shall be avoided whenever possible, whether by roads, utilities, or other development. If streams must be crossed, impacts shall be minimized by preferring bridges to culverts, and by designing bridges and culverts to pass at least the 100-year flood and meet the Oregon Department of Fish and Wildlife (ODFW) Fish Passage Criteria, or latest edition.
2. The Contractor shall comply with the regulatory requirements of the Oregon Department of State Lands, ODFW, U.S. Fish and Wildlife Department, U.S. Army Corps of Engineers, National Marine Fisheries Service, and any other state and federal agencies having jurisdiction.
3. Before any work may be performed in any stream, the method of operation and the schedule of such work shall be approved in writing by the City Engineer. The timing of in-water work shall comply with the guidelines established by the jurisdictional agency. Mechanized equipment shall enter streams only when necessary and only within the immediate work area.

103.09.E OBSERVATIONS, INSPECTIONS, AND TESTING OF CONSTRUCTION.

1. **GENERAL**
 - a. All public construction falling under the jurisdiction of the City of Stayton shall be inspected by a State of Oregon registered engineer, or a qualified individual under the supervision of a State of Oregon registered engineer. The City will not authorize work to begin on public improvements without designation of the Design Engineer's Inspector by the Owner or Developer. In addition, the Owner, Developer (if different than Owner), and the Design Engineer shall sign the City's Developer-City Agreement form before construction can begin.



- b. The Developer, directly through service contract or agreements, shall pay for required testing and all inspection costs, including costs for the City's authorized representative and City Engineer's time. The City will require inspection costs to be included in the contract surety.
- c. The Developer shall be responsible for providing the name of a compaction-testing firm that will be paid by the Developer and that will supply the City Inspector with the tests needed to certify that the soils, aggregate, and surface materials meet the minimum requirements of these Standards. The testing firm hired by the Developer shall be required to be under the direct supervision of a professional engineer registered in the State of Oregon whose area of expertise is geotechnical engineering.
- d. The Developer shall also be responsible for providing the name of a materials-testing firm that will be paid by the Developer and that will supply the City Inspector with the concrete-strength tests and other materials tests as required to certify that the materials meet the minimum requirements of these Standards. The testing firm hired by the Developer shall be required to be under the direct supervision of a professional engineer registered in the State of Oregon.
- e. An engineer whose firm, or any member of the firm, has any form of real property interest in the development for which the improvements are required cannot be designated Design Engineer's Inspector. The Design Engineer's Inspector's relationship to the project must be solely that of a professional service nature.
- f. The City will not provide full-time construction observation services for work in progress on privately financed public improvement projects. The City will, however, perform limited site observations as part of the Site Development Permit process.
- g. The Contractor shall not make connections between existing work and new work until completing necessary inspection and testing on the new work. This new work must conform in all respects to the requirements of the plans and specifications.
- h. The Design Engineer (or his/her designated Inspector) shall visit the job site and make contact with the Contractor as necessary to verify that materials and construction are meeting specifications. Amount of time spent at job site depends on the size, complexity of project, and cooperation and reliability of contractor. If the City determines the Design Engineer is not keeping adequate control of the job, or is not spending enough time at the job site, the City representative may issue a stop work order for the project until the Design Engineer's Inspector provides adequate inspection/ observation. The Design Engineer is responsible to monitor all construction and testing.

2. CITY'S CONSTRUCTION OBSERVATION OF WORK IN PROGRESS ACTIVITIES

- a. Construction observation of work in progress provided by the City Inspector will typically include the following activities:
 - ❖ Act as a liaison between the Design Engineer and/or Design Engineer's Inspector and the City;
 - ❖ Monitor both the work in progress and the required performance tests, as deemed desirable by the City Engineer;
 - ❖ Issue stop work orders upon notifying the Design Engineer's Inspector of the City's intention to do so. If the City Inspector cannot contact the Design Engineer's Inspector verbally, then the City Inspector shall send a written notification.



- ❖ Inform the City Engineer of all proposed plan changes, material changes, stop work orders, or errors or omissions in the approved plans or specifications as soon as practical. Revisions to the approved plans must be under the direction of the Design Engineer. The Design Engineer shall submit three (3) copies of the proposed revision for approval; no work affected by the revision shall be done until approved by the City Engineer.
 - ❖ Operate or coordinate operation of all valves, including fire hydrants, on existing waterlines.
- b. The City Inspector shall at all times have access to the project and will make routine observations of work in progress. Should any observation of work in progress or test results reveal that the construction of the improvements is not proceeding according to the approved plans and the specifications in this document, the City Engineer may order all work stopped, all defective work removed, or both.
- c. The Contractor shall give the City Inspector a minimum of 48 hours (two working days) advance notice before a required “milestone” test or inspection. It is the responsibility of the permit holder or Contractor to obtain inspections and approvals for all work installed.
- d. Construction observation of the work in progress for the “milestone” tests and inspections shown below is to be witnessed by the City Inspector. The Contractor and/or Design Engineer’s Inspector shall coordinate with the City Inspector as necessary during construction.
- e. The following list of minimum “milestone” tests and inspections are required.
- 1) STREETS
 - ❖ Subgrade testing or proof rolls
 - ❖ Aggregate base rock proof rolls and testing
 - ❖ Curb Inspection
 - ❖ AC pavement placement and testing
 - ❖ Sidewalk/Handicap Ramp installation
 - 2) WATER
 - ❖ All installation requiring chlorine swabbing
 - ❖ Service and/or line taps at an in service mainline
 - ❖ Filling of water system
 - ❖ Mainline or Hydrant Blowoff operations
 - ❖ Pressure and leakage tests
 - ❖ Disinfection
 - 3) SANITARY SEWERS
 - ❖ Air testing of sanitary sewer mains and laterals
 - ❖ Mandrel testing of flexible pipes
 - ❖ Hydrostatic or vacuum testing of manholes
 - ❖ Video Inspection
 - 4) STORM DRAINS
 - ❖ Air or Hydrostatic testing as required
 - ❖ Mandrel testing of flexible pipes



- f. Failure to give advance notice to the City Inspector for required inspections, receive adequate inspections, or violation of other regulations, ordinances, resolutions, rules, and City Codes as outlined in these Standards can result in one or more of the following, as determined by the City:
- ❖ Uncovering or removal of work not inspected
 - ❖ Stoppage of work until problem is resolved
 - ❖ Suspension of future inspections
 - ❖ Withholding certification of projects as complete, which is required to begin warranty period and eventual City acceptance for maintenance and operation
 - ❖ Citation for violation of the Stayton Municipal Code and its penalties and provisions

3. DESIGN ENGINEER'S INSPECTOR ACTIVITIES

- a. The following minimum activities are required of the Design Engineer or his/her designated Inspector (Design Engineer's Inspector). The Design Engineer must personally perform all activities marked below by an asterisk (*) and must supervise all individuals performing delegated activities. A recognized testing firm or another registered engineer must accomplish material testing not performed by the Design Engineer.

- 1) * Execute Developer-City Agreement form to provide engineering services including construction staking, construction inspection/observation, and Record Drawing preparation.
- 2) Maintain a project log that contains at least the following information.
 - ❖ Job number, name of Design Engineer's Inspector and designee(s);
 - ❖ Date and time of site visits, including arrival and departure times;
 - ❖ Weather conditions, including temperature;
 - ❖ A description of construction activities;
 - ❖ Statements of directions to change plans, specification, stop work, reject materials or other work quality actions;
 - ❖ Public agency contacts;
 - ❖ Perceived problems and action taken;
 - ❖ General remarks related to construction activities;
 - ❖ Final and "milestone" inspections;
 - ❖ Record all material, soil and compaction tests; and
 - ❖ Citizen contact or complaints;

NOTE: If requested by the City Engineer, all active site development projects shall be required to turn in daily inspection/observation reports to the City on a weekly basis containing information as outlined above. Upon the City's request for the daily inspection/observation reports, if the compiled reports become more than two (2) weeks in arrears, the City representative may post a stop work order on the project site.

- 3) Obtain and use a copy of City-approved construction plans and specifications;
- 4) Review and approve all installed erosion control measures prior to any site clearing or ground-disturbing activities by the Contractor.
- 5) Review and approve all pipe, aggregate, concrete, asphaltic concrete, and other materials to ensure their compliance with City standards;



- 6) * Approve all plan or specification changes in writing and obtain City approval (See City Activities above). All changes shall be with the approval of the City before the commencement of work affected by the revision;
 - 7) Monitor construction activities to ensure end products meet City specifications;
 - 8) * Perform (or have performed) material, composition and other tests required to ensure City specifications are met;
 - 9) Periodically check that curb, sanitary sewer work, storm sewer work, and pavement grades are in accordance with approved plans;
 - 10) Periodically certify to the City the amount of work completed to enable release of monies or a reduction of assurance amount;
 - 11) File a completion report that contains:
 - ❖ The original of the project completion certification;
 - ❖ A complete copy of the project log, signed by the Design Engineer and/or Design Engineer's Inspector, compiled from the contractor's, Design Engineer's Inspector, and City inspector's records;
 - ❖ A complete set of as-built/record drawing plans compiled from the contractor's, Design Engineer's Inspector, and City inspector's records;
 - ❖ A final grading as-built/record drawing certified by the Civil or Geotechnical Engineer;
 - ❖ The results of material tests, compaction tests, and soil analysis as detailed in the log.
 - 12) Call to the City's attention, by the end of that workday, all plan changes, material changes, stop work orders, or errors or omissions in the approved plans or specifications.
 - 13) Observe and record as-built/record drawing information on job site at: time of construction. The Design Engineer's Inspector should observe, approve, and document any minor deviations from plans and specifications not requiring City approval. This could include minor changing of manhole elevations, correcting unforeseen field conditions, and so forth.
 - 14) Ensure that contractor notifies police, fire, school bus, public transportation officials, and local affected residences and businesses of proposed utility outages, street closures, or traffic detouring or disruption.
 - 15) Verify that traffic control signing is in place before the start of construction, and in compliance with City-approved traffic control plan and construction sign plan.
4. **MAJOR INSPECTION CHECKLIST** – The following is the responsibility of the Design Engineer or his/her designated Inspector (Design Engineer's Inspector).
- a. **SANITARY SEWERS** -
 - ❖ Be present at initial opening of trench to verify grade and alignment and answer any questions.



- ❖ Verify grade and alignment of sewer a minimum of once for each run between manholes. If alignment and grade does not check, additional checks shall be made to ensure grade and alignment are achieved.
- ❖ Verify materials and construction meets specifications including bedding, pipe, pipe zone, tracer wire, warning tape, backfill, manholes, etc.
- ❖ Be present at air test and supply City with copy of air test results.
- ❖ Be present at compaction testing of trenches and supply City with copy of results.
- ❖ Be present at pavement patching of trenches. Verify that tack coat has been applied before paving and that all trench joints are sand-sealed following paving.
- ❖ Be present periodically when traffic is being detoured or streets are closed to monitor traffic control measures.
- ❖ Notify City when line is ready for CCTV inspection. Monitor CCTV inspections.
- ❖ Verify that manhole tops are at proper finish elevation with correct amount of grade rings.
- ❖ Be present at manhole testing. Test manhole for acceptance only after completion of surface restoration including paving and final adjustment to grade. DEQ's manhole test record form or equivalent shall be used to record the test.
- ❖ Attend final inspection of project.

b. WATER LINES -

- ❖ Be present at initial opening of trench to verify line, grade, and connection to existing water line meets specifications.
- ❖ Verify materials and construction meets specifications including bedding, pipe, pipe zone, warning tape, backfill, etc.
- ❖ Verify that a minimum of three feet (3') of cover from finish street grade is maintained. Grade stakes shall be required when water line is installed before coring of street. When water line varies from standard cover of three feet (3'), water line depths shall be recorded at grade breaks and every 100 lineal feet and referenced to final grade.
- ❖ Verify valve, fitting, and blowoff installation as per plan and location. Inspect materials before installation for compliance with plans and specifications.
- ❖ Verify joint restraint and thrust blocking as per the Standard Drawings.
- ❖ Verify service lines are proper size and material, and meter stop is at correct horizontal and vertical location.
- ❖ Verify fire hydrants meet specifications at correct horizontal and vertical location.
- ❖ Monitor water line pressure and leakage test. Notify City Inspector of time of test. Provide all test results to the City.
- ❖ Monitor water line flushing and chlorination.
 - Method of introducing chlorine to waterline must meet City and State requirements.
 - Design Engineer's Inspector to coordinate with City Inspector for water samples for bacteriological test of water purity. City Inspector will report results to Design Engineer.
 - The Design Engineer shall ensure the bacteriological tests passed and obtain approval from the City Inspector before connecting the new water system to the existing water system.
 - Discharging of the highly chlorinated water used for disinfection shall not be discharged into surface waters. The Design Engineer shall ensure Contractor disposes of flushed chlorinated water in accordance with applicable federal state and local regulations concerning said discharge.
- ❖ Be present at compaction testing of trenches and supply City with copy of results. Verify proper bedding and backfill process.



- ❖ Be present at pavement patching of trenches. Verify that tack coat has been applied prior to paving and that all trench joints are sand-sealed following paving.
- ❖ Notify Public Works ((503) 769-2919) two (2) working days before any required public water shutdown.
- ❖ Periodically be present to observe when traffic is being detoured or streets are closed to monitor traffic control measures.
- ❖ Attend final inspection of project.

c. **STORMWATER SYSTEMS -**

- ❖ Verify erosion and sediment control provisions are properly installed and maintained throughout the project.
- ❖ Be present at initial opening of trench to verify grade and alignment and answer any questions.
- ❖ Verify grade and alignment of storm drains a minimum of once for each run between manholes. Number of checks depends on quality of work being done by contractor.
- ❖ Verify materials and construction meets specifications including bedding, pipe, pipe zone, tracer wire, warning tape, backfill, manholes, etc.
- ❖ Be present at compaction testing of trenches and supply City Inspector with copy of results.
- ❖ Be present at pavement patching of trenches. Verify that tack coat has been applied before paving and that all trench joints are sand-sealed following paving.
- ❖ Periodically be present when traffic is being detoured or streets are closed to monitor traffic control measures.
- ❖ Verify that manhole tops are at proper finish elevation with correct amount of grade rings.
- ❖ Verify catch basin inlet installation per specifications at proper grade and location.
- ❖ Verify stormwater quantity and quality facilities are constructed in accordance with the plans and specifications.
- ❖ Attend final inspection of project.

d. **STREET CONSTRUCTION -**

- ❖ Monitor and document subgrade, grade elevation, and compaction testing. Observe subgrade for soft spots and unsuitable materials. Document corrective actions.
- ❖ Verify subbase rock meets specifications and grade elevation. Monitor compaction testing.
- ❖ Monitor curb alignment and elevation per survey stakes. Verify curbs meet specification requirements and that drainage blockouts, wheelchair ramps, and driveway cuts (where required) are placed correctly.
- ❖ Notify City Inspector so he/she may be present during proof rolling of subgrade, rock placement, and before paving.
- ❖ Verify installation of survey monuments at street intersections.
- ❖ Monitor asphalt placement:
 - Submit ready-to-pave notice to City for approval.
 - Apply tack coat and saw cut existing pavement.
 - Tack-coat existing curbs, manholes, and pavement before paving.
 - Test asphalt temperature against specifications.
 - Ensure depth of asphalt meets specifications.
 - Ensure class of asphalt meets specifications.
 - Ensure compaction and procedures meet specifications. Monitor compaction testing where required.



- Provide supplier's certification showing rock gradation and asphalt content of materials.
- ❖ Be present periodically when traffic is being detoured or streets are closed to monitor traffic control measures.

103.10 PRIVATELY FINANCED PUBLIC IMPROVEMENT COMPLETION REQUIREMENTS

103.10.A NOTICE OF SUBSTANTIAL COMPLETION

1. The Design Engineer shall notify the City Engineer in writing when all or a portion of the Work is considered substantially complete. Substantial completion of the Work under the Contract shall be understood to be not less than ninety-seven and one-half percent (97.5%) of the Work. If it appears to the City Engineer that the Work is not substantially complete, the City Engineer shall not authorize an inspection. The City Engineer may provide a general list of major Work components remaining before inspection will be authorized.
 - a. If it appears that the Work is substantially complete, the City Engineer shall, within fifteen (15) days after receiving notice, authorize an inspection and determine if the Work is substantially complete. If the Work is not substantially complete, the City Engineer shall notify the Design Engineer of the Work that must be performed prior to requesting another inspection.
 - b. If substantially complete, the City Engineer shall prepare a Notice of Substantial Completion. The Notice will include a general list of items (Punch List) remaining to be completed. The date of substantial completion of all the Work shall stop the accrual of liquidated damages, if applicable.
 - c. After acceptance of the Notice of Substantial Completion by both parties, the City may elect to begin using the work. If the City so elects, the City shall be responsible for operation and maintenance of the Work utilized. Design Engineer shall continue to be responsible for the Warranty requirements of Subsection 108.21, protection of the Work as required by Subsection 106.18, and all other applicable terms of the Contract.

103.10.B NOTICE OF FINAL COMPLETION

1. Notify the City Engineer in writing when Work is one hundred (100%) complete. If it appears to the City Engineer that the Work is not one hundred (100%) complete, the City Engineer will not authorize a Final Inspection. The City Engineer may provide a general list of major Work components remaining. If it appears that the Work is one hundred percent (100%) complete, the City Engineer will, within fifteen (15) days after receiving notice, authorize a Final Inspection and either accept the Work or notify the Design Engineer of Work yet to be performed.
2. If the Work is one hundred percent (100%) complete, the City Engineer will prepare a Notice of Final Completion and Provisional Acceptance of the Public Improvements as of a certain date. A Notice of Final Completion shall not be prepared until all provisions of the Permit and/or Development Agreement have been met, including but not limited to, the submission by the Design Engineer of a signed Certificate of Compliance.



103.11 PRIVATELY FINANCED PUBLIC IMPROVEMENT RECORD DRAWINGS

103.11.A For all public works improvements, the Design Engineer shall submit certified Record Drawings and electronic digital file for all approved plans at the completion of construction. Record Drawings shall comply with the Record Drawing requirements of Section 109.24 of the Standard Construction Specifications and Record Drawing plan development requirements specified in Section 202 of the Design Standards. All submittals of the Record Drawings shall be of archival quality.

103.12 PRIVATELY FINANCED PUBLIC IMPROVEMENT WARRANTY RELEASE AND FINAL ACCEPTANCE BY THE CITY

103.12.A The City will inspect the project approximately one (1) month prior to conclusion of the warranty period and notify the Developer in writing of any deficiencies which need to be corrected. The Developer shall be responsible for correcting any deficiencies prior to the warranty expiration. The City will not authorize the release of the Warranty Bond and the privately financed public improvements will not be accepted by the City for ownership and operation until all requirements have been completed to the satisfaction of the City, and all fees and charges have been paid.

103.12.B Upon successful correction any noted deficiencies and upon payment of all fees and charges to the City, the Public Works Director will authorize the release of the warranty and issue a Notice of Final Acceptance stating that the City accepts the public improvements for ownership and operation.

END OF DIVISION

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DIVISION 2

GENERAL TECHNICAL REQUIREMENTS

201 PLAN DEVELOPMENT REQUIREMENTS

201.01 GENERAL

- 201.01.A** These requirements have been established to facilitate producing engineered preliminary plans, construction plans, and record drawings that are consistent in appearance and presentation. These standards will address many of those routine questions that arise during the design and drafting stages of developments within the corporate limits of the City.
- 201.01.B** Adherence to these standards will aid the City in maintaining accurate and readily readable records. It will also aid in the efficient review and turnaround of construction plans.
- 201.01.C** These standards are to be followed by Design Engineers, Contractors, consultants, and sub-consultants who are involved in producing engineered plans for both publicly and privately financed public improvement projects. Exceptions will be made only after a request has been submitted and approved by the City Engineer. If any situation occurs that is not specifically addressed, application of good professional engineering judgment is appropriate.

201.02 CITY POLICY REGARDING ENGINEERING

- 201.02.A** It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.
- 201.02.B** Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction, and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.
- 201.02.C** City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required; the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.



201.03 REQUIRED PLAN SIZE AND SEQUENCE

201.03.A Drawing sizes shall comply with ANSI-defined standards for page width and height. Plan review drawings shall be submitted at full-size 22" x 34" (ANSI D-size sheet). Bidding and construction documents may also be printed at half-size when submitted under the same half-size requirements. Official seals and signatures on the plans shall comply with OAR 820-010-0620.

201.03.B The following plan sequence with applicable sheets for the Plan development is recommended:

- ❖ Title Sheet with Vicinity and Project Site Plan
- ❖ Legends and Abbreviations (may be included on Title Sheet)
- ❖ General Construction Notes (may be included on Title Sheet)
- ❖ Traffic Control Plan, if required
- ❖ Grading and Erosion & Sediment Control Plan (ESCP, if 1200-C or CN Permit is not needed)
- ❖ Grading and ESCP Details and Notes (ESCP, if 1200-C or CN Permit is not needed.)
- ❖ Overall Site Plan
- ❖ Composite Utility Site Plan
- ❖ Street Plan and Profile
- ❖ Storm Drain Plan and Profile
- ❖ Storm Water Facility Plan
- ❖ Water Plan and Profile
- ❖ Sanitary Sewer Plan and Profile
- ❖ Street Light Plan (may be included on composite utility plan)
- ❖ Signing and Striping Plan
- ❖ Typical Cross sections
- ❖ Typical Details
- ❖ Standard Drawings

201.04 REQUIRED PLAN INFORMATION

201.04.A TITLE SHEET

1. All projects shall include a title sheet. This requirement may be waived if the project consists of only one plan sheet. If a title sheet is not used for a single sheet project, a vicinity map must be included on the single sheet. One title sheet may be used when constructing more than one facility (sewer, storm drain, etc.); however, all requirements for the title sheet must be met. The following information shall be included on all title sheets:

- ❖ Vicinity Map to a scale of not less than 1" = 800' showing the project location.
- ❖ Project Site Map of the entire project, showing street right-of-way and/or subdivision layout to a scale of not less than 1" = 100'. A smaller scale may be used on large projects upon approval of the City Engineer. The site map shall be a composite plan showing all complete properties to be served by the improvements and properties adjacent to and within 100-feet of those served. A North arrow shall be included on the title sheet and shall be oriented to the top of the sheet.
- ❖ Design Engineer, Geotechnical Engineer, Architect, and any other design professional's name, address, and phone number.
- ❖ Owner and Developer's name, address, and phone number for privately financed public improvements.
- ❖ Index of Drawings.
- ❖ Complete legends and abbreviations (may be a separate sheet).
- ❖ Survey horizontal and vertical datum and the location of the associated control point(s).



- ❖ Permanent bench marks including their descriptions (may be on the Overall Site Plan).
- ❖ Standard construction notes and special notes relating to construction methods (may be a separate sheet(s)).
- ❖ A statement referencing the City of Stayton Standard Construction Specifications.
- ❖ Land Use File number.
- ❖ Contact phone number for all affected utility companies and pertinent City personnel.
- ❖ Utility locate information and call number.
- ❖ Tax lot numbers or lot and block designations.

201.04.B PLAN AND PROFILE SHEETS

1. PLAN SHEETS

a. Plan sheets shall be laid out and organized in a fashion that facilitates easy plan reading and interpretation. Other than for the composite utility plan, all proposed utility improvements shall be laid out on individual plan sheets. For example, street, sewer, water, and storm drain plans shall each be on their own designated plan sheet. Do not combine utilities and street plans on the same plan sheet unless otherwise directed by the City Engineer. Where approved, storm drain improvements associated directly with street improvements can be combined on the street plan sheets.

b. Plan sheets shall show all existing improvements within the boundary of the project and within 300-feet of the terminus of the proposed improvements. Items that should be included are:

1) Natural Features – Identify all relevant features, including ditches, swales, channels, streams, trees, etc. All trees with 6-inch and larger diameters shall be shown on the plans. The plan shall identify the location, caliper, and species of the tree and shall indicate if the tree is proposed to remain or to be removed. Existing and proposed topography contours shall cover the entire site and, whenever practicable, a minimum of 50-feet beyond the site boundary. Existing topography should be screened.

a) Topography contour intervals shall be shown at the following maximum intervals. Alternative intervals may be used with prior approval of the City Engineer.

- ❖ 1-foot, for slopes less than 10%.
- ❖ 2-foot, for slopes between 10% and 40%.
- ❖ 5-foot, for slopes greater than 40%.

b) At the Design Engineer’s discretion, contours may be partially removed or clipped out as necessary to keep the drawing clear and uncluttered.

c) Recommended indexing of contours shall be as follows:

Contour Interval	Indexed Interval
1'	5'
2'	10'
5'	25'
10'	50'



- d) Contour cross sections are generally to be created with the same vertical and horizontal scale factors. Grid spacing is to be developed such that grid lines appear every 0.25-inch in the horizontal direction with labels every 0.5-inch. Vertical grid spacing may be as often as necessary to convey the needed information.
- 2) Transportation Improvements – Show all existing edge of pavement/curbs, bridges, alleys, driveways, and sidewalks that are adjacent to or abutting the project. Include the location of curb cuts and wheel chair ramps. Show all lights, signs, signals, signal loops, boxes, etc. Show all railroad lines and crossings. Show existing slopes and grades of improvements.
- 3) Public Utilities – Show all water, sewer, and storm drain lines, including service laterals. Identify manholes, drainage inlets and outlets, valve and meter locations, hydrant locations, and all other appurtenances. Indicate elevations of each feature at match points with the appropriate slope, grade, or direction of flow indicated. Abandoned utilities shall also be shown where known.
- 4) Franchise Utilities – Show franchise utilities, including underground and overhead lines, vaults, poles, and all appurtenances, located within or adjacent to the project, or that would be affected by the project.
- 5) Private Improvements – Show all property and right-of-way lines, easements, and found survey monuments. Show all relevant existing improvements within or adjacent to the project, such as railroads, private streets and walks, landscaping, fences, walls, trees, buildings or structures, wells, private utility lines and appurtenances, and any other existing feature that would impact or be impacted by the project.
- 6) Hydrology – Location of water courses, streams, ditches, and swales.

NOTE: The Design Engineer shall perform field investigations to determine the most accurate depiction of existing utilities. This shall be done to assure the project can be built as designed and to prevent potential conflicts that will significantly alter the construction of the improvements from the approved plans. City as-built drawings are only to be used as aids to the Design Engineer when field verifying the existing facilities.

2. PROFILES

- a. Profiles for the improvements shall be to the same horizontal scale on the same sheet and drawn immediately below the corresponding plan view, and shall be required in the following instances:
 - 1) All street, water, sewer, and storm drain improvements. Profiles shall show all utility, railroad, and culvert crossings, ditch or stream crossings (with elevations of the ditch or stream bed), the 100-year flood elevation profile and casing details.

201.04.C EROSION AND SEDIMENT CONTROL PLANS

1. Erosion and sediment control measures are required by the City for all developments, regardless of project size, and shall be shown in the submitted plan review sets. Construction projects which disturb one or more acres of land through clearing, grading, excavating, or stockpiling of fill material, or less than one acre that is part of a larger common plan of



development or sale that ultimately disturbs one acre or more is required to obtain a DEQ NPDES 1200-C or CN permit. A DEQ approved 1200-C or CN permit will be required to be submitted to the City prior to final plan approval.

2. Construction projects anticipating construction activity between October 1st and May 31st (Wet Weather Construction Season) will be required to submit a plan addressing "wet weather" measures as outlined in the ODOT Erosion Control Manual. Construction activity is assumed as "active" until permanent vegetation and/or erosion protection is established.
3. The plan shall include existing contours, location of erosion control facilities (e.g., silt fence, straw mulch, sediment ponds, etc.); inlet and outlet structures (e.g., catch basins, culverts, creeks, etc.); and existing public and private utilities.
4. See City of Stayton Design Standards Division 7 for erosion and sediment control plan requirements.

201.04.D ADDITIONAL PLAN REQUIREMENTS

In addition to the standard information that must be provided on all plans, there are some specific information and guidelines required on plans for each type of improvement.

1. STREET IMPROVEMENTS

- ❖ Standard cross section with structural sections for each street. Cross sections shall extend a minimum of 2-feet beyond the existing or proposed right-of-way. In steeper areas, cross sections shall be shown to catch points. Cross sections shall be developed for all areas where improvement dimensions are different and for all locations where the adjacent property's topography changes.
- ❖ Dimensions shall be shown on each plan sheet indicating right-of-way width, street width, distance from centerline to face of curb, width of the landscape strip, and sidewalk width.
- ❖ Show the construction centerline for each street, with stationing labeled at 50-foot intervals, beginning and ending points, centerline intersections, and changes in horizontal alignment. The horizontal alignment of new and existing streets shall be shown 300-feet beyond the proposed termination point of the improvements, unless otherwise approved by the City Engineer. Stationing shall be established so that stationing is a positive number with station numbers ascending west to east and south to north (no negative stationing).
- ❖ For each horizontal curve, show stationing labels for Point of Curvature (PC), Point of Reverse Curvature (PRC), and Point of Tangency (PT). In a table on the plan sheet, show the centerline curve data including the tangent length, curve length, long chord distance, delta angle, and centerline radius distance.
- ❖ Show face of curb alignment throughout the project, labeling alignment changes with street stationing. The beginning or end of curb returns at intersections shall be labeled with the appropriate street station, with curb return data listed in a table on the plan sheet. The table shall show the total length of the return, delta angle, curb radius distance, and elevations of the beginning, 1/4-delta, 1/2-delta, 3/4-delta, and end of the return.
- ❖ The profile information for each street design shall be to the same horizontal scale, on the same plan sheet, and drawn immediately below the corresponding plan view. The profile grid shall clearly show elevations along the left and right sides of the grid and label stations every 50-feet along either the top or bottom of the grid.



- ❖ Show the existing ground and finish grade profiles at the top face of curb (or at edge of pavement if curb is not being constructed), road centerline, and right of way line (light lined). The proposed future vertical alignment of dead-end streets shall be shown 300-feet beyond the proposed termination point, and the vertical alignment of existing side streets shall be shown at least 40-feet beyond the curb return. This is to ensure that the street grade is set low enough to enable the adjacent properties to drain to the street. On each plan sheet, the street and curb grades shall be labeled on the profile for each tangent section near grade breaks or vertical transitions.
- ❖ For each vertical curve, label the station and elevation for the Vertical Point of Curvature and Vertical Point of Tangency on the profile. At a convenient location on the profile, list the station and elevation for the Vertical Point of Intersection, Turning Point, and length of the vertical curve.

2. WATER SYSTEM IMPROVEMENTS

- ❖ Detailed Plans shall be included for all water system appurtenances and connections to existing water lines. Type and connection configuration of all proposed fittings, valves, and appurtenances. All connection and detail information shall be shown on the plan view and not the profile view.
- ❖ Type of material and class of pipe between fittings.
- ❖ Type and location of internal restraint where required. Pipe with internal restraint shall be shown as a heavier/different line type than pipe without internal restraint.
- ❖ Backfill material of the trench.
- ❖ All water system components not specifically covered by the Standard Drawings shall be identified on the construction plans. Components shall be identified as to type and connection configuration, i.e. flange, mechanical joint, etc.

3. SANITARY SEWER IMPROVEMENTS

- ❖ Type of material and class of pipe between manholes.
- ❖ Backfill material and surfacing of the trench.
- ❖ Invert elevations, direction, and diameter of all pipes at manholes.
- ❖ Rim elevations of all manholes (and ground elevation if different than rim elevation).
- ❖ Pipe lengths and slopes.
- ❖ Service lateral information (lot number, i.e. and station at the mainline, ie/depth at end of lateral, lateral pipe size, material, slope, and length) shall be listed in a table on the plan sheet for all Subdivisions and Partitions.
- ❖ Lateral connection locations are to be shown on the profile.
- ❖ All sewer system components not specifically covered by the Standard Drawings shall be identified on the construction plans.

4. STORM DRAIN IMPROVEMENTS

- ❖ All areas improved or unimproved lying upstream and draining to or through the proposed development.
- ❖ Show contours at a minimum of 1 foot contour intervals, or as approved by the City Engineer with the location of existing buildings, structures, and public and private utilities on the property. Slopes over 10% may use 2-foot intervals; extend contours a minimum of 100-feet beyond property.
- ❖ Locations of all subsurface water outlets (e.g., springs).
- ❖ Location of any existing building, structure, or parking lot on adjacent property that is within 30-feet of a proposed public drainage facility.



- ❖ Arrows indicating drainage direction in all public and private property and for all hydraulic conveyance systems. Identify the route used in determining the post-developed time of concentration.
- ❖ Type of material and class of pipe between manholes and inlets.
- ❖ Backfill material and surfacing of the trench.
- ❖ Invert elevations, direction, and diameter of all pipes at manholes.
- ❖ Rim elevations of all manholes (and ground elevation if different than rim elevation).
- ❖ Pipe lengths and slopes.
- ❖ Inlet and outlet details, including grate details.
- ❖ Each storm facility's information (area, depth, and volume) shall be listed in a table on the plan sheet for all Subdivisions and Partitions unless otherwise approved.
- ❖ Service lateral information (lot number, i.e. and station at the mainline, ie/depth at end of lateral, lateral pipe size, material, slope, and length) shall be listed in a table on the plan sheet for all Subdivisions and Partitions.
- ❖ All storm drain system components not specifically covered by the Standard Drawings shall be identified on the construction plans.

5. EROSION CONTROL/GRADING PLANS

- ❖ Proposed full erosion control plan including, sediment fences, interceptor ditches (channels), velocity check dams, matting, areas of proposed reseeding, and any other proposed erosion control measures and details. All erosion control plans shall comply with the City of Stayton Design Standards Division 7 for projects smaller than one acre and DEQ 1200-C or CN permit requirements for projects larger than one acre.
- ❖ Location of all existing drainage facilities and water courses, including wetlands and floodplain areas.
- ❖ Location of proposed drainage facilities that transport surface water across or from the site; including, artificial channels, under drain pipes, and culverts.
- ❖ Boundaries of all areas that will be paved or otherwise altered, in a manner that will increase surface water runoff and boundaries of all areas to remain in an existing or natural condition.
- ❖ Open channel invert and top of bank slopes. High and mean water surface elevations shall also be shown on the plans where appropriate. Cross sections shall be shown for each section of open channel. The cross sections shall have invert, top of bank, high, and mean water surface elevations labeled on them.
- ❖ Identify cut/fill areas (hatching, shading, or labels); structural fill placement areas (hatching, shading, or labels); erosion prevention and sedimentation control methods; reseeding areas (hatching, shading, or labels).
- ❖ Final plans shall have a cut/fill table identifying quantities of materials to be imported or exported to or from the site.
- ❖ Show contours at a minimum of 1-foot contour intervals, or as approved by the City Engineer with the location of existing buildings, structures, and public and private utilities on the property. Slopes over 10% may use 2-foot intervals and slopes over 40% may use 5-foot intervals; extend contours a minimum of 100-feet beyond property.
- ❖ Identify the direction of flow for all ditches and creeks and water surface elevations.
- ❖ Identify drainage direction and drainage basin boundaries.
- ❖ Provide cross sections or profile plans to show existing and final grading.



201.05 PARTIAL PLANS, SECTIONS, AND DETAILS

201.05.A PARTIAL PLANS

1. Plans that do not show entire structure, facility, areas, or similar features, shall be titled "Partial Plan." Do not abbreviate "Partial."
2. Plans shown within a structure shall have the elevation as part of the title. Such a title would read: "PLAN AT ELEVATION 94.00." The elevation indicated shall be the high-point elevations of the bottom slab.

201.05.B SECTIONS

1. Sections shall be called out alphabetically within a series of drawings, with the section letter used only for one section in that series. When the sections are so numerous that the alphabet is used up, start with AA, AB, AC, etc. The letters I, O, or Q should not be used.
2. Section cuts and the views they indicate may be shown either on the same drawing or on a different drawing. If a drawing shows only sections, details, and so on, sections take precedence, and are shown in sequential order from the drawings top left corner.
3. Show a section cut on the drawing with a cutting-plane line terminating at both ends. Where space is limited, use an arrowhead on one end. In the balloon's top half, enter the sequential cutting plane letter for that drawing; in the bottom half, the sheet number where the section drawing appears.

201.05.C DETAILS

1. Details shall be called out numerically within a series of drawings, with the detail number used only for one detail in that series. Call out a detail with a sequential number, slash, and drawing reference. Drawing number(s) use the same format as for section balloons, but use sequential number in the top half. As with sections, details may be shown on the same drawing or different drawings depending on their size.

201.06 TITLE BLOCKS

201.06.A Standard title blocks shall be used unless otherwise specified. The preferred location for the title block is vertically on the right-hand side of the drawing.

201.06.B Upon creation or revision of a drawing, the information/attributes inserted into the title block of the drawing shall be revised. All information relevant to finding the file, plotting the file, and dating the plot shall be listed in the appropriate portion of the title block.

201.06.C Regardless of the title block location and or size, the title block shall contain the following at a minimum:

- ❖ Date, time, and file name.
- ❖ Sheet title.
- ❖ Owner and Project name.
- ❖ Design Engineer's contact information – name, address, telephone numbers, e-mail address, logo, etc.
- ❖ Design Engineer's stamp and signature.



- ❖ Review stamp (if applicable) - When plans are submitted to the City for review and comment, the plans shall be clearly marked "**PRELIMINARY** or **NOT FOR CONSTRUCTION**" over the engineering stamp and signature.
- ❖ Date of last edit of drawing.
- ❖ Revision block including area for revision number, description, date, and name.

201.07 PLAN SCALES

- 201.07.A** All construction plans are to have the scale clearly indicated. When the drawing contains only one (1) view, detail, or section, the scale is to be noted prominently on the drawing. When the drawing contains multiple views, and/or details, and/or sections, the scale is to be noted as part of each individual component's title. When all views and/or details and/or sections on a single drawing are the same scale, the scale should be noted in the appropriate space on the drawing.
- 201.07.B** The preferred scale for plan and profile drawings shall be 1" = 20'. However, scale must be selected with the following requirements in mind:
1. Maintain clarity when notes and dimensions are added to the drawings.
 2. Maintain legibility when drawings are reduced to half size.
 3. The use of distorted scales (different horizontal and vertical scales) is acceptable for profile drawings. For example, for plan and profile views, the vertical and horizontal scales should have a 1:10 ratio where possible. That is, if the vertical scale is 1-inch = 2-feet, then the horizontal scale should be 1-inch = 20-feet.
- 201.07.C** A graphic scale is required on all drawings, maps and graphics. The graphic scale shall be 2-inches long on ANSI D-sized sheets and 1-inch long on ANSI B-sized sheets. It shall have a minimum of three (3) labels, with the leftmost label being zero (0) and the middle and rightmost labels displaying the appropriate distances respectively.

201.08 ORIENTATION

- 201.08.A** General plans such as maps and site plans must always include a north arrow. If possible the north arrow should point to the top on all drawings. However, the north arrow should be oriented to allow project stationing to increase from left to right and from bottom to top of page. However, North should not be oriented to the bottom of the page.
- 201.08.B** North arrow locations on construction plans are preferred in the upper right or left corner. Exceptions may be made, but consistency should be maintained throughout the drawing set.
- 201.08.C** For ANSI B-size, the size of the North arrow should be 1.0-inch from top to bottom. For D-size drawings, the size of the North arrow should be 2-inches from top to bottom.

201.09 TEXT

- 201.09.A** All text shall be legible on full- and half-sized plans.
- 201.09.B** Uppercase lettering shall be used for all text.
- 201.09.C** Whenever text and linework conflict, the text should be relocated if possible. If this is not possible, the linework can be broken at the drafter's discretion.



201.09.D For mapping projects, the drafting standards shall be applied wherever possible unless specific presentation needs require the use of special fonts. The use of special fonts should be minimized and font sizes, placement, and location should be consistent throughout the project. Arial font is recommended.

201.10 DIMENSIONS

201.10.A Dimensions less than 12-inches shall be shown as inches with an inch label (i.e., 11"). Dimensions 12-inches and larger shall be shown in feet and tenths of feet. Decimal fractions shall be rounded off to the nearest hundredth. Horizontal dimensions shall be shown on plan views only unless used on other views when needed for clarity. Vertical dimensions shall be shown on sections, elevations, and details only unless used on other views when needed for clarity. Dimensional repetition shall be avoided.

201.10.B Dimensions referring to structure size, wall thickness, wall penetrations, and the like shall be shown on structural drawings only, unless required on other drawings for clarity. Dimensions locating equipment, clearance between equipment or between piping shall be shown on mechanical drawings only.

201.10.C Dimensions shall be set as follows:

- ❖ All dimensions and leader lines shall use arrows 0.125-inch long.
- ❖ All text shall be centered above the dimension.
- ❖ All dimensions shall force interior lines.
- ❖ Text shall be parallel with the dimension line.

201.11 LEADER LINES

201.11.A Avoid leader lines that are the following:

- ❖ Horizontal or vertical.
- ❖ At the same angle as cross-hatching.
- ❖ At very small angles to the terminating surface.
- ❖ Parallel to extension or dimension lines.
- ❖ Curved.
- ❖ Crossed.
- ❖ Too long.

201.11.B Crossing dimensions and leaders are generally to be avoided. When necessary, the leader lines are to be broken so that the lines will not physically cross on the paper.

201.12 USE OF ABBREVIATIONS

201.12.A Abbreviations shall be used only when enough room is not available to spell out the word. Any abbreviations used on the drawing shall be defined on the cover sheet of the plans. If there is any question as to the meaning of an abbreviation, spell out the entire word.

201.12.B Standard abbreviations to be used for different pipe types are as follows:

- ❖ ABS – Acrylonitrile Butadiene Styrene
- ❖ ACP – Asbestos Cement Pipe
- ❖ CIP – Cast Iron Pipe
- ❖ CLDI – Cement Lined Ductile Iron
- ❖ CMP – Corrugated Metal



- ❖ CONC – Concrete
- ❖ DI – Ductile Iron
- ❖ GALV – Galvanized
- ❖ HDPE – High Density Polyethylene
- ❖ NCP – Non-Reinforced Concrete
- ❖ ODDW – Steel, Outside Diameter, Dipped and Wrapped
- ❖ PVC – Polyvinyl Chloride
- ❖ RCP – Reinforced Concrete Pipe
- ❖ STL – Steel
- ❖ VCP – Vitrified Clay Pipe



202 RECORD DRAWING DEVELOPMENT REQUIREMENTS

202.01 GENERAL

- 202.01.A** All Record Drawing construction plans shall be submitted as specified in Subsection 109.24 of the Standard Construction Specifications and 103.09.B of the Design Standards.
- 202.01.B** For all public improvements the Design Engineer shall submit preliminary Record Drawing construction plans and a copy of the Preliminary Punch List Item checklist to the City Engineer for review and use during the Substantial Completion Inspection walkthrough.
- 202.01.C** For all public works improvements, the Design Engineer shall submit certified final approved Record Drawings for all plans that were approved for construction. For privately financed public improvements, submission of Record Drawings is required prior to notice of final completion and provisional acceptance.
- 202.01.D** A final grading as-built/record drawing certified by the Civil or Geotechnical Engineer as applicable.
- 202.01.E** All final Record Drawings shall be submitted to scale on full-size 22" x 34" high quality bond paper or 4-mil Mylar, unless approved otherwise. Drawings shall be drawn such that reduction of plans from full-size to half-size (11" x 17") can be done and maintain a true scale on the half-sized plans.
- 202.01.F** All final Record Drawings shall be submitted to the City with the reproducible Record Drawings, a digital file containing electronic PDFs and cad files (AutoCAD, Civil 3D or other as approved) of all public improvements constructed during and in conjunction with the project. Use only standard AutoCAD compatible line types, fonts, and shapes. If the City encounters significant problems during reproduction, the drawing shall not be accepted.
- 202.01.G** If cross-references are used with a drawing, bind all cross-references before submission. The City will not accept drawings without proper cross-references. Purge all invisible drawing objects before submission.
- 202.01.H** Media files submitted on the digital file shall be clearly labeled with City project number, project name, file name and extension(s), AutoCAD version, and date.
- 202.01.I** Submit information required to reproduce a hard copy from the electronic file. The electronic copy and the hard copy shall be identical with the exception of the original signature on the Design Engineer's stamp.
- 202.01.J** Record Drawings shall accurately represent as-built construction and shall be graphically and mathematically correct, i.e., drawing shall represent changes in dimensioning during construction. Record Drawings shall be drafted in the same manner as the original plans with clear indication of all modifications (strike out old with new added beside). Actual location and depth from finish grade of any other utilities encountered during construction shall be shown and noted on both plan and profile of the Record Drawings.
- 202.01.K** Record Drawings shall include all private and public easement information.
- 202.01.L** The words "Record Drawing" or "As-built Drawing" shall appear as the last entry in the revision block along with the month, day, and year the Record Drawing was prepared.



202.01.M When applicable, drawing content shall include information needed to update City inventories and databases information.

202.02 REQUIRED RECORD DRAWING INFORMATION

202.02.A STREETS

1. The following minimum information shall be noted on street Record Drawings:
 - ❖ Change in horizontal alignment, curve data, and stationing of primary control points (e.g., PC, PI, PT, PRC).
 - ❖ Vertical curve or grade changes; change in location of low point in sag vertical curve.
 - ❖ Change to approved thickness for street structural section components. Show station limits where changes in structural section have occurred.
 - ❖ Change to driveway locations or widths.
 - ❖ Other change altering the approved plans.

202.02.B WATER

1. The following minimum information shall be noted on water Record Drawings:
 - ❖ Station and/or property line/corner to valves (not at standard location), all fittings, blow-offs, and dead-ended lines.
 - ❖ All changes from standard 36-inch depth cover; limits shall be shown on plan with annotated reason for change; actual pipe elevation (top of pipe) will be taken at every fitting that is not at standard cover.
 - ❖ Show alignment changes, grade changes, and changes in construction materials; if changed alignment results in station changes, a station equation shall be shown as appropriate at a fitting.
 - ❖ Provide manufacturer of all valves; identify types of fittings (e.g., MJ x MJ, FLG x MJ, etc.); provide information in the form of an inventory list on construction drawings.
 - ❖ Other change altering the approved plans.
 - ❖ Actual location and depth, from finish grade of street, of any other utilities encountered during construction.

202.02.C SANITARY SEWERS

1. The following minimum information shall be noted on sanitary sewer Record Drawings:
 - ❖ Update the Sewer Lateral Table required in 201.04.D.4.
 - ❖ Station of wye or tee into main line; tie end of service lateral to nearest property corner at right-of-way line and distance back from the face of curb.
 - ❖ Depth at the end of service lateral measured from existing ground to invert of pipe; invert elevations shall be noted.
 - ❖ Length of service lateral measured from centerline of sewer main to end of pipe.
 - ❖ Show alignment changes, grade changes, and changes in construction materials; if changed alignment results in station changes, a station equation shall be shown as appropriate at a manhole.
 - ❖ Depth at the manholes measured from existing ground to invert of pipe; invert elevations shall be noted.
 - ❖ Type of pipe, backfill material, and location.
 - ❖ Other change altering the approved plans.



202.02.D STORM DRAINS AND STORM WATER FACILITIES

1. The following minimum information shall be noted on storm drain and storm water facility Record Drawings:
 - ❖ As-built survey to verify elevation and storage volumes for stormwater detention/retention facilities and Water Quality basins.
 - ❖ Station of connection into main line; tie end of branch line to nearest property corner at right-of-way line and distance back from the face of curb.
 - ❖ Show alignment changes, grade changes, and changes in construction materials; if changed alignment results in station changes, a station equation shall be shown as appropriate at a manhole.
 - ❖ Type of pipe, backfill material, and location.
 - ❖ Other change altering the approved plans.

END OF DIVISION

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DIVISION 3

STREETS AND ALLEYS

301 GENERAL

301.01 AUTHORITY AND PURPOSE

- 301.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City. Most of the elements contained in these Design Standards are public works oriented and it is intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements.
- 301.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects that ultimately will be owned, operated, or maintained by the City shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 301.01.C** The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of public improvements shall be implemented. All public system improvements and public works facilities shall be designed and constructed in accordance with applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals, and in accordance with applicable federal, state, and local statutes and rules. Approval of public improvements must be made by the City Engineer or the Public Works Director before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- 301.01.D** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every public improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 301.01.E** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.
- 301.01.F** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such variance will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.



- 301.01.G** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. Request must show that the variance meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All requests will be in writing and be accompanied by engineered drawings and final design calculations.
- 301.01.H** All franchise utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City Standards.
- 301.01.I** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.
- 301.01.J** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 301.01.K** On completion of projects to become public works, the Design Engineer shall submit one complete set of reproducible "Record Drawings" (As-Builts), a compact disc (CD) containing electronic PDFs and cad files (AutoCAD/Civil 3D or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification.
- 301.01.L** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 301.01.M** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.
- 301.01.N** The objective of these Design Standards is to develop a street system that will:
- ❖ Be consistent with the Stayton Municipal Code (SMC), Standard Construction Specifications, and applicable state and federal regulations and requirements.
 - ❖ Be of adequate design to safely manage the volumes of vehicles anticipated using the improvements.
 - ❖ Provide points of connection for streets by adjacent future development.
 - ❖ Prevent the capacity of transportation facilities from being exceeded.
 - ❖ Provide transportation improvements that meet the long-term needs for quality streets.
 - ❖ Maintain or improve overall transportation quality.
 - ❖ Be designed in a manner to allow economical future maintenance.
 - ❖ Be designed using materials to insure a minimum practical design life of twenty (20) years.

301.02 APPLICABILITY

- 301.02.A** These Design Standards will govern the design for the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Design Standards.



301.02.B Street improvements shall be provided for all property improvements within the City of Stayton per these Design Standards for the following types of development:

- ❖ Partitions and Subdivisions.
- ❖ Construction or reconstruction of public and private roadways and temporary detours.

301.03 REFERENCES

301.03.A These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Subsection 101.03 and others specifically listed below. Projects are expected to be consistent with the following:

1. Applicable design criteria and concepts consistent with the most recent Transportation System Plan adopted by the City of Stayton unless more restrictive criteria are identified herein. Where additional detailed information and background is required for a particular project, the Transportation System Plan shall be referred and adhered to, as applicable. Any deviations from the Transportation System Plan shall be flagged and presented to the City Engineer for consideration.
2. Applicable design guidelines published by the American Society of Civil Engineers.
3. Applicable design guidelines published by the Federal Highway Administration.
4. Applicable design guidelines published by the Oregon Department of Transportation.

301.04 SPECIAL DESIGN APPLICATIONS

301.04.A Special design applications not covered in these Design Standards require review and approval by the City. Submittal of full design calculations, supplemental drawings, and information will be required prior to any approval.

301.04.B Such design applications requiring special review and approval include, but are not limited to, the following:

- ❖ Bridges
- ❖ Roundabouts/Traffic Calming
- ❖ Traffic Signals
- ❖ Electrical/Control/Telemetry Devices

301.05 STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS

301.05.A Except as otherwise provided by these Design Standards, all construction design detail, workmanship, and materials shall be in accordance with the current edition of the City of Stayton Public Works Standard Construction Specifications and Standard Drawings.

301.06 CITY POLICY REGARDING ENGINEERING

301.06.A It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.



301.06.B Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction, and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.

301.06.C City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required; the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.

301.07 CONVENTIONS USED THROUGHOUT THE DESIGN STANDARDS

301.07.A See Subsection 101.07 for conventions used throughout these Design Standards.

301.08 ORGANIZATION AND CLASSIFICATION OF DIVISIONS

301.08.A See Subsection 101.08 for the organization and classification of divisions throughout these Design Standards.

301.09 CLARIFICATIONS, MODIFICATIONS, AND REVISIONS TO DESIGN STANDARDS

301.09.A These Design Standards will be periodically updated due to changes in policy or procedures, new technology, and methods of design and construction. Periodic revisions to these Design Standards will be necessary to maintain consistency in that regard. The date appearing on the title page is the date of the latest revision for each Division. Parenthetical notations at the bottom of each page indicate the most recent change. It will be the user's responsibility to obtain and maintain his/her copy of these Design Standards with the latest changes.

301.09.B See Subsection 101.09 for general policies and procedures regarding clarifications, modifications, and revisions to the Design Standards.

301.10 DEFINITIONS AND TERMS

301.10.A See Subsection 101.10 for standard definitions and terms used throughout these Design Standards.



302 GENERAL DESIGN REQUIREMENTS

302.01 PERFORMANCE STANDARDS

- 302.01.A** Street designs shall provide for the safe and efficient travel of motorist, bicyclists, and pedestrians. Streets shall be designed to carry the recommended traffic volumes identified for each street classification. Street classifications are set forth in the Transportation System Plan (TSP) and the Stayton Municipal Code (SMC). For general guidance, a table titled Geometric Design Requirements by Street Functional Classification is shown at the end of this Division.
- 302.01.B** Designs shall conform to the Transportation System Plan, Fire District requirements, Standard Construction Specifications, Stayton Municipal Code, and all other applicable laws and regulations. Streets shall be designed to meet or exceed minimum guidelines set forth in the "AASHTO Policy on Geometric Design of Highways and Streets" (latest edition). Traffic Control Devices shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways," Federal Highway Administration with Oregon Supplements, and Oregon Department of Transportation (latest edition).
- 302.01.C** Vertical and horizontal curves shall meet the guidelines of the AASHTO policy and the design speed for each street classification. Where practical, the Design Engineer shall provide the decision sight distance for the design speed based on the methodology in AASHTO, or the stopping sight distance based on the 85 percent speed as set forth in the AASHTO policy, whichever is greater. Only with the approval of the City Engineer will a lesser sight distance be permitted.
- 302.01.D** It shall be the responsibility of the Developer to preserve and protect the current pavement condition index rating and the structural integrity of the existing streets and roadways from construction traffic to the satisfaction of the Public Works Director throughout all phases of development. Failure to preserve and protect the roadways may result in the Developer being responsible for replacing and reconstructing the damaged roadways at the Developer's expense.

302.02 TRANSPORTATION IMPACT ANALYSIS

- 302.02.A** A transportation impact analysis (TIA) report, as determined by the type of development and its potential impact to existing street systems, shall comply with the requirements set forth in Stayton Municipal Code (SMC) 17.26 and as determined by the City Engineer and City Traffic Engineer. The report shall be prepared by a traffic engineer licensed in the State of Oregon. The TIA provides the City with an objective assessment of the anticipated modal transportation impacts associated with a specific land use action. The TIA answers important transportation-related questions for the City that are specific to the project such as:
1. Can the existing transportation system accommodate the proposed development from a capacity and safety standpoint?
 2. What transportation system improvements are necessary to accommodate the proposed development?
 3. How will access to the proposed development affect the traffic operations on the existing transportation system?
 4. What transportation impacts will the proposed development have on the adjacent land uses, including commercial, institutional, and residential uses?
 5. Will the proposed development meet current standards for roadway design?



- 302.02.B** Cooperation between City staff, the applicant, and the applicant's traffic engineer is encouraged to provide an efficient and effective process.
- 302.02.C** The City Engineer may require additional study components in a TIA beyond what is outlined in SMC 17.26.
- 302.02.D** When a Transportation Assessment Letter (TAL) is Required. If a TIA is not required, the Developer's traffic engineer shall submit a transportation assessment letter to the City indicating the proposed land use action is exempt. This letter shall outline the trip-generating characteristics of the proposed land use and verify that the site-access driveways or roadways meet City of Stayton sight-distance requirements and roadway design standards.
- 302.02.E** The City of Stayton assumes no liability for any costs or time delays (either direct or consequential) associated with the preparation and review of a TIA or TAL.

302.03 STREET IMPROVEMENT PLANS

- 302.03.A** Complete plans and specifications for proposed street improvement projects, including any necessary public dedications and easements, shall be submitted to the City Engineer for review. Such plans and specifications must receive City Engineer approval prior to construction permit issuance and prior to beginning of construction. Engineering documents shall be prepared by a Professional Engineer registered and licensed in the State of Oregon.
- 302.03.B** Engineering design plans drawn to scale, showing the existing and proposed streets, shall be submitted in accordance with Division 2 of these Design Standards.

302.04 STREET JURISDICTIONAL OVERSIGHT

- 302.04.A** Street rights-of-way within the City of Stayton are a combination of State (ODOT), County (Marion), Local (City), and privately owned. For general guidance, a map titled Street Jurisdictional Oversight Map is attached at the end of this Division to assist Developers and Design Engineers during the planning level and preliminary stages of a particular development.

302.05 STREET FUNCTIONAL CLASSIFICATION, RIGHT-OF-WAY AND PAVEMENT WIDTHS

- 302.05.A** Streets and alleys within the City shall be as classified in the Transportation System Plan including any amendments. For general guidance, a map titled Street Functional Classification Map is shown at the end of this Division. Right-of-way and pavement widths for each classification shall comply with the Geometric Design Requirements by Street Functional Classification table also shown at the end of this Division. The classification for any street and alley not listed will be that determined by the City Engineer.
- 302.05.B** For streets designated as a Neighborhood Collector and lower classification, the Design Engineer may consider design modifications to conserve major trees, as applicable, in the public right-of-way. Modifications will require approval of the City Engineer. Pavement width on a Neighborhood Collector street may be reduced to no less than 34-feet, consisting of two (2) 10-foot travel lanes and two (2) 7-foot on-street parking lanes, as approved by the City Engineer.
- 302.05.C** Right-of-way dedication at intersections shall be sufficient to at minimum provide 1-foot clearance behind sidewalks and handicap ramps.



302.06 STREET NAMES AND TRAFFIC CONTROL SIGNAGE

- 302.06.A** Street names for new development must be approved by the City after consultation with emergency services, prior to recording of any maps or plats. Street names and building numbers shall conform to the established grid system(s) in the City. No new street name shall be used that will duplicate or be confused with the name of existing streets in the City.
- 302.06.B** New signage shall be installed by the Developer. A "signage and striping plan" shall be included with plan submittals for new street construction and approved by the City Engineer.



303 STREETS

303.01 STREET IMPROVEMENTS AND RIGHT-OF-WAY DEDICATIONS

303.01.A All street improvements and right-of-way dedications shall comply with the requirements of SMC Chapter 12.04, SMC Chapter 12.08, SMC Chapter 17.26, and the Stayton Transportation System Plan,

303.01.B Extent of Street Improvements (SMC Chapter 12.04.110)

1. If a street improvement is to be constructed on a new street and the owner also owns the property on the opposite side of the street, the owner shall improve the street for its entire width and extending at least the total frontage of the lot to be improved.
2. If the opposite side of the street of a lot to be improved is in different ownership, the street improvement shall be 3/4-street improvement, as defined in Section 303.02 "Partial-Width Street Improvements" below.

303.01.C Final asphalt concrete pavement sawcut lines for all street improvements will be those established by the City Inspector with the Design Engineer and Contractor during construction.

303.02 PARTIAL-WIDTH STREET IMPROVEMENTS

303.02.A Partial-width street improvements will be required where the street is unimproved along the frontage to be developed and/or where an existing street is substandard unless waived or deferred in accordance with SMC Chapter 12.04 by the Public Works Director. The required right-of-way and partial-width street improvements will be as determined by the City Engineer.

303.02.B A development with frontage improvements required on an unimproved or substandard street, as determined by City Engineer, will be responsible for constructing a continuous (min 27-foot), 3/4-street improvement to a connection with the nearest standard (publicly-maintained) street. 3/4-streets will also be required when the abutting or opposite frontage property is undeveloped and the full improvement will be provided with development of the abutting or opposite (upon right-of-way dedication) frontage property.

303.02.C A development with frontage improvements required on an existing street that is determined by the City Engineer to be substandard will be responsible for constructing a continuous 1/2-street improvement, unless otherwise directed by the City Engineer. If a pavement design, including an analysis of the existing pavement section, indicates that the existing pavement is adequate to provide a minimum of twenty (20) years design life, then that pavement may remain (or be overlaid if required by City Engineer). Additional improvements such as curb and pavement widening will be required. If the existing pavement analysis indicates that the existing pavement is inadequate, then either a 1/2-street or 3/4-street full length pavement section replacement, as described above, will be required.

303.02.D Where a 3/4-street improvement is required, the right-of-way and pavement width will be determined by the City Engineer. The pavement width shall be at least 3/4 of the standard street classification width, but in no case will the pavement width be less than that required to provide two (2) lanes of traffic to pass at a safe distance. For a 34-foot local street, the 3/4-street pavement width shall be 27-feet. 3/4-street improvements shall be signed "No Parking" on the improved (curb) side of the street and, if necessary, the unimproved side of the street to provide a clear-traveled way of 20-feet.



- 303.02.E** Designs for a 3/4-street improvement shall consider the entire future street improvement so that related facilities, grades, slopes, utility stub-outs, future curb inlets, future service lines, potential conflicts, and other issues will be identified. The 3/4-street improvement shall be designed so that future completion of the street and related facilities can be easily coordinated with the initial 3/4-street improvement and minimize damage to the street structure. Construction plans shall clearly show the paving limits for the 3/4-street improvement.
- 303.02.F** If the curb and gutter on the side of the street not being constructed is anticipated to be at different grade than the curb and gutter that will be constructed, the construction plans shall clearly show the future curb and identify all items that are to be constructed by others in the future. The profile view will include the bottom of the ditch or swale constructed on the side without curb and gutter, and shall show all culverts, drain pipes, drainage inlets, and drainage outlets.

303.03 DEAD-END STREETS

- 303.03.A** A standard cul-de-sac shall be provided at the end of a permanent dead-end street that does not provide looped circulation, unless directed otherwise by the City Engineer. Cul-de-sacs shall be limited to service no more than 250 ADT, shall not exceed 450-feet in length to the end of the bulb, and shall meet all Stayton Municipal Code requirements. The length of a cul-de-sac shall be measured from the right-of-way line of the adjacent street to the face of curb located at the furthest end of the cul-de-sac.
- 303.03.B** Standard local residential street cul-de-sacs shall have a minimum right of way radius of 48 feet and have a 41.5-foot bulb radius to the face of curb. A 60' right-of-way with a bulb radius to face of curb as determined appropriate by the Design Engineer to accommodate anticipated truck turning radii (45-foot minimum), is required for all other street classifications. Parking will not be permitted within the cul-de-sac bulb or within the reverse curve transition areas. See the Standard Drawings.
- 303.03.C** The use of a hammer-head turnaround in lieu of a cul-de-sac is not allowed for permanent dead-end streets, unless specifically approved by the City Engineer.
- 303.03.D** Temporary dead-end streets (that will be extended in the near future), where specifically approved by the City Engineer, less than or equal to 150 feet long, shall be terminated with proper signing and installation of a street barricade, as shown in the Standard Drawings. Temporary dead-end streets over 150 feet long are required to end with a cul-de-sac.

303.04 PRIVATE STREETS

- 303.04.A** When private streets are allowed in development, such as for condominiums and apartments, the private streets shall be built to local residential street standards and meet all Stayton Municipal Code requirements. Private streets shall comply with the Fire Code for fire apparatus access requirements.
- 303.04.B** A hammer-head turnaround shall be provided at the end of a private street that does not provide looped circulation. Hammer-head turnarounds that are less than or equal to 150 feet long shall consist of two rectangular turnouts directly opposite each other and oriented perpendicular to the street centerline, as shown in the Standard Drawings. Hammer-head turnarounds over 150 feet long shall meet the City and Fire District access, turn-out, and turnaround requirements. "NO PARKING" signs are required within the access and easement limits of the hammer-head turnaround area.
- 303.04.C** A "PRIVATE STREET" sign and driveway approach shall be placed at the intersection with the public street to clearly identify the private street.



303.04.D Documents defining ownership, use rights, and allocation for liability for maintenance shall be submitted to the City prior to or in conjunction with final approval. The City will have no maintenance responsibilities for private streets.

303.04.E The City will not consider any requests for private streets to become a public street under City jurisdiction.

303.05 DESIGN SPEEDS

303.05.A Design considerations for all street geometrics shall be based on the minimum design speeds shown below for each street classification. Variance from these design speeds may be required based upon topography or other considerations. Variance from these design speeds will require approval of the City Engineer.

303.05.B Design speeds for the City street classifications shall be as follows:

Street Classification	Design Speed
Major Arterial (Limited Access Facility) ¹	Posted speed plus 10 mph (min 45 mph)
Major Arterial	Posted speed plus 10 mph (min 35 mph)
Collector	Posted speed plus 10 mph (min 30 mph)
Neighborhood Collector	Posted speed plus 5 mph (min 25 mph)
Local Street	Posted speed plus 5 mph (min 25 mph)
Alleys	15 mph

¹This standard applies on Cascade Highway north of Shaff Road and on S First Avenue south of Water Street.

303.05.C Design speed is the maximum safe speed that can be maintained over a specified section of roadway when traffic, weather, and other conditions are so favorable that the design features of the roadway govern. The City Engineer may approve a lower alternative design speed where it can be shown that the 85th percentile speed of traffic will be lower than the design speed standard during all hours. The design speed is the minimum speed that shall be used in design of safe road geometry. The design speed shall not prohibit the use of traffic calming features or signing, where appropriate, to encourage lower traffic speeds.

303.06 SIGHT DISTANCE AND CLEARANCE AREAS

303.06.A GENERAL

1. Sight distance is unobstructed distance of roadway ahead visible to the driver. There are multiple types of sight distance that include stopping sight distance, passing sight distance, decision sight distance, and intersection sight distance. It is critical that sight distances be properly developed and applied to the design of projects.
2. Sight distance shall be checked when designing slopes and retaining walls or where median barriers, structure screening or screen plantings are used. Combinations of slight horizontal curvature with crest vertical curves may seriously diminish sight distance where high curb or planting is used. Slopes, walls, and other side obstructions shall be set back from the pavement edge to provide at least minimum stopping sight distance for a driver in the traffic lane nearest the obstruction. The possibility of future conversion of shoulders to driving lanes should be considered.



3. Intersections at grade shall be provided with at least minimum stopping sight distance and intersection sight distance for the design speed. Sufficient sight distance should be provided so that the entering vehicle may cross or make a turn without significant slowing of the through traffic.
4. Sight distances shall be designed in accordance with the most current version of the AASHTO "A Policy of Geometric Design of Highways and Streets" and the Stayton Municipal Code, Title 8 and Title 17.

303.06.B STOPPING SIGHT DISTANCE

1. It is the policy of the City of Stayton to have the Design Engineer evaluate safe stopping sight distances using the principles and methods recommended by AASHTO. This policy shall apply to the design of streets and driveways, and to the placement of any object in the public right-of-way, including landscaping features.
2. The minimum stopping sight distance shall be measured from a height of 3.5 feet to a target on the roadway nominally 6 inches in height.
3. The following table is for minimum stopping sight distances:

Design Speed (mph)	Minimum Stopping Sight Distance (Feet)
25	155
30	200
35	250
40	305
45	360
50	425

Source: SMC, Table 17.26.020.4.b

4. No modifications or exceptions will be allowed without approval of the City Engineer.

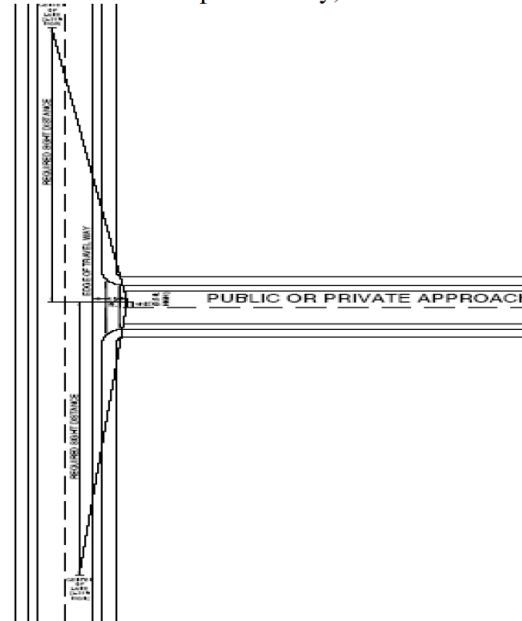
303.06.C INTERSECTION (AND DRIVEWAY) SIGHT DISTANCE

1. It is the policy of the City of Stayton to have the Design Engineer evaluate safe intersection sight distance using the principles and methods recommended by AASHTO. This policy shall apply to the design of streets and driveways, and to the placement of any object in the public right-of-way, including landscaping features.
2. Stayton Municipal Code (SMC 17.04) defines the sight distance triangle as the distance from an intersection of a public or private road to the nearest access connection, measured from the closest edge of the pavement of the intersecting road to the closest edge of the pavement of the connection along the traveled way.
3. The intersection and driveway sight distance is measured from an eye height of 3.5 feet above the controlled road at least 15 feet from the edge of the vehicle travel lane of the uncontrolled public road to an object height of 4.25 feet on the uncontrolled public road. For driveways along local access roads in urban and residential areas, the sight distance triangle is measured along the property lines of the street and along the driveway.



4. Uncontrolled intersections at local access roads in urban and rural residential areas shall have an unobstructed sight distance triangle of 30 feet along the property lines of both intersection approaches. Any vegetation within the sight distance triangle must be 24 inches in height or less. For driveways, the sight distance triangle along the driveway and property line adjacent to the public street shall be a minimum of 10 feet for each leg. Requirements regarding sight clearance areas in SMC 8.04.060 and SMC 8.04.130 shall also be met (SMC 17.26.020.4.d).

Sight Distance Triangle
(For Illustrative Purposes Only)



5. Sight distance shall be determined for each street approach to an intersection. A driver on the approach street should be able to see each vehicle on the intersecting street from the time that the vehicle is the sight distance from the intersection until the time that the vehicle reaches the intersection. Poles, trees, and similar obstructions will be allowed within the sight distance area only if it can be shown that such obstructions do not prevent the continuous view of the vehicle approaching on the intersecting street. See Subsection 303.06.D for Sight Clearance Areas.
 - a. Preliminary intersection site distance verification shall be submitted with the design submittals for review and approval. The intersection site distance shall be certified and stamped by the design engineer after completion of the construction and submitted with the final project documentation.
6. In some locations, maintenance of the required sight distance may require restrictions to potential development outside the public right-of-way. If so, the Design Engineer shall demonstrate that adequate restrictions are in place (and enforceable by the City) to assure that the required sight distance can be maintained in the future.



7. The following table is for minimum intersection and driveway sight distances:

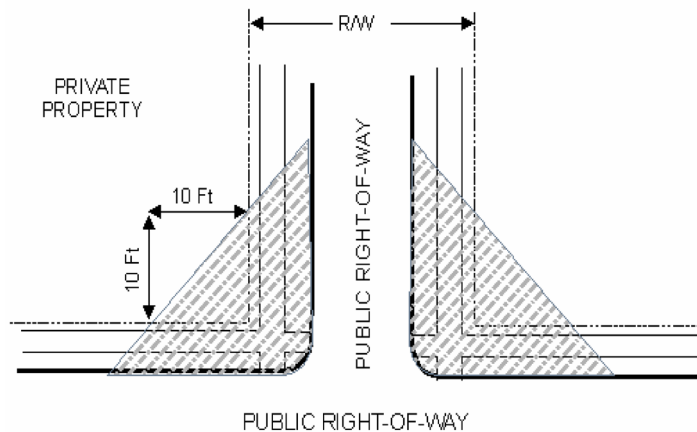
Design Speed (mph)	Minimum Intersection/Driveway Sight Distance (Feet)
20	200
25	250
30	300
35	350
40	400
45	450
50	500

Source: SMC, Table 17.26.020.4.c

8. No modifications or exceptions will be allowed without approval of the City Engineer.

303.06.D SIGHT (VISION) CLEARANCE AREAS

1. Work within the public right-of-way and adjacent to public streets and multi-use paths shall not have fences, berms, walls, commercial signs, vehicles, hedges, off-street parking spaces, or other planting or structures erected, planted, placed, or maintained within a sight clearance area. If the relation of the surface of the lot to the streets is such that visibility is already obscured, nothing shall be done to reduce visibility within the sight clearance area.
2. The horizontal limits of the sight (vision) clearance area shall be a triangular area measuring 10 feet along the right-of-way or private access, as shown in the following diagram. The edge of the hard surfaced area of the private access, be it roadway, curb, or sidewalk, shall be treated as the right-of-way line in determining the sight (vision) clearance areas.



3. The sight (vision) clearance areas shall not contain temporary or permanent obstructions to vision exceeding 24 inches in height above the curb level or street shoulder where there is no curb, except a supporting pillar or post not greater than 12 inches in diameter or 12 inches on the diagonal of a rectangular pillar or post; and further excepting utility poles and those posts, poles, tree trunks, street signs, streetlights, and traffic control signs (SMC 8.04.060.3.b).
4. Sight (vision) clearance shall not be required at a height 7 feet or more above the curb level or 7 feet 6 inches above the shoulder of a street that does not have curbs (SMC 8.04.060.3.c).



5. No modifications or exceptions will be allowed without approval of the City Engineer.

303.07 HORIZONTAL DESIGN

303.07.A GENERAL

1. The horizontal design of streets shall produce a safe street network while also considering the need for creating livable neighborhoods. Consideration should be given to minimizing long tangent sections and other elements that might induce high speeds or other problems that may require mitigation in the future. Traffic calming measures shall be considered in the design of new streets and shall be incorporated, as required by the City Engineer.
2. Sharp horizontal curvature shall not be introduced at or near the top of a pronounced crest vertical curve. Similarly, sharp horizontal curvature shall not be introduced at or near the low point of a pronounced sag vertical curve.

303.07.B MINIMUM CURVE RADIUS

1. Horizontal curve radius (on centerline) for each street classification shall be designed according to the roadway design speed. The radius shall not be less than the following:

Design Speed (MPH)	Minimum Radius (Feet)
15	100
25	180
30	300
35	450
40	670
45	900

2. "Loop" roads and other traffic-calmed local roads that are designed to "self enforce", lower speeds may use centerline radius as low as 50-feet with the City Engineer's approval. Such roads shall be limited to low density, residential developments with a maximum number of fifty (50) dwelling units and five-hundred (500) ADT. Maximum distance between speed control points shall be 500-feet. Speed control points include horizontal curves of 50-feet to 100-feet, traffic circles, textured pavement sections, or other similar traffic calming devices. Use of speed bumps is discouraged.

303.07.C TAPER AND TRANSITION RATES

1. Criteria listed below shall be used to determine the minimum taper length to increase lane width, create a new lane, or transition traffic lanes laterally. The City Engineer may require a longer taper length. Tapers in traffic calming improvements may be shorter in order to meet traffic calming goals.



Type of Taper	40 mph or less	45 mph or greater
Merging Taper	$\frac{WS^2}{60}$	WS
Shifting Taper	$\frac{WS^2}{120}$	$\frac{WS}{2}$

Where, W = Width of offset in feet.
 S = Posted speed limit or anticipated speed in mph.

303.07.D INTERSECTIONS

1. GENERAL

- a. Connecting street intersections shall be located to provide for traffic flow, safety, and turning movements as conditions warrant. Where signalized, design shall provide for optimal signal phasing. Consideration shall be given for arterial street progression, protected/permitted, and permitted left turn phasing. New signal proposals in remote locations shall first include an evaluation of alternate applications such as roundabouts.
- b. Streets shall be aligned so as to intersect at right angles (90 degrees). Angles of less than 70 degrees will not be permitted. Intersection of more than two (2) streets at one point will not be permitted.
- c. For Arterials and Collector intersections, exclusive left turn lanes shall be provided; crosswalks shall be provided at all approaches; and street alignments across intersections shall be continuous.
- d. Street and intersection alignments should facilitate local circulation but avoid alignments that encourage non-local through traffic for Neighborhood Collector and Local Street intersections.
- e. New streets shall intersect with existing street intersections so that centerlines are not offset, except as approved by City Engineer. Where existing streets adjacent to a proposed development do not align properly, conditions may be required of the development to provide for proper alignment.

2. INTERSECTION SPACING

- a. Access spacing between streets and between streets and driveways (> 50 feet) shall be measured from center-to-center of the driveway or street (SMC 17.26.020.3.h).
- b. The access spacing standards for full intersection spacing shall meet the following minimum separation distance:



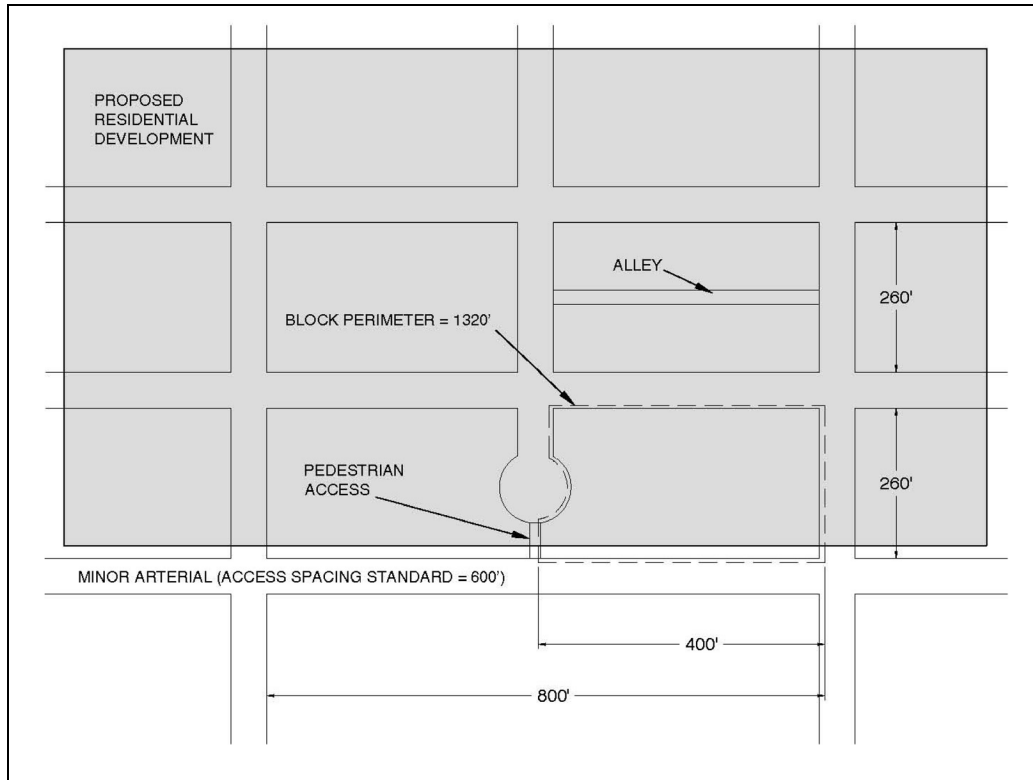
Street Classification	Minimum Public Intersection Centerline Spacing (Feet)
Major Arterial (Limited Access Facility) ¹	750
Major Arterial	260
Minor Arterial	600
Collector	260
Neighborhood Collector	260
Residential Local	260
Commercial Local	260
Industrial Local	260

1. This standard applies on Cascade Highway north of Shaff Road and on S First Avenue south of Water Street.

- c. Intersection spacing of not less than the minimum shown may be allowed on a case-by-case basis when findings presented to the City Engineer indicate that the spacing change is necessary and as determined appropriate by the City Engineer.

303.07.E STREET CONNECTIVITY AND FORMATION OF BLOCKS

- 1. **BLOCK LENGTH AND PERIMETER STANDARD** – In order to promote efficient vehicular and pedestrian circulation throughout the City, subdivisions and site development shall be served by a connecting network of public streets and/or accessways, in accordance with the following standards (minimum and maximum distances between two streets or a street and its nearest accessway measured from right-of-way line to right-of-way line as shown in the figure below (SMC Figure 17.26. 020.5.c.)
 - a. **RESIDENTIAL DISTRICTS** – Minimum 100-foot block length and maximum of 600-foot length; maximum 1,400 feet block perimeter;
 - b. **DOWNTOWN/MAIN STREETS** – Minimum 100-foot block length and maximum of 400-foot length; maximum 1,200 feet block perimeter;
 - c. **GENERAL COMMERCIAL DISTRICTS** – Minimum 100-foot block length and maximum of 600-foot length; maximum 1,400 feet block perimeter;
 - d. **INDUSTRIAL DISTRICTS** – Not applicable.



2. If a hardship can be demonstrated in which it is not practically feasible to meet these standards due to topographical, environmental, or other significant constraints, then these conditions may be requested to be modified through the Public Works Director or his/her designee.
3. At no time shall any block length be greater than 600 feet and its maximum block perimeter 1,800 feet for roadways with urbanized area Major Arterials, Minor Arterials, or lower classification.

303.07.F CURB RETURNS

1. Access to public right of ways shall be identified by a standard curb return with ADA accessible sidewalk ramps. Curb returns shall not be installed on private streets or driveways unless otherwise directed or approved by the City Engineer. See Section 303.09.
2. Curb return radius at street intersections shall be designed to accommodate all expected traffic. Curb extensions and/or special crosswalk/sidewalk features designed to enhance pedestrian safety may be required to encourage pedestrian usage.
3. The minimum allowed curb return radii between intersecting streets are shown below. The minimum radii are based on the lowest classification of the two intersecting streets.



Minimum Curb Return Radii (Feet) Edge of Pavement / Face of Curb					
Street Classification	Arterials	Collector	Neighborhood Collector	Local Street	Alleys
Arterials	35	-	-	-	-
Collector	30	30	-	-	-
Neighborhood Collector	25	25	25	-	-
Local Street	25	25	20	20	-
Alleys	Radii equal to the distance from the face of curb to property line (10' min)				

4. Neighborhood Collectors or Local Streets with heavy truck movements may be required to install larger curb radii than shown in the table. Streets with daily transit routes shall not have curb return radii less than 25-feet to accommodate safe bus turning movements.
5. In areas zoned for industrial uses, the intersection of a Neighborhood Collector or a Local Street with an Arterial or Collector street shall be designed to accommodate a WB-50 Semitrailer Design Vehicle and the curb alignment shall be designed so that the vehicle can complete a right turn using only the vehicle lanes nearest to the curbs of the two streets. The Design Engineer shall provide direction in deciding if other areas need larger than minimum turning radii at specific intersections. When designing turning radii higher than the minimums, the Design Engineer shall identify the design vehicle to be applied.
6. If bicycle lane or on-street parking exists, or when in Special Districts, above turning radii may be reduced by 5-feet, as approved by City Engineer.
7. The minimum gutter grade, including curb returns, shall be 0.5 percent. All curb return data shall be summarized in a table on the plan sheet. The table shall show the total length of the return, delta angle, curb radius distance, and elevations of the beginning, 1/4-delta, 1/2-delta, 3/4-delta, and end of the return.

303.07.G CUT AND FILL SLOPES

1. Catch points for cut and fills shall be shown on the plans so that slope limits outside the right-of-way are identified. The plans shall show the direction of natural drainage and address the routing of runoff to prevent erosion of newly constructed slopes or blockage of the natural drainage.
2. The plans shall show existing slope easements, along with proposed slope easements and temporary construction access agreements that must be acquired to facilitate construction. Easement dimensions shall be shown on the plans.

303.08 VERTICAL DESIGN

303.08.A GENERAL

1. Beginning, ending, centerline-centerline intersections, and sharp grade breaks not exceeding a total of 1 percent shall be identified on the profile with street stations and elevations. Grade



breaks over 1 percent shall utilize a vertical curve. The maximum superelevation rate permitted shall be 4 percent on local and collector streets, and 6 percent on arterial streets.

2. The profile shall show all utility appurtenances such as manholes, curb inlets, culverts, and drainage inlets and outlets. Each item shall be labeled with the station and the finish grade elevation for the rim, top of curb, and all inverts. Pipelines along the street shall be shown in profile as well as the cross section of pipes that cross the construction area.
3. These requirements are for standard conditions anticipated within the City. Areas in which topography may dictate, the City Engineer will entertain alternatives from these Design Standards.
4. When new streets are built adjacent to or crossing drainage ways, the following standards shall govern the vertical alignment:

Street Classification	Vertical Standard
All Street Classifications	Travel lanes shall be at or above the 100-year flood elevation.

5. If alternate access is available for properties served by a particular Local Street, a design could be considered for approval by the City Engineer that would set the travel lanes at or above the 50--year flood elevation, but not lower than 6-inches below the 100-year flood event.

303.08.B LONGITUDINAL GRADES

1. Minimum longitudinal grade for all street classifications shall be 0.0050-feet per foot (0.50%). In all cases street grades shall allow for proper and adequate drainage. Cul-de-sac "bulbs" shall have a minimum slope of 0.0060-feet per foot (0.60%).
2. The maximum longitudinal grades for each street classification shall be as follows:

Street Classification	Slope (ft/ft)	Slope (%)
Major Arterial/Minor Arterial	0.060 ft./ft.	(6%)
Collector	0.080 ft./ft.	(8%)
Neighborhood Collector	0.100 ft./ft.	(10%)
Local Streets	0.120 ft./ft.	(12%)
Alleys	0.120 ft./ft.	(12%)

3. For unsignalized intersections, the longitudinal grade on stop-controlled approaches shall be below 8 percent for an approach distance of 50-feet.
4. Local asphalt concrete paved streets may exceed 12 percent, as approved by the City Engineer, but in no case will they be allowed to exceed 15 percent. The City Engineer may approve a grade greater than 12 percent when all of the following conditions exist:
 - a. Topographic constraints do not allow the development to be served by a street with a maximum longitudinal grade of 12 percent without causing destabilization of soils by excessive cuts and fills.
 - b. There is no access to the property being developed through adjacent properties at a maximum 12 percent longitudinal grade.



- c. The section of local street being designed will not exceed a combination of length, horizontal alignment, or longitudinal grades exceeding 12 percent that will create hazardous traffic conditions.

303.08.C CROSS-SECTION SLOPE

1. GENERAL

- a. Street pavement widening shall have a minimum cross-section slope of 2.0 percent and a maximum cross-section slope of 4.0 percent, unless otherwise approved by the City Engineer. Street pavement widening cross-section slopes and slopes along the curb returns at the intersections shall be verified during design by the Design Engineer. Flow direction arrows and gutter slopes shall be provided on the plan intersection details.

2. ADVERSE TOPOGRAPHY

- a. When approved by the City Engineer, local streets in adverse topography may utilize an "offset" or unequal crown section when the existing ground slope exceeds 8.00 percent across the roadway section. The offset crown design shall meet the following conditions:
 - ❖ Minimum horizontal distance from "crown" to (one) face of curb is 10.00-feet.
 - ❖ Maximum cross-slope of pavement is 5.00 percent, except for horizontal curves. On horizontal curves, maximum reverse super elevation is 2 percent.
 - ❖ Maximum differential in top of curb elevation from one side to the other is 1.00-foot.
- b. The existing ground "side-slope" criteria are based on the relationship of the slope of the ground to the transverse slope of the roadway profile. This relationship shall be met for the entire length of the roadway alignment utilizing an offset crown. Other non-standard cross-sections such as "shed roof", "saw tooth", etc., may also be approved by the City Engineer.

303.08.D VERTICAL CURVES

- 1. Vertical curves shall be parabolic and of a minimum length computed from the formula: $L = KA$
 - ❖ L = Length of vertical curve in feet
 - ❖ K = Design constant (rate of vertical curvature)
 - ❖ A = Algebraic difference in grades in percent
- 2. Selection of K values for crest vertical curves are based on sight distance requirements, and for sag vertical curves on headlight sight distance. K is a constant for each design speed and the values to be used are listed in the table below:

Design Speed (Mph)	K Values for Vertical Curves			
	Crest Vertical Curve		Sag Vertical Curve	
	Minimum	Desirable	Minimum	Desirable
20	10	-	20	-
25	20	-	30	-
30	30	30	40	40
35	40	50	50	50
40	60	80	60	70
45	80	120	70	90



303.09 **BIKEWAYS**

303.09.A **GENERAL**

1. A bikeway is created when a road has the appropriate design treatment to accommodate bicyclists, based on motor vehicle traffic volumes and speed. The basic design treatments used to accommodate bicycle travel on the road are classified as: shared roadway, shoulder bikeway, or bike lane. Another type of facility that is separated from the roadway is multi-use paths, as discussed in Section 310.
2. The City has adopted the "Stayton Bicycle Facility Plan." This plan summarizes the City's policy and implementation strategies for bikeways within the City. The City's adopted guidelines for bikeway design, construction, and control consist of the following:
 - ❖ AASHTO, "Guide to Development of Bicycle Facilities" latest edition.
 - ❖ ODOT, "Oregon Bicycle & Pedestrian Plan" latest edition.
 - ❖ Manual on Uniform Traffic Control Devices with Oregon supplements by Oregon Transportation Commission latest edition.
3. The Geometric Street Design By Functional Classification table attached at the end of this Division outlines specific bikeway requirements for City streets.

303.09.B **BIKEWAY CLASSIFICATIONS**

1. **BIKE LANES**. Bike lanes are a portion of the roadway designated for preferential use by bicyclists. Bike lanes are required on Arterials, Collectors, and other functional classifications as shown in the Geometric Street Design by Functional Classification table. Bike lanes shall be well marked to call attention to their preferential use by bicyclists.
2. **BIKE PATHS**. Bike paths are a designated travel-way for bicyclists that are completely separated from the vehicular travel lanes and are within independent rights-of-way.
3. **SHARED BIKEWAYS (a.k.a. Bike Routes)**. Paved roadway shoulders on rural roadways provide a suitable area for bicycling, with few conflicts with faster moving motor vehicle traffic. Most rural bicycle travel is accommodated on shoulder bikeways.
4. **SHARED ROADWAYS**. On a shared roadway, bicyclists and motorists share the same travel lanes. A motorist will usually have to cross over into the adjacent travel lane to pass a bicyclist. Shared roadways are common on local and neighborhood streets and on rural roads and highways.

303.09.C **BIKE LANE WIDTH**

1. The standard width of a bike lane is 6-feet, as measured from the center of stripe to the face of curb or edge of pavement. This width enables cyclists to ride far enough from the curb to avoid debris and drainage grates, yet far enough from passing vehicles to avoid conflicts. If parking is permitted, the bike lane shall be placed between parking and the travel lane
2. If the standard width is not practical because of physical constraints, then a minimum width of 4-feet may be designated as a bicycle lane where approved by the City Engineer on a case-by-case basis. Bike lanes against a curb face, guardrail or other roadside barriers shall have a minimum 5-foot width or shall be minimum 4-feet from the longitudinal joint between a monolithic curb and gutter and the edge of travel lane. The minimum bike lane width between parking and the travel lane is 5-feet.



3. Bike lanes wider than 6-feet may be desirable in areas of very high use, on high-speed facilities where wider shoulders are warranted, or where they are shared with pedestrians. Care must be taken so they are not mistaken for a motor vehicle lane or parking area, with adequate marking or signing.
4. A bike lane shall be properly marked with pavement stencils and an 8-inch wide stripe in accordance with the ODOT, "Oregon Bicycle & Pedestrian Plan" latest edition, and as required by OAR 734-20-055.

303.10 ON-STREET PARKING

1. On-street parking requirements per street classification shall be in accordance with the Geometric Street Design By Functional Classification table attached at the end of this Division, unless approved otherwise by the City Engineer.
2. On-street parking will not be allowed within City right-of-ways in the areas shown below unless otherwise approved by the City Engineer. "No Parking" areas shall be clearly identified, marked, and/or signed appropriately on the plans.
 - ❖ Within 45-feet of a curb return for Arterials and Collectors; and
 - ❖ Within 30-feet of curb return for Local Streets and Neighborhood Collectors; and
 - ❖ Within the radius of cul-de-sac turnarounds; and
 - ❖ Within alleys
3. Local streets that are approved for reduced 45-foot right-of-way and 28-foot pavement section (skinny streets) are required to have one parking lane to assure that on-street parking is adequate for adjacent uses. In addition, local skinny street designs shall consider clustered parking bays adjacent to the street if needed.

303.11 DRIVEWAYS

303.11.A GENERAL

1. Access to private property shall be identified by the use of driveway curb cuts where curbs exist and with asphalt pavement connections where no curbs exist. Access to public right of ways shall be identified by a standard curb return. Commercial driveways shall not use a standard curb return without prior approval of the City Engineer.
2. Driveway access points within the street shall be the minimum necessary to provide access while not inhibiting the safe circulation and carrying capacity of the street. Driveways shall meet applicable guidelines of the Americans with Disabilities Act (ADA), Title 17 of the Stayton Municipal Code, and conform to the requirements of the transportation impact analysis for the particular development.
3. Driveways providing access into off-street, surface parking lots shall be designed in such a manner to prevent vehicles from backing into the flow of traffic on the public street or to block on-site circulation. The driveway throat approaching the public street shall have adequate queue length for exiting vehicles to queue on-site without blocking on-site circulation of other vehicles. The driveway throat approaching the public street shall also have sufficient storage for entering traffic not to back into the flow of traffic onto the public street.
4. Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration lanes, deceleration lanes, or tapers shall be prohibited due to the potential for vehicular weaving conflicts unless there are no other alternatives for driveway locations. Only after a transportation impact study is conducted



and concludes that the driveway does not create a safety hazard along acceleration lanes, deceleration lanes, or taper shall the driveway be considered for approval. Approval of a driveway location along an acceleration lane, deceleration lane, or taper shall be based on the Public Works Director or his/her designee agreeing with the conclusions of the traffic impact study.

5. Driveway shall be shown on the plans to verify that the design meets minimum ADA requirements for sidewalks. Design elements shall consider adequate clear space for passage behind the approach ramp and/or proper slope of the depressed curb transition with curbside sidewalk.
6. Residential curb cuts shall be a minimum distance from adjacent property lines such that driveway curb wings and ramped sidewalk do not encroach on adjacent properties. Exceptions are allowed for shared driveways or when the lot is platted as a zero lot line or as an attached single-family lot.
7. Within commercial, industrial, and multi-family areas, shared driveways and internal access between similar uses are encouraged to reduce the access points to the higher classified roadways; to improve internal site circulation; and to reduce local trips or movements on the street system. Shared driveways or internal access between uses shall be established by means of common access easements at the time of development.

303.11.B NUMBER OF ALLOWED DRIVEWAYS

1. The number of allowed driveways shall comply with the requirements of SMC 17.26.020.2.

303.11.C DRIVEWAY ACCESS LOCATIONS

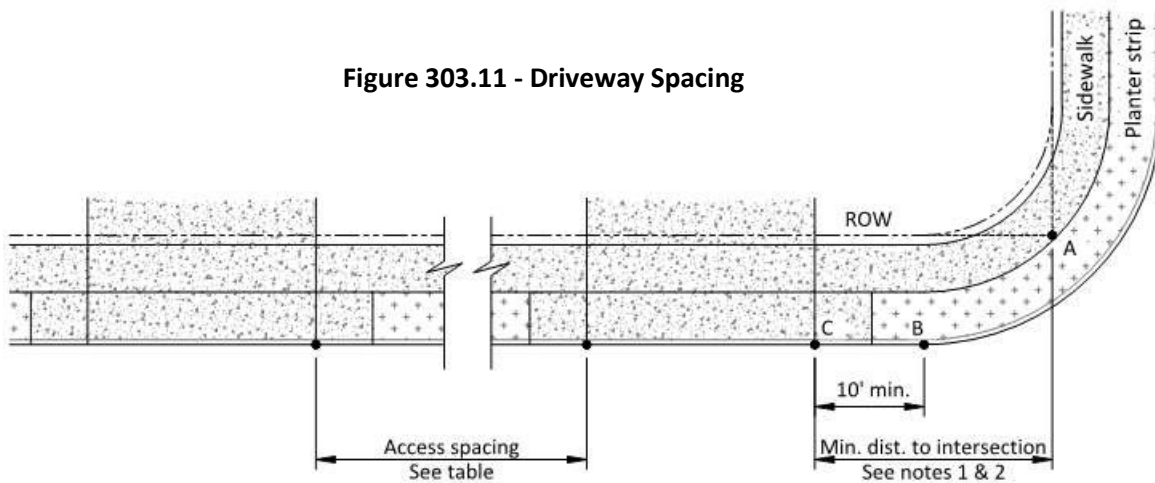
1. Driveway access locations shall comply with the requirements of SMC 17.26.020.3.

303.11.D DRIVEWAY SPACING

1. Access spacing standards shall be measured as defined below (SMC 17.26.020.3.h.).
 - a. Access spacing between two driveways on Neighborhood Collector and Local Streets (50 feet) shall be measured from the perpendicular near edge of the driveway to the perpendicular near edge of the driveway. See figure 303.11.
 - b. Access spacing between a driveway and an Arterial, Collector, or Local Street (50 feet) shall be measured from the perpendicular near edge of the driveway to the the point of intersection for the intersecting street. See figure 303.11



Figure 303.11 - Driveway Spacing



Notes to Figure 303.11:

1. The edge of driveway (Point C) shall be located no less than 50' from the point of intersection (Point A) of right-of-way lines at intersection with adjacent roadway.
2. The edge of driveway (Point C) shall be located no less than 10' from the point of curvature of the curb (Point B) adjacent to any intersection.

2. The access spacing standards for driveway spacing shall meet the following minimum separation distance:

Street Classification	Minimum Access Spacing between Driveways and/or Streets and Driveways (Feet)
Major Arterial (Limited Access Facility) ¹	375
Major Arterial	260
Minor Arterial	300
Collector	150
Neighborhood Collector	50
Residential Local	50 ²
Commercial Local	50
Industrial Local	50

1. This standard applies on Cascade Highway north of Shaff Road and on S First Avenue south of Water Street.
2. This standard only applies to a corner residential lot driveway spacing from the adjacent street and may be modified per SMC 17.26.020.3.a.

3. The City Engineer may permit a spacing of less than the minimum shown, when findings are made to establish that without the change there could be no public street access from the parcel(s) to the existing street; or the change is necessary to support local pedestrian/bicycle circulation and access; and/or the change is necessary due to topographic constraints; and all other provisions of the street design requirements can be met.



303.11.E DRIVEWAY WIDTH

Driveway Width (Min/Max in feet)			
Street Classification	Zoning Designation		
	Residential	Commercial	Industrial
Major Arterial	N/A ¹	12/36	12/36
Minor Arterial	12/24 ²	12/36	12/36
Collector	12/24 ²	12/36	12/36
Neighborhood Collector	12/24 ²	12/36	12/36
Local Street	12/24 ²	12/36	12/36

1. *Special conditions may warrant access, as approved by the City Engineer.*
2. *28-foot maximum with 3-car garage (3 bays wide), as approved by the City Engineer.*

303.12 SIDEWALKS

303.12.A GENERAL

1. Dimensions and spacing of sidewalks, sidewalk ramps, etc., shall be within the parameters of the Stayton Municipal Code, the Standard Construction Specifications, and the Americans with Disabilities Act (ADA) "Proposed Right-of-Way Accessibility Guidelines (PROWAG)" of the U.S. Access Board. Show sidewalk ramps on the plans at each intersection curb return and other required locations to verify adequate landing and passage area. Identify sidewalk obstructions on the plans and verify adequate clear space for passage.
2. Sidewalks shall be constructed with a continuous passage of all obstructions, including poles, mailboxes, signposts, etc a minimum of 4-feet for Local Streets and neighborhood Collectors and 5-feet wide for major collectors and arterials. See the Standard Drawings. A 7-foot vertical clearance above the sidewalk shall be maintained.
3. Sidewalk Location.
 - a. Property Line Sidewalks: Property line sidewalks shall be used unless an exception is granted by the Public Works Director. Sidewalks shall be buffered from the roadway to provide for the safety and comfort of pedestrians (property line sidewalks) and shall be installed such that the back of walk is 12-inches inside the right-of-way, except in cases where buildings abut the right-of-way in which cases the sidewalk will abut the building.
 - b. Exceptions:
 - 1) Curblinewalk: A curblinewalk may be used only when the property line sidewalk configuration will match the location of adjacent sidewalks and/or is appropriate for the particular situation, as determined by the Public Works Director.
 - 2) Curblinewalk: A curblinewalk will be used in all cul-de-sacs.
 - 3) Meandering Sidewalks: Sidewalks may meander within the dedicated right-of-way or outside of the right-of-way within an easement if prior approval is granted by the Public Works Director.



- 4) Sidewalks shall have a design cross slope of 1.50 percent with a maximum constructed cross slope no greater than 2 percent (1V:50H).
- 5) Handrails, fences, and/or other approved means to protect pedestrians will be required when there is a vertical drop of 30-inches or greater adjacent to sidewalk or property line. The vertical drop measurement shall be measured two (2) feet from face of the wall. Finish grading along sidewalks shall not be steeper than a 1-foot vertical in a 5-foot horizontal distance adjacent to a sidewalk unless otherwise approved by the City Engineer.
- 6) All required sidewalk improvements shall be completed to the full required sidewalk width up to the property lines, with the transitions to the existing sidewalks being made after the property lines. Existing sidewalks shall be sawcut and removed at the nearest existing tooled joint located past the property line. Any structures that are approved by the City Engineer to remain within sidewalks shall be suitable for sidewalk applications and the lids shall be set flush and plumb with the sidewalk finish grade. Lids shall be a nonskid pedestrian friendly lids with surfacing that complies with ADA guidelines.

303.12.B SIDEWALK WIDTH

1. Sidewalk width requirements per street classification shall be in accordance with the Geometric Street Design By Functional Classification table attached at the end of this Division, unless approved otherwise by the City Engineer.
2. On local streets, the Public Works Director may approve the replacement of an existing 4-foot wide sidewalk and may permit construction of a 4-foot wide sidewalk to extend or in-fill an existing 4-foot sidewalk when conditions do not warrant construction of a wider sidewalk. The sidewalk shall maintain a minimum 4-foot passage without obstruction.
3. At cul-de-sacs, the sidewalk shall be 6-foot in width.

303.12.C SIDEWALK RAMPS

1. GENERAL
 - a. New street intersections shall incorporate two (2) sidewalk ramps per corner, unless approved otherwise by the City Engineer. Retrofits may be allowed to incorporate a single diagonal ramp that line up with existing ramps when specifically approved by the City Engineer.
 - b. Where sidewalk ramps are non-existent in existing sidewalks opposite the ramps installed as part of new frontage construction, new ramps shall be constructed on the other side of the street in addition to the new ramps constructed as part of the frontage, unless approved otherwise by the City Engineer.
 - c. Sidewalk ramps shall meet applicable guidelines of the Americans with Disabilities Act (ADA) "Proposed Right-of-Way Accessibility Guidelines (PROWAG)" of the U.S. Access Board. All sidewalk ramp forms shall be field verified by the Design Engineer prior to construction.
 - d. Locations of sidewalk ramps shall be designed with regard to stormwater flows, street grades, pole and fire hydrant locations, and pedestrian safety. Other factors may also dictate final sidewalk ramp location.



303.13 CONCRETE CURB AND GUTTERS

- 303.13.A** Street improvements shall be constructed with monolithic curb and gutter, except as specifically approved by the City Engineer.
- 303.13.B** Standard curb as shown in the Standard Drawings may only be used when the longitudinal street grade is 0.01-foot per foot (1.0 percent) or greater and where cross slope of roadway drains away from curb such as with raised median construction.
- 303.13.C** Where a local street pavement section is designed for adverse topography in conformance with Section 303.08.C.2, curb and gutter shall be used on upper side of street to channel roof drainage or curb weeps to catch basins. This will reduce or eliminate stormwater that would tend to flow across the street resulting in slick driving and walking surfaces.



304 ALLEYS

304.01 GENERAL

- 304.01.A** Alleys allow for efficient lot use, support front yard pedestrian orientation and landscape spaces, and reduced lot coverage by driveways. Alleys serve as a common driveway for access and deliveries.
- 304.01.B** Alleys may be used within residential subdivisions but cannot be used in the maximum block perimeter calculation. The maximum alley length is 600 feet between ties to public streets. Midblock access(s) to alleys must align with existing or planned public streets (SMC 17.26.020.5.c).
- 304.01.C** Design for alleys shall meet the same criteria as other public streets. Centerline radius and design speed may be the exception to those criteria when approved by the City Engineer. Generally, alleys shall be designed for one-way.
- 304.01.D** Alleys shall be continuous from one street to a parallel or intersecting street. All lots must have frontage to a public street. If there are parking restrictions on the public street, additional parking spaces shall be provided off of the alley.
- 304.01.E** The standard design for alleys shall consist of 15-feet of asphalt concrete pavement section within a minimum 16-foot public right-of-way. Portland Cement Concrete (PCC) is allowed as approved by the City Engineer. See Standard Drawings for typical alley section.
- 304.01.F** The minimum pavement structure shall be 4-inches of asphalt over 10-inches of base rock, placed over geotextile fabric, as shown in the Standard Drawings. For alleys subject to industrial or special loading considerations or if required by the City Engineer, a structural pavement design shall be calculated to determine if additional thickness is required for the anticipated loading.
- 304.01.G** Private improvements that will be impacted including garages or other structures, stairs, vaults, fences, walls, driveways, parking lots, walkways, or other items shall be shown on the plans. Indicate existing drainage patterns and show private drainage inlets, outlets, and pipes beyond the alley right-of-way that will be impacted by the alley construction.
- 304.01.H** For PCC pavements, the alley joints may be placed full width in one pour, with no longitudinal joints or as shown in the Standard Drawings. The alley design shall include a transverse joint pattern, shown on the plans, so that the joints are spaced to create panel lengths that is 0.75 to 1.25 times the alley width. The joint pattern will be coordinated to intersect with utility features such as poles, manholes, and catch basins. At catch basins, a transverse joint shall be placed at each end of the catch basin to control cracking at the corners of the frame.
- 304.01.I** Alley approaches shall be constructed as a curb return approach with the PCC structural section increased to 10-inches or match the alley PCC pavement structure for which it provides access, whichever is greater. Alley approaches shall have a standard curb return radii equal to the distance from the face of curb to property line (10' min), unless approved otherwise by the City Engineer.



305 PAVEMENT DESIGN

305.01 GENERAL

- 305.01.A** Standard pavement structures for Asphalt Concrete (AC) and Portland Cement Concrete (PCC) pavements are defined in the Standard Construction Specifications and Standard Drawings. All streets and alleys shall be constructed with AC Pavement. It is the City's policy to only allow PCC pavements in alleys and in new subdivisions with all new utilities installed prior to street construction. Design requirements and procedures are summarized in the appropriate sections below.
- 305.01.B** The City has a standard structural section for local streets and collectors shown in the Standard Drawings. Arterial streets shall undergo a full structural section design but shall not be less than the minimum standard shown in the Standard Drawings. Design inputs shall consider soil characteristics, traffic loading data, and structural strength coefficients of the pavement materials. The PCC structural pavement design shall apply to both street and alley pavements. The City Engineer may require a structural pavement design to be generated when it is suspected that unsuitable soil conditions, high percentage of trucks, or any other condition may require the pavement structure to be increased.
- 305.01.C** The design shall be based on a geotechnical investigation to determine soil characteristics, structural strength coefficients for the soil, and traffic loading data approved by the City. The design shall be submitted for review with all supporting documentation and calculations for the structural design of the pavement. Any modification to the standard minimum pavement structure must be approved by the City Engineer.

305.02 SOIL CHARACTERISTICS

- 305.02.A** The structural characteristics of existing native soils underlying the proposed street shall be assumed to be fair or may be specifically established by a geotechnical engineer. The classification of soil and corresponding ability to support the proposed street structure and anticipated loading is common to both AC and PCC pavement designs. The structural characteristics for treated or reprocessed materials used in the pavement design shall be established by a geotechnical engineer and documented in the design calculations provided by the Design Engineer.
- 1. NATIVE MATERIALS** – If a geotechnical study is not undertaken, the native material classification shall be assumed to be fair. A soil classified as fair is typified as having values for the resilient modulus (MR) of 5,000 psi or other equivalent designation. For designs that assume fair soils, this value shall be used.
 - 2. SUBGRADE STABILIZATION** – Any part of the subgrade that is found to be inadequate shall be stabilized to establish a new subgrade structure equivalent to the native subgrade under dry summer conditions. Rock used to replace all or a portion of the subgrade shall not be used to reduce the pavement thickness.
 - 3. EXISTING STREET STRUCTURE** – Whenever a street is to be constructed to a new grade or alignment such as the new street section is built over an existing street structure, any existing pavements shall be broken up and removed, unless otherwise approved.



305.03 TRAFFIC DATA

305.03.A Traffic loading data for the pavement design shall be determined for all arterial, collector, and nonresidential local streets using current and 20-year future traffic volumes. The data shall include a vehicle classification breakdown for passenger cars, buses, and 2, 3, 4, and 5-axle trucks. The volumes shall be provided in the form of Average Daily Traffic (ADT) so that loading factors can be determined by converting to standard 18,000 pound equivalent axle loads (EAL) for each vehicle class, and summing to determine the total traffic load.

305.03.B Traffic data shall be submitted by a licensed engineer for the City's approval, or may be provided by the City if data is available. Traffic data from the City is limited to information that is readily available from existing traffic counts or based on the Transportation System Plan.

305.04 ASPHALT CONCRETE PAVEMENT

305.04.A GENERAL

1. Streets shall be constructed with asphalt concrete (AC) pavement; however, other materials such as Portland Cement Concrete (PCC), concrete paver stones, etc., may be permitted only as approved by the City Engineer.
2. Design of the AC pavement structural section shall follow the latest edition of Asphalt Pavement Association of Oregon (APAO) Asphalt Pavement Design Guide or the ODOT pavement design guide. Pavement structures shall be based on a 20-year design traffic-loading period with 90 percent reliability.
3. Street design shall take into account the topography and include subsurface drains as required.

305.04.B MINIMUM STRUCTURAL SECTIONS

1. GENERAL

- a. The following minimum structural sections may be modified if the Design Engineer performs a full structural design calculation that is acceptable to the City Engineer. The thickness of the crushed granular base rock shall not exceed 15-inches.
- b. The maximum thickness for any lift of AC pavement shall be 3-inches and the minimum thickness shall be 2-times the maximum aggregate size or 1 1/2-inches, whichever is greater. Delays of final lifts will not be allowed.
- c. The minimum structural sections assume that construction will take place during dry summer conditions. If construction takes place outside of dry summer conditions, measures shall be taken to stabilize all poor performing subgrade soils.
- d. Geotextile fabric shall be used to protect the crushed granular base rock from contamination with soil particles and preserve the structural integrity of the aggregate during the service life of the pavement. The geotextile fabric has no strength coefficient for purposes of determining the pavement structure.

2. PRIVATE STREETS

- a. The pavement section shall be designed to Local Street standards.



3. LOCAL STREETS

- a. The minimum structural section for new or reconstructed local residential streets shall consist of 4-inches of AC Pavement over 10-inches of 1-inch crushed granular base rock over stable subgrade.
 - 1) The pavement section shall consist of a 2-inch base lift of Level 2, 1/2" Dense AC, and a 2-inch surface lift of Level 2, 1/2" Dense AC.
- b. The minimum structural section for new or reconstructed Commercial Local or Industrial Local shall consist of 5-inches of AC Pavement over 12-inches of 1-inch crushed granular base rock over stable subgrade.
 - 1) The pavement section shall consist of one, 3-inch base lift of Level 3, 1/2" Dense AC, and a 2-inch surface lift of Level 3, 1/2" Dense AC.

4. COLLECTORS

- a. The minimum structural section for new or reconstructed Collectors and Neighborhood Collectors shall consist of 5-inches of AC Pavement over 12-inches of 1-inch crushed granular base rock over stable subgrade.
- b. The pavement section shall consist of one, 3-inch base lift of Level 3, 1/2" Dense AC, and a 2-inch surface lift of Level 3, 1/2" Dense AC.

5. ARTERIAL STREETS

- a. The minimum structural section for new or reconstructed minor and major arterial streets shall consist of 7-inches of AC Pavement over 15-inches of 1-inch crushed granular base rock over stable subgrade.
- b. The pavement section shall consist of two, 2 1/2-inch base lifts of Level 3, 1/2" Dense AC, and a 2-inch surface lift of Level 3, 1/2" Dense AC.

305.04.C STRUCTURAL STRENGTH COEFFICIENTS

- 1. When calculating the structural strength of each layer of the pavement structure, use the following values:
 - ❖ 0.42 per inch for hot mix AC
 - ❖ 0.06 per inch for clean, crushed aggregate base

- 2. The minimum structural section for a local street has a Structural Number (SN) of 2.4, determined as follows:

$$SN = (0.06)(12\text{-inches}) + (0.42)(4\text{-inches}) = 2.4$$

- 3. If the required SN is greater than 2.4, the Design Engineer shall increase the thickness of the AC in increments of 0.5-inch. Alternate structural materials and strength coefficients for use in the design shall be presented to the City Engineer for review.



305.04.D OVERLAYS

1. GENERAL

- a. Where an existing pavement base is determined to be structurally sound, an overlay of the pavement may be approved by the City Engineer to prevent further deterioration of the asphalt from oxidation or raveling. Pavement experiencing existing base failure through severe alligating or observable deflection under load shall be designed for pavement removal and replacement as required by the City Engineer.
- b. A structural overlay may be approved by the City Engineer to extend the useful life of the existing pavement structure by increasing the composite pavement Structural Number. The total structural number required for traffic loading during the design period shall be determined as described above.
- c. Overlays shall be performed using fabric to minimize reflective cracking to the overlay.
- d. Overlays shall not be feathered to match existing street pavement surfaces at paving limit lines. Taper grinding, butt grinding, or removal and reconstruction of the existing pavement will be required so the finished overlay surface will match the existing gutter or pavement grade.

2. EXISTING STRUCTURE

- a. The Structural Number of the existing pavement structure may be determined by non-destructive testing, sample pits, or both. All testing methods must be reviewed by the City Engineer prior to performing the tests.
- b. When taper or butt grinding are employed in the design, the Structural Number of the existing pavement at those locations shall be determined for the pavement thickness remaining after grinding.

3. OVERLAY THICKNESS – The required overlay thickness is determined by calculating the additional AC layer necessary to meet the value of the desired Structural Number. The minimum overlay thickness shall be 2-inches unless approved otherwise by the City Engineer.

4. PAVING FABRIC – An approved paving fabric shall be placed over the existing pavement immediately prior to the overlay, with the edge of the roll no more than 6-inches from the gutter or paving limit line. Required crack filling to support the fabric, and the fabric installation, shall be according to the manufacturer's recommendations. At no point will the pavement thickness over the fabric be less than 2-inches. The purpose of incorporating paving fabric is to create a waterproof membrane within the pavement structure to further protect the structure from water intrusion. While paving fabric may delay reflective cracking, it is not presumed to prevent it.

5. LIMITATIONS – The street must be evaluated for limiting factors that would make an overlay undesirable. Driveway approach grades shall be such that vehicles pulling trailers will be able to reasonably access the driveways without scraping or dragging. The maximum street cross slope after the overlay is placed must be determined and may not exceed 6 percent without approval of the City Engineer.



305.04.E ASPHALT COMPACTION

1. The AC pavement compaction shall be at least 91 percent based on a Rice theoretical maximum density, as determined in conformance with AASHTO T 209, as modified by ODOT. In addition, for Level 2 mix, a 50 blow Marshall (AASHTO T 245) and for Level 3 mix a 75 blow Marshall (AASHTO T 245) or Superpave Performance Testing as outlined in the ODOT Contractor Mix Design Guidelines for Asphalt Concrete shall be performed. All related test data shall be provided to the City Engineer. The minimum "Tensile Strength Ratio," "voids filled with asphalt," "voids in mineral aggregate," and "air voids" shall be according to the ODOT Oregon Standard Specifications for Construction.

305.05 PORTLAND CEMENT CONCRETE

305.05.A Design of the Portland Cement Concrete (PCC) pavement structural section shall follow the Portland Cement Association (PCA) or American Concrete Pavement Association (ACPA) design guides. The design will have a 90 percent statistical reliability of adequately supporting the design traffic loading without requiring any major maintenance or repair.

305.05.B The minimum slab thickness shall be 7-inches for local streets, 8-inches for alleys and collector streets, and 9-inches for arterial streets. A leveling course of no less than 4-inches of crushed granular base rock shall be placed under all concrete street sections.

305.05.C JOINTS

1. A typical joint pattern shall be specified and shown on the plans so that the joints are spaced to create panel length to width ratios that are 1.00 to 1.15.
2. The transverse joint pattern shall be slightly skewed in relation to the direction of traffic and be coordinated to match with all curb joints. The spacing of transverse joints will generally not be greater than 15-feet.
3. A longitudinal joint shall be sawcut along the street centerline. Supplemental longitudinal joints shall be specified if the resulting half-street panel width exceeds 18-feet.

305.06 SPECIALTY PAVEMENT TREATMENTS

305.06.A Specialty pavement treatments proposed to alter color, surface texture, or surface material shall be submitted by the Design Engineer and are subject to review and approval by the City Engineer. These materials and treatments may include colored concrete, stamped patterns, inlaid materials, interlocking pavers, or any other alternative treatments or materials.



306 STRIPING AND PAVEMENT MARKING PLANS

306.01 STRIPING PLAN

306.01.A A striping plan shall be provided for review and approval by the City Engineer prior to the application of any permanent pavement markings. All striping and pavement marking design shall comply with the standards contained in the current version of the Manual on Uniform Traffic Control Devices. Striping plans are not required for local residential streets unless required otherwise by the City Engineer.

306.02 STRIPING MATERIALS

306.02.A GENERAL

1. Permanent striping for new and re-constructed streets shall consist of paint, unless otherwise approved by City Engineer. Hot inlay tape consisting of rolls or pre-cut sheets placed on the fresh AC mat during the final compaction process may be used as approved by City Engineer. The City Engineer may approve the use of thermally fused markings for striping on existing asphalt or concrete street surfaces.

306.02.B APPLICATION

1. PAINT - Painted pavement markings shall consist of a minimum of two (2) coats of paint that conforms to the current ODOT Oregon Standard Specifications for Construction for White and Yellow Traffic Line Bead Binder Paint.
2. THERMALLY FUSED MARKINGS - Thermally fused marking material shall conform to the current ODOT Oregon Standard Specifications for Construction Section 00867.
3. RAISED PAVEMENT MARKERS
 - a. For collector and arterial streets, raised pavement markers shall be shown on the striping plans and shall be reflectorized and match the color of the strip they are complementing. Blue markers shall be placed near the center of the street at fire hydrant locations, offset 8-inches toward the hydrant. Markers shall comply with the ODOT Oregon Standard Specifications for Construction Section 00850
 - b. Pavement markers shall be ground in, unless otherwise approved.



307 TRAFFIC SIGNALS

307.01 GENERAL

307.01.A A licensed traffic engineer registered in the State of Oregon shall design and stamp plans for traffic signals. All documentation of traffic studies, field data, and recommendations shall be coordinated with the City Engineer. All plans and specifications shall be in accordance with Oregon Department of Transportation (ODOT) and MUTCD requirements or as modified by the traffic engineer. The final design of the traffic signal is to be approved and accepted by the City Engineer or City Traffic Engineer.



308 ILLUMINATION

308.01 GENERAL

- 308.01.A Streetlights shall be the responsibility of the Developer and shall be constructed as part of the required improvements at the Developer’s expense. Streetlights and any required pedestrian multi-use paths shall be provided with adequate lighting which conforms to public works standards. A complete street lighting system shall be shown on the plans, including a photometric layout, for review by the City Engineer.
- 308.01.B When decorative dark sky friendly lighting is proposed or required for a particular development, the lighting shall be designed and submitted to the City Engineer for review. Decorative lighting may be required in the downtown districts. Decorative lighting shall comply with Pacific Power and Light requirements.
- 308.01.C Streetlight poles shall be grey or brown fiberglass with dark sky friendly fixtures conforming to the Standard Drawings and Standard Construction Specifications. Infill development may utilize existing utility poles where approved by the City Engineer.
- 308.01.D For all projects that include the installation of luminaires, the Design Engineer must contact the electric utility early in the design process to coordinate providing service to the modified street network. The City and the electric utility shall approve luminaire and service point locations prior to approval of the improvement plans and issuance of a Construction Permit. Luminaires must be installed and operational prior to City acceptance of public improvements.
- 308.01.E Illumination systems shall conform to IESNA RP-8 (Illuminating Engineering Society of North America) American National Standard Practice for Roadway Lighting and shall conform to the minimum requirements shown below, accepted engineering practices, and electric utility guidelines.

308.02 AVERAGE MAINTAINED HORIZONTAL ILLUMINATION

308.02.A MINIMUM AVERAGE FOOT-CANDLE REQUIREMENTS

ROADWAY SEGMENTS		
Street Classification	Residential	Commercial or Industrial
Local	0.4 fc	0.9 fc
Collector	0.6 fc	1.2 fc
Arterial	0.9 fc	1.7 fc

Source: IES RP-8, American National Standard Practice for Roadway Lighting, Illuminating Engineering Society of North America.

Notes: Collector and arterial streets shall have a minimum weak point foot candle measurement of 0.2 fc.



ROADWAY INTERSECTIONS							
Street Classification		Residential			Commercial or Industrial		
		Local	Collector	Arterial	Local	Collector	Arterial
Residential	Collector	1.0 fc	1.2 fc				
	Arterial	1.3 fc	1.5 fc	1.8 fc			
Commercial or Industrial	Local	1.3 fc	1.5 fc	1.8 fc	1.8 fc		
	Collector	1.6 fc	1.8 fc	2.1 fc	2.1 fc	2.4 fc	
	Arterial	2.0 fc	2.2 fc	2.5 fc	2.5 fc	2.8 fc	3.2 fc

Source: IES RP-8, American National Standard Practice for Roadway Lighting, Illuminating Engineering Society of North America.

Notes: Collector and arterial streets shall have a minimum weak point foot candle measurement of 0.2 fc.

308.02.B MINIMUM AVERAGE UNIFORMITY RATIO

STREET CLASSIFICATION	MINIMUM AVERAGE UNIFORMITY RATIO
Local	6:1
Collector	4:1
Arterial	3:1

Source: IES RP-8, American National Standard Practice for Roadway Lighting, Illuminating Engineering Society of North America.

308.02.C LUMINAIRE TYPES

1. All luminaires shall be high efficiency LED conforming to the Design Standards and Construction Specifications and requirements established by Pacific Power and Lights, as applicable.

308.02.D AVERAGE MAINTAINED LUMENS

LUMINAIRE TYPE	INITIAL LUMEN VALUE	DEPRECIATION FACTOR	MAINTAINED LUMEN VALUE
70W HPS (M-S-II)	5,800	0.84	4,872
100W HPS (M-S-II)	9,500	0.84	7,980
200W HPS (M-C-III)	22,000	0.84	18,480
400W HPS (M-C-III)	50,000	0.84	42,000

Source: Pacific Power and Light Company.

Notes: Maintained Lumen Value = Initial Lumen Value x Depreciation Factor.



308.03 LOCATION

308.03.A Luminaire locations shall be subject to the approval of the City Engineer. Luminaries shall be located at property lines and curb returns where possible. A minimum of one (1) luminaire shall be located at each residential local street intersection, each 3-legged intersection (all classifications), and at the end of each cul-de-sac or permanent dead-end street. A minimum of two (2) or more luminaires shall be located at all other street intersections.

308.03.B Luminaire locations shall be as shown in the following table (those not specified shall be determined by the City Engineer):

MAXIMUM LUMINAIRE SPACING TABLE					
Street Width	Pole Configuration	Pole Height (above finish grade)	Mast Arm Length	Luminaire Type	Max. Spacing
Local Streets – Residential					
Varies	Staggered	25'	6' Property Line walks 8' Curblin e walks	70W HPS (M-S-II)	300'
Varies	Min one (1) per intersection	25'	6' Property Line walks 8' Curblin e walks	100W HPS (M-S-II)	Intersections
Local Streets – Commercial or Industrial					
40'	Staggered	25'	6' Property Line walks 8' Curblin e walks	200W HPS (M-C-III)	210'
Neighborhood Collector Streets – Residential					
34'-36'	Staggered	25'	6' Property Line walks 8' Curblin e walks	100W HPS (M-S-II)	150'
Neighborhood Collector Streets – Commercial or Industrial					
34'-36'	Staggered	25'	6' Property Line walks 8' Curblin e walks	200W HPS (M-C-III)	170'
Collector and Arterial Streets – Residential, Commercial, or Industrial					
36'-74'	Opposite Across	30'	8' Property Line walks 14' Curblin e walks	As approved	As approved

Source of Calculations: ALADAN II, A Lighting Application Design & Analysis Computer Program, Rev. 2.00, GE Company, 1992.

Notes: Street widths that vary from those listed above can either use maximum luminaire spacing of next higher width street or require separate calculation.



309 STREETSCAPE APPURTENANCES

309.01 GENERAL

309.01.A All public and private items that currently exist or will be placed in the right-of-way that will impact the sidewalk and/or the landscape strip shall be shown on the plans. Such items include but are not limited to fire hydrants, street lights, bus shelters, street signs, street trees, mail boxes, poles, vaults, and various utility appurtenances. Identify obstructions that would encroach into sidewalks and verify minimum clear space for passage exists or show how the impact will be mitigated.

309.01.B Permanent private signs will not be permitted in the public right-of-way. See Subsection 303.03 for private streets.

309.02 STREET SIGNS

309.02.A Street signs shall meet MUTCD, Standard Highway Sign and City requirements. See Standard Drawings. The type and location of the signs shall be shown or described on the plans.

309.02.B Street sign sizes and placement locations will be reviewed by the City Engineer. Street signs shall have high intensity reflective diamond grade or high prismatic surface. Standard STOP and warning sign sizes are 30-inch x 30-inch, but larger sizes may be required at specific locations. Other regulatory and informational signs shall follow standard size and content as described in the MUTCD or as directed by the City Engineer.

309.02.C Street name signs shall be as shown in the Standard Drawings.

309.03 BUS SHELTERS

309.03.A Bus shelters shall be installed as directed by the City Engineer. Coordinate with the City Engineer and City Planner to determine location and orientation of the shelters. Specifications for the concrete pad and bus shelter structure shall be as approved by the City Engineer.

309.03.B The shelters may be located in the landscape strip if adequate room exists or behind the sidewalk within the right-of-way or in an easement for that purpose. In no case shall the shelter be placed within the designated sidewalk area as an obstruction that would require a pedestrian to maneuver around the shelter.

309.04 MAILBOXES

309.04.A Final locations for mailboxes shall be coordinated with the U.S. Postal Service (USPS). The Design Engineer shall work with the USPS to ensure that mailboxes are installed according to the Standard Construction Specifications, meet ADA requirements, and will be acceptable to the United States Postal Service. Mailbox locations shall be identified on the plans.

309.05 STREET TREES

309.05.A The Design Engineer shall coordinate with the City Engineer and City Planner for appropriate tree species, location, and spacing. New trees shall not be planted in sight clearance areas or otherwise interfere with required sight distances, including but not limited to, intersections and railroad crossings. See also Section 303.06. Final plans and specifications for street trees and related vegetation or appurtenances will be reviewed by the City Engineer.



309.05.B Street trees in the public right-of-way, or within the setback and/or buffer area immediately adjacent to the right-of-way, will be required of all developments. The particular species will be reviewed and approved as part of overall project submittals. A deposit for street trees to assure installation of the trees prior to occupancy will be required at the time of building permit issuance.

309.05.C Minimum caliper of street trees shall be 1.5-inches, as measured 4 feet above ground level in accordance with the American Standard for Nursery Stock. Street trees shall be supplied with an approved root guard and shall be installed in accordance with the Standard Drawings. Newly planted trees shall be securely staked for the first 2-years after planting and shall be replaced if they die or are destroyed. Street trees must be healthy at the end of the warranty period.

309.05.D TREE SPACING

Tree Spacing	
Neighborhood Collectors and Local Streets	
Residential	30-feet (2 min per lot, 3 min if corner lot)
Commercial	20-feet (2 min per lot, 3 min if corner lot)
Industrial	20-feet
Arterials and Collectors	30-feet

Notes:

1. Spacing required may vary depending on sight distance and clearance area requirements and site and/or topography constraints. Distances include linear section of cul-de-sacs.
2. Street trees shall be located at least 15 feet from streetlights and stormwater catch basins, at least 10 feet from fire hydrants and utility poles, and at least 5 feet from driveway cuts and underground utilities, unless approved otherwise by the City Engineer.
3. Street trees shall not be located where the City determines the trees may be a hazard to the public interest or general welfare or under overhead power lines, if tree height at mature age exceeds the height of the power line.

309.05.E APPROVED STREET TREE LIST

Common Name	Latin Name	Planting Strip Width					
		Overhead Power			No Overhead Power		
		4'- 5.5'	6'- 7.5'	8' plus	4'- 5.5'	6'- 7.5'	8' plus
Hedge Maple	<i>Acer campestre</i>		X	X			
Rocky Mtn. Glow Maple	<i>Acer grandidentatum</i> 'Schmidt'		X	X			
Big Leaf Maple	<i>Acer macrophyllum</i>						X
State Street Maple	<i>Acer miyabei</i> 'Morton'					X	X
Columnar Norway Maple	<i>Acer platanoides</i> 'Columnar'				X	X	
Crimson King Maple	<i>Acer platanoides</i> 'Crimson King'						X
Crimson Sentry Maple	<i>Acer platanoides</i> 'Crimson Sentry'	X	X				
Deborah Maple	<i>Acer platanoides</i> 'Deborah'						X
Emerald Queen Maple	<i>Acer platanoides</i> 'Emerald Queen'						X
Emerald Lustre Maple	<i>Acer platanoides</i> 'Pond'						X
Sycamore Maple	<i>Acer pseudoplatuanus</i>					X	X



APPROVED STREET TREE LIST (continued)

Common Name	Latin Name	Planting Strip Width					
		Overhead Power			No Overhead Power		
		4' - 5.5'	6' - 7.5'	8' plus	4' - 5.5'	6' - 7.5'	8' plus
Bowhall Maple	<i>Acer rumbrum</i> 'Bowhall'				X	X	
Red Sunset Maple	<i>Acer rumbrum</i> 'Franksred'						X
October Glory Maple	<i>Acer rumbrum</i> 'October Glory'						X
Scanlon Maple	<i>Acer rumbrum</i> 'Scanlon'				X	X	
Scarlet Sentinel Maple	<i>Acer rumbrum</i> 'Scarsen'				X	X	
Jacquemontii Birch	<i>Betula jacquemontii</i>					X	X
Pyramidal European Hornbeam	<i>Carpinus betulus</i> 'Fastigiata'					X	X
Golden Catalpa	<i>Catalpa bignonioides</i> 'Aurea'						X
Katsura Tree	<i>Cercidiphyllum japonicum</i>						X
Eastern Redbud	<i>Cercis canadensis</i>		X	X			
Pacific Dogwood	<i>Cornus nuttallii</i>			X			
Lavalle Hawthorn	<i>Crataegus x lavellei</i>	X	X				
European Beech	<i>Fagus sylvatica</i>					X	X
Dawyck Purple Beech	<i>Fagus sylvatica</i> 'Dawyck Purple'				X	X	
Autumn Purple Ash	<i>Fraxinus americana</i> 'Junginger'					X	X
Golden Desert Ash	<i>Fraxinus excelsior</i> 'Aureaefolia'	X	X				
Flame Ash	<i>Fraxinus oxycarpa</i> 'Flame'				X	X	
Raywood Ash	<i>Fraxinus oxycarpa</i> 'Raywood'				X	X	
Marshall Ash	<i>Fraxinus pannsylvanica</i> 'Marshall'					X	X
Summit Ash	<i>Fraxinus pannsylvanica</i> 'Summit'				X	X	
Sunburst Honeylocust	<i>Gleditsia triacanthos</i> var. <i>inermis</i> 'Suncole'						X
Arnold Tulip Tree	<i>Liriodendron tulipifera</i> 'Fastigiatum'				X	X	
Kobus Magnolia	<i>Magnolia kobus</i>					X	X
Bloodgood London Planetree	<i>Platanus x acerfolia</i> 'Bloodgood'						X
Thundercloud Plum	<i>Prunus cerasifera</i> 'Thundercloud'		X	X			
Kwanzan Cherry	<i>Prunus serrulata</i> 'Kwanzan'		X	X			
Chanticleer Pear	<i>Pyrus calleryana</i> 'Glen's Form'				X	X	
Swamp White Oak	<i>Quercus bicolor</i>						X
Scarlet Oak	<i>Quercus coccinea</i>						X
Oregon White Oak	<i>Quercus garryana</i>						X
Pin Oak	<i>Quercus palustris</i>						X
Skyrocket Oak	<i>Quercus robur</i> 'Fastigiata'				X	X	
Red Oak	<i>Quercus rubra</i>					X	X

APPROVED STREET TREE LIST (continued)



Common Name	Latin Name	Planting Strip Width					
		Overhead Power			No Overhead Power		
		4' - 5.5'	6' - 7.5'	8' plus	4' - 5.5'	6' - 7.5'	8' plus
Shumard Oak	<i>Quercus shumardii</i>						X
Globe Locust	<i>Robinia pseudoacacia</i> 'Inermis'		X	X			
Red Cascade Mountain Ash	<i>Sorbus americana</i> 'Dwarfscrown'	X	X				
Cardinal Royal Mountain Ash	<i>Sorbus aucuparia</i> 'Michred'				X	X	
Greenspire Linden	<i>Tilia cordata</i> 'Greenspire'					X	X
Salem Linden	<i>Tilia cordata</i> 'Salem'					X	
Allee Elm	<i>Ulmus parvifolia</i> 'Emer II'					X	X
Halka Zelkova	<i>Zelkova serrata</i> 'Halka'					X	X
Green Vase Zelkova	<i>Zelkova serrata</i> 'Green Vase'					X	X

Source: City of Salem.



310 RECREATIONAL TRAILS AND MULTI-USE PATHS

310.01 RECREATIONAL TRAILS

310.01.A GENERAL

1. Recreational trails shall be provided by Developers in locations designated by the City's adopted parks plan, trails program, and as required by land use decisions.
2. A recreational trail is a facility separated from motor vehicle traffic by an open space or barrier, either within the street right-of-way or within an independent right-of-way or easement. These are typically used by joggers and hikers as two-way facilities. Recreational trails are appropriate in corridors not well served by multi-use paths to create short cuts that link destination and origin points as elements of the City's trail plan.
3. Recreational trails shall not provide access or support any vehicle traffic. Recreational trails shall be assumed as for pedestrian use only with a minimum vertical clearance of 7-feet to overhead obstructions. Proposed modifications due to physical constraints or other circumstances must be approved by the City Engineer.
4. Recreational trails shall be a minimum of 8-feet wide with 2-foot wide shoulders.
5. Recreational trail right-of-way or easement width shall be a minimum of 20-feet or as required by the City Engineer. In order to protect natural riparian vegetation or other sensitive areas, recreational trails shall be located a minimum of 20-feet, or as required by the City Engineer, from the top of bank of rivers, streams, or other sensitive areas. Where required, the design of the recreational trails shall be interrupted by periodic points of access to permit viewing the waterway from the bank.
6. Rights-of-way for recreational trails shall be dedicated to the City for public use or may be approved as public access easements on private property. Recreational trails shall be maintained as part of the public right-of-way or by the underlying landowner if constructed as public easements over private land.

310.01.B GRADE

1. Where the recreational trail grade would exceed 18 percent slope, a recreational trail will be constructed as stairs for pedestrians. Based on local conditions, the City Engineer may approve alternatives to stairs, including the use of switchbacks and alternative materials. If stairways are needed, they shall be at least 5-feet wide with handrails on both sides.

310.01.C LIGHTING

1. Complete illumination of the trail is not required; however, adequate lighting shall be provided to fully illuminate the entrances to the recreational trail unless otherwise required by the City Engineer.



310.01.D STRUCTURAL SECTION

1. Recreational trails shall be constructed with asphalt concrete pavement unless specifically defined below or otherwise approved by the City Engineer. Asphalt pavement or approved equivalent shall be required in locations where the supporting soils are wet and boggy such as near a river, stream, or wetland. The minimum structural pavement section shall be minimum 2-inches of class "C" asphalt concrete pavement over 3-inches of 3/4" or 1" crushed aggregate base.
 - a. Where recreational trails are required to blend with the sidewalk system in public right-of-way, the trail shall be constructed with Portland Cement Concrete to sidewalk standards.
 - b. Where the recreational trail is located within a natural rural setting as determined by the City Engineer, a softer surface such as shredded bark may be allowed.
2. Recreational trails shoulders shall be 1-foot wide and be constructed of native backfill material unless otherwise required by the City Engineer.

310.02 MULTI-USE PATHS

310.02.A GENERAL

1. Multi-use paths shall be provided by Developers in locations designated by the City's adopted parks plan, trails program, and as required by land use decisions.
2. A multi-use path (also known as "Bike Path" or "Accessway") is a facility separated from motor vehicle traffic by an open space or barrier, either within the street right-of-way or within an independent right-of-way or easement. These are typically used by pedestrians, joggers, skaters and bicyclists as two-way facilities. Multi-use paths are appropriate in corridors not well served by streets to create short cuts that link destination and origin points.
3. The design of a multi-use path is to reference the AASHTO Guide for the Development of Bicycle Facilities and the U.S. Access Board Public Rights-of-Way Accessibility Guidelines.
4. Multi-use paths shall be assumed as shared use with a minimum vertical clearance of 10-feet to overhead obstructions. Proposed modifications due to physical constraints or other circumstances must be approved by the City Engineer.
5. Multi-use paths for pedestrian and bicyclists shall be 8-feet wide with 2-feet wide shoulders. Multi-use paths that will also provide secondary fire and/or utility maintenance vehicle access shall be a minimum of 12-feet wide with 2-feet wide shoulders.
6. Multi-use path right-of-way or easement width shall be a minimum of 20-feet or as required by the City Engineer. In order to protect natural riparian vegetation or other sensitive areas, multi-use paths shall be located a minimum of 20-feet, or as required by the City Engineer, from the top of bank of rivers, streams, or other sensitive areas. Where required, the design of the multi-use paths shall be interrupted by periodic points of access to permit viewing the waterway from the bank.
7. Rights-of-way for multi-use paths shall be dedicated to the City for public use or may be approved as public access easements on private property. Multi-use paths shall be maintained as part of the public right-of-way or by the underlying landowner if constructed as public easements over private land.



8. Multi-use paths shall be constructed for two different situations where 1) no vehicular use will occur and 2) where heavy maintenance or emergency vehicle access use will occur. In both cases, subgrade preparation will require removal of existing organic material in accordance with roadway construction. Multi-use paths shall prohibit the use of unauthorized motor vehicle traffic by installing removable bollards as shown in the Standard Drawings.
9. Multi-use paths connected to public streets shall be straight enough at both ends to be visible from the public street. On-street parking shall be prohibited within 15-feet of the intersection of a multi-use path and a public street to preserve safe sight distance. A clear-vision triangle shall be provided at the ends of the multi-use path.

310.02.B GRADE

1. Where the multi-use path grade would exceed 15 percent slope, a multi-use path shall be constructed as stairs for pedestrians. Based on local conditions, the City Engineer may approve other alternatives, including the use of switchbacks and alternative materials. If stairways are needed, they shall be at least 5-feet wide with handrails on both sides and approved by the City Engineer. Adequate signing and pavement markings shall be provided in locations not allowing safe maneuvering of fire and/or utility maintenance vehicles. Parking and adequate hammerhead turn-around shall also be provided.

310.02.C LIGHTING

1. Adequate lighting shall be provided to fully illuminate the entire length of a pedestrian or multi-use path unless otherwise approved by the City Engineer.

310.02.D STRUCTURAL SECTION

1. Multi-use paths shall be constructed with PCC pavement. The minimum structural PCC pavement section shall be 4-inches of PCC pavement over 4-inches of 3/4" or 1" crushed aggregate base. If the path is intended to support utility maintenance trucks, the PCC thickness shall be increased to 8-inches minimum or as necessary to adequately support the anticipated vehicle traffic loads.
2. Multi-use path shoulders shall be 2-feet wide or a minimum of 1-foot wide when adjacent to drainage ditches and constructed of 3/4" or 1" crushed aggregate unless otherwise approved by the City Engineer.

310.03 DRAINAGE

310.03.A Where a path or trail is constructed on a hillside or along an unimproved hillside roadway, a ditch of suitable dimensions shall be placed on the uphill side to intercept the hillside runoff. The ditch centerline shall be at least 5-feet from the edge of the pavement and additional right-of-way or easement width may be required. Ditch side slope adjacent to the edge of the pavement shall be no steeper than 2:1 when measuring the horizontal distance to the vertical distance. There shall be a minimum 1-foot shoulder between the edge of the pavement and the top of ditch.

310.03.B Where possible, ditch inlets and catch basins shall be installed to intercept the runoff water and carry it under the path or trail. Drainage grates and manholes shall be located outside the traveled way of the pedestrian and bicyclists with the slits of the drainage grates placed perpendicular to the path or trail.



310.03.C When a culvert is used to cross a path or trail, the ends of the pipe shall be no closer than 5-feet from the edge of the pavement.

310.03.D Where possible, natural ground cover should be included in the design to prevent erosion on cut and fill slopes.

310.04 FENCING AND SCREENING

310.04.A When required by the City Engineer for buffering, paths or trails shall be fenced and screened along adjacent right-of-way or easement lines. The fencing centerline shall be at least 7-feet from the edge of the pavement unless otherwise approved by the City Engineer. Additional right-of-way or easement width may be required. The area between the path or trail and fences shall be planted with a combination of groundcover or low-growing shrubs that will reach no more than 2-feet high at maturity.



311 BRIDGES AND SPECIAL STRUCTURES

311.01 GENERAL

- 311.01.A** Structures not included in the Standard Drawings shall be designed by a licensed professional engineer, registered in the State of Oregon, in accordance with the requirements of the Structural Design Section of ODOT and MUTCD. These Standards are referenced in ODOT's Bridge Design Manual and accompanying Standard Details, ODOT Standard Specifications for Highway Construction, and ODOT Standard Drawings for Design and Construction. The final structural design shall be reviewed by the City Engineer and approved by all jurisdictional agencies.
- 311.01.B** All documentation of hydrological and soil studies, field data, and recommendations shall be coordinated with the City Engineer.

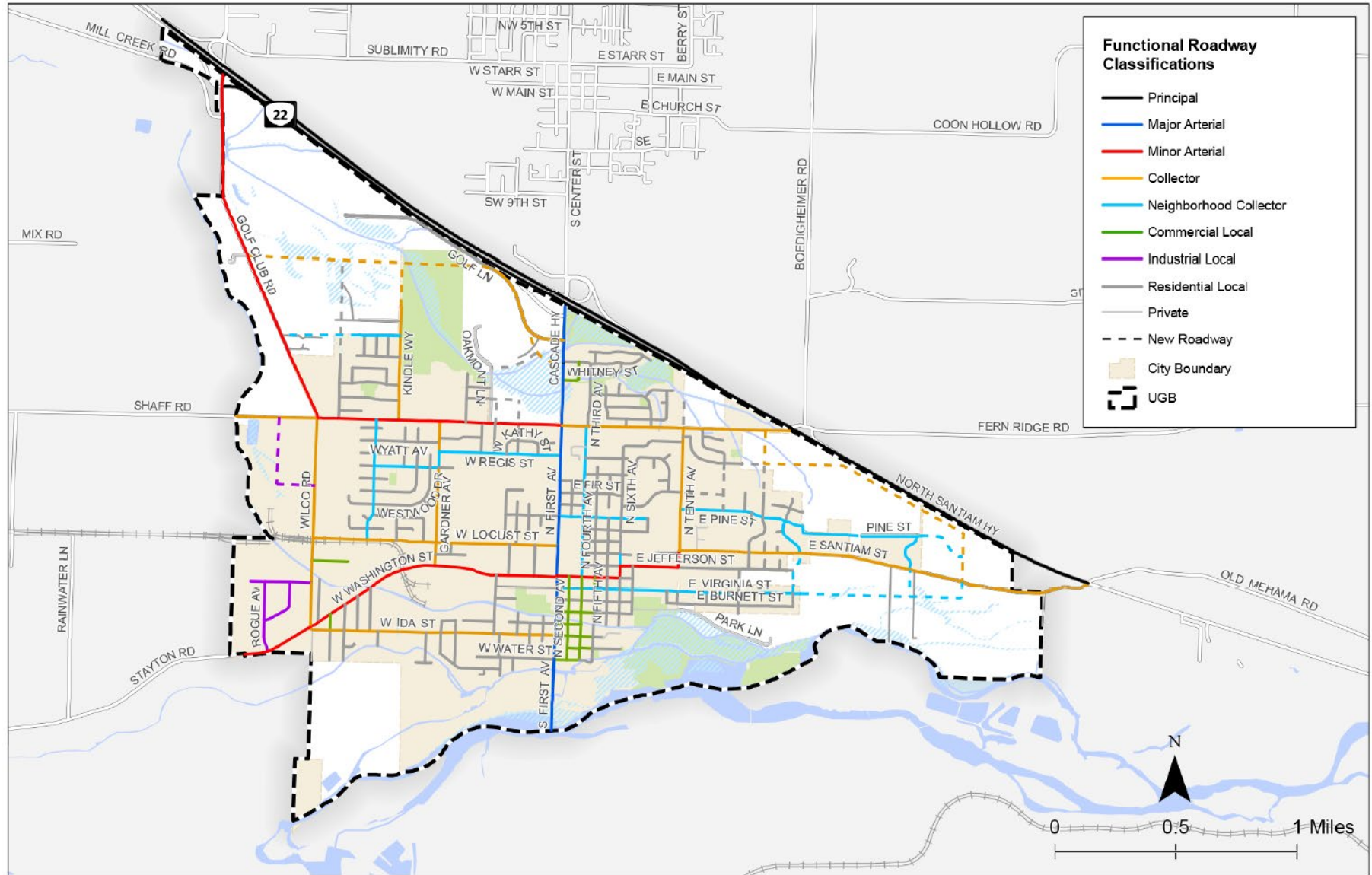


312 DESIGN ATTACHMENTS

END OF DIVISION



STREET FUNCTIONAL CLASSIFICATION MAP





GEOMETRIC DESIGN REQUIREMENTS BY STREET FUNCTIONAL CLASSIFICATION*

Right-of-way Width (ft)	Improvement Width (ft) (curb - curb)	Number & Size Lanes (No. / Width)	Bicycle Lanes (No. / Width)	On-street Parking (No. / Width)	Sidewalk Alignment	Sidewalk Width (ft)	Landscape Area Width (ft)	Street where the Standard is to Apply		At Major Intersections		Roadway Jurisdiction
								Specific Street	Where Standard will Apply	Lanes **	Intersection Locations	
Major Arterial												
Variable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Highway 22	Along northern Stayton UGB	N/A	Varies	ODOT
100'	48'	2/12' + 12'	2/6'	No	Property Line	6'	6'	Cascade Highway	Highway 22 to Regis Street	3 Lanes	Shaff	Marion Co.
60' to 80'	46'	2/11' + 12'	2/6'	No	Curb line	8'	0'	1st Avenue ¹	Regis Street to Washington Street	3 lanes	Varies	Marion Co.
60' or 80'	46'	2/11' + 12'	2/6'	No	Curb line	8'	6'	1st Avenue ²	Washington St. to Water St.	4 lanes	Ida	Marion Co.
80'	46' to 34'	2/11' + 12'	2/6'	No	Property line	8'	6'	1st Avenue ³	S. of Water St. (taper out turn lane by bridge)	3 lanes	Water	Marion Co.
Minor Arterial												
100'	46'	2/11' + 12'	2/6'	No	Property line	6'	6'	Golf Club Road ⁴	Highway 22 to Shaff Road	3 lanes	Shaff	Marion Co.
80'	50'	2/12' + 14'	2/6'	No	Property line	8'	6'	Shaff Road ⁵	Wilco Road to 1st Avenue	3 lanes	1st Avenue & Wilco	Marion Co.

** Lanes 100' + taper (add right-of-way each side)

¹ 1st Avenue:

- a. (Regis Street to Washington Street): The Stayton TSP calls for an 80' R/W & 3-lane section from Regis Street to the North Santiam River. R/W widths vary. Existing pavement width is 40+/- with 2 travel lanes and a center turn lane, but no bike lanes. Measure R/W from center section line of Section 10. In lieu of full R/W, City can accept 60' R/W + a 10' wide PUE/SW easement where approved.
- b. (Regis Street to Cedar): Existing R/W is 50'. Minimum R/W dedication to 60' is required – 30' from centerline + a 10' wide PUE/SW easement.
- c. (Cedar Street to Hollister Street): Existing R/W varies from 55' to 60'. Minimum R/W dedication to 60' is required – 30' from centerline + a 10' wide PUE/SW easement.
- d. (Hollister Street to Washington Street): Existing R/W varies from 45' to 60'. Minimum R/W dedication to 60' is required – 30' from centerline + a 10' wide PUE/SW easement.
- e. (1st Avenue / Washington Street Intersection): Additional R/W is anticipated at the 1st Avenue & Washington Street intersection.

² 1st Avenue:

- a. (Washington Street to Ida Street): The Stayton TSP calls for an 80' R/W & 3-lane section from Regis Street to the North Santiam River. R/W widths vary. Existing pavement width is 40+/- with two travel lanes and a center turn lane, but no bike lanes. Measure R/W from center section line of Section 10. In lieu of full R/W, City can accept 60' R/W + a 10' wide PUE/SW easement where approved.
- b. (Washington Street to Ida Street): Existing R/W varies from 40' to 55'. Minimum R/W dedication to 60' is required – 30' from centerline. See Barker research on 1st Avenue R/W lines for this section of roadway and City GIS concept plan.
- c. (Ida Street to Water Street): Existing R/W varies from 56' to 59'. Minimum R/W dedication to 60' is required – 30' from center section line of Section 10.

³ 1st Avenue (Water Street to North Santiam River): The Stayton TSP calls for an 80' R/W & 3-lane section from Regis Street to the North Santiam River. Existing R/W varies from 65' to 80'. Existing pavement width is 40+/- with two travel lanes, plus a taper to a 3 lane section at Water Street. Minimum R/W dedication to 80' is required south of Water Street – 40' from centerline.

⁴ Golf Club Road: The Stayton TSP calls for a 100' R/W & 5-lane section. The City of Stayton and Marion County have not yet completed a conceptual design plan for Golf Club Road (Hwy 22 to Shaff/Wilco Road Intersection). Until a conceptual design plan is approved by the City and Marion County for Golf Club Road, the City will review each development fronting Golf Club Road on a case-by-case basis to determine R/W dedications, pavement widths, # of lanes, and frontage improvement (curb, sidewalk, storm) requirements. Until a Golf Club Road Conceptual Plan is approved, the City will require any new developments, and/or substantial changes to existing development, to comply with the typical section shown in the Wilco Road Conceptual Design. See Footnote 9 below.

⁵ Shaff Road: Existing R/W varies. R/W dedications to 80' are required -- 40' from centerline unless otherwise required. See also Footnote 9 below for Golf Club/Shaff/Wilco Road intersection.



Right-of-way Width (ft)	Improvement Width (ft) (curb - curb)	Number & Size Lanes (No. / Width)	Bicycle Lanes (No. / Width)	On-street Parking (No. / Width)	Sidewalk Alignment	Sidewalk Width (ft)	Landscape Area Width (ft)	Street where the Standard is to Apply		At Major Intersections		Roadway Jurisdiction
								Specific Street	Where Standard will Apply	Lanes **	Intersection Locations	
60' up to 70'	34'	2/11'	2/6'	No	Property line	6' - 8' varies	5' - 8' varies	W. Washington Street ⁶	Wilco Road to 1 st Ave. (City R/W per TSP)	3 lanes	1 st , Gardner & Wilco	City
60'	46' (1 st - to 3 rd)	2/11' + 12'	2/6'	No	Curb line	6' - north 8' - south	0'	E. Washington Street ⁷	1 st Avenue to 3 rd Avenue	3 lanes	1 st Avenue	Marion Co.
60'	34' (3 rd to 10 th)	2/11'	2/6'	No	Property line	6'	6'	E. Washington St. / 6th / Jefferson St. / 10th ⁸	3 rd Avenue to E. Santiam Street	3 lanes	Varies	Marion Co.
Collector												
80'	46'	2/11' + 12'	2/6'	No	Property line	6'	8'	Designated yellow in TSP	(Designated yellow in TSP or by PW Director)	Variable	Varies	City
80'	50'	2/12' + 14'	2/6'	No	Property line	6'	8'	Wilco Road ⁹	Shaff Road (Signalized) to Ida Street (All Way Stop)	5 lanes	Shaff	Marion Co.
80'	46'	2/11' + 12'	2/6'	No	Property line	6'	8'	Washington – W. Stayton Road / Shaff Road ¹⁰	West of Wilco Road Taper to 2 lanes @ UGB	3 lanes	Wilco	Marion Co.
80'	46'	2/11' + 12'	2/6'	No	Property line	6'	8'	Fern Ridge Road ¹¹	1 st Avenue to Hwy 22	5 lanes	1 st Avenue	Marion Co.
60'	34'	2/11'	2/6'	No	Property line	6'	5'	Locust Street ¹²	Wilco Road to 1 st Avenue	3 lanes	1 st Avenue	City
60'	34'	2/11'	2/6'	No	Property line	6'	5'	Gardner Avenue ¹³	Shaff Road to Washington Street	3 lanes	Shaff & Washington	City

⁶ W. Washington Street:

- a. (1st Avenue to Wilco Road): This section is improved curb-to-curb. R/W and pavement widths vary. Use existing curbs to plan for SW & bike lanes.
- b. (1st Avenue to Evergreen): Existing R/W varies from 45' to 55'. R/W dedications to 60' are required -- 30' from centerline. 8' sidewalk on north side from 1st to Gardner Avenue.
- c. (Evergreen to Wilco Road): Existing R/W is 60' width. No R/W dedication is anticipated, unless needed to allow for sidewalk widening and bike lane improvements.
- d. (Intersections @ 1st, Gardner & Wilco): R/W dedications will be required near 1st Avenue and Wilco Road intersections.

⁷ E. Washington Street:

- a. (1st Avenue to 3rd Avenue): This two block section from 1st Avenue to 3rd Avenue is part of the Downtown core area.
- b. (1st Avenue intersection): Existing R/W is 60'+. Pavement width is 50' @ intersection. R/W dedication is anticipated for turn lanes.
- c. (E. Washington Street: 1st to 3rd Avenue): Existing R/W is 60'. Pavement width narrows from 50' @ 1st Avenue to 44' at 3rd Ave. R/W dedication is anticipated at corners.

⁸ E. Washington Street:

- a. (3rd Avenue to 10th Avenue): This corridor from 1st Avenue to 10th Avenue is improved from curb-to-curb. Pavement width is typically 40', with a few exceptions.
- b. (E. Washington: 3rd to 6th Avenue): Existing R/W is 60'. Pavement width varies from 44' @ 3rd to 40' @ 6th. R/W dedication is anticipated at corners
- c. (6th Avenue / Washington to Jefferson Street): Existing R/W is 60'. Pavement width is 40'. R/W dedication is anticipated at corners.
- d. (Jefferson Street: 6th to 10th Avenue): Existing R/W is 60'. Pavement width is 40'. R/W dedication is anticipated at corners.
- e. (10th Avenue / Jefferson to E. Santiam Street): Existing R/W is 60'. Pavement width is 50'+/-. NO R/W dedication is anticipated.

⁹ Wilco Road Conceptual Design: In 2014, the City of Stayton and Marion County agreed on a conceptual design plan for Wilco Road (Shaff Road to Ida / Washington Street). The conceptual plan includes recommended R/W widths, pavement cross-sections, sidewalk widths and locations, and various water quality swale locations. New developments and substantial changes to existing development are to comply with the conceptual design plan unless otherwise approved by the City and Marion County.

¹⁰ W. Washington Street & W. Stayton Road / Shaff Road: See Footnote 9 above.

¹¹ Fern Ridge Road: Existing R/W varies from 60' to 80'. Minimum R/W dedication to 80' is required – 40' from centerline. Match north R/W & curb lines near 10th Avenue at end of Sylvan Springs subdivision.

¹² Locust Street: Existing R/W varies from 50' to 60'. Minimum R/W dedication to 60' is required – 30' from centerline. Match north R/W line. Only R/W dedication required between 1st Avenue & Birch on south side.

¹³ Gardner Avenue: Existing R/W is 60'. Only R/W dedication required is radius at Shaff Road / Gardner Avenue intersection.



Right-of-way Width (ft)	Improvement Width (ft) (curb - curb)	Number & Size Lanes (No. / Width)	Bicycle Lanes (No. / Width)	On-street Parking (No. / Width)	Sidewalk Alignment	Sidewalk Width (ft)	Landscape Area Width (ft)	Street where the Standard is to Apply		At Major Intersections		Roadway Jurisdiction
								Specific Street	Where Standard will Apply	Lanes **	Intersection Locations	
60'	36'	2/11'	Shared	2/7'	Property line	6'	5'	Ida Street ¹⁴	Wilco Road to 1 st Avenue	3 lanes	1 st Avenue	City
60'	34'	2/11'	2/6'	No	Property line	6'	5'	10 th Avenue ¹⁵	Fern Ridge Road to E. Santiam Street (3 lanes @ Hospital)	3 lanes	Ends & Hospital	City
Neighborhood Collector												
60'	34'	2/10'	No	2/7'	Property line	5'	4.5' & 5.5'	Designated green in TSP	Designated by green line on TSP map	2 lanes	Varies	City
Local Streets												
60'	34'	2/10'	No	2/7'	Property line	5'	6.5'	Standard residential street	Residential streets throughout the city	2 lanes	Varies	City
60'	34'	2/10'	No	2/7'	Property line	5'	6.5'	Long Cul-de-sacs	200' to 450' to end of bulb	2 lanes	Varies	City
50'	30'	2/11'	No	1/8'	Property line	5'	4.5'	Short Cul-de-sacs	Less than 200' to end of bulb	2 lanes	Varies	City
45'	28'	2/10'	No	1/8'	Property line	5'	3.5'	Skinny Street (as approved)	Hillsides (or with PW Approval)	2 lanes	Varies	City
48' radius	41.5' radius		No	No	Property line	6'	0'	Turnaround bulb	at end of cul-de-sacs	N/A		City
Downtown Commercial Streets												
60'	40'	2/13'	No	2/7'	Property line	9.5'	0'	Downtown Area	1 st Avenue to 4 th Avenue Washington Street to Water Street	2 lanes	Varies	City
60'	36'	2/11'	No	2/7'	Property line	12'	0'	3 rd Avenue	Redevelopment: Water Street to Burnett Street per Downtown Plan	2 lanes	Varies	City
Industrial Streets												
80' (Industrial)	40'	2/13'	No	2/7'	Property line	5'	14'	Industrial low use parking	Sidewalks per Public Works	2 lanes	Varies	City
60' radius (Industrial)	TBD (45' min)	TBD	No	2/7'	Property line	5'	14'	Industrial turnaround bulb	At end of cul-de-sacs	N/A	Varies	City
Roundabouts¹⁶												
200' dia.	170' dia.	1 circular	No	No	Property line	6'	8'	Wilco Rd. / Ida St. / Washington St.	5-way intersection	N/A	Varies	Marion Co.
130' dia.	110' dia.	1 circular	No	No	Property line	6'	8'	Washington St. / 6 th / Jefferson St. / 10 th	Total of 4 between 1 st Avenue to & E. Santiam Street	N/A	Varies	Marion Co.
Alleys												
16'	15'	N/A	N/A	No	N/A	N/A	N/A	Alleys (as approved by Public Works)	As approved by Public Works	N/A	Varies	City

*Streets and Alley requirements shown above are for general guidance. Specific requirement for each development shall be confirmed and coordinated with the City Engineer.

¹⁴ Ida Street: Existing R/W is 60', except at NW corner of Evergreen. Minimum R/W dedication to 60' is required – 30' from centerline. R/W dedication required at corner of Evergreen.

¹⁵ 10th Avenue: Existing R/W varies 60' to 70'. R/W dedication, sidewalk and or slope easement is required for east side sidewalks north of E. Fir Street.

¹⁶ Roundabouts: Marion County has not adopted the TSP recommendation for roundabouts at various intersections. No roundabout is required unless approved by the City of Stayton and Marion County. At the time the City reviews any new development or substantial change to a development near each of these intersections, the City and Marion County will review and agree on the intersection design.

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DIVISION 4

WATER DISTRIBUTION

401 GENERAL

401.01 AUTHORITY AND PURPOSE

- 401.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City. Most of the elements contained in these Design Standards are public works oriented and it is intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements.
- 401.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects that ultimately will be owned, operated, or maintained by the City shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 401.01.C** The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of public improvements shall be implemented. All public system improvements and public works facilities shall be designed and constructed in accordance with applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals, and in accordance with applicable federal, state, and local statutes and rules. Approval of public improvements must be made by the City Engineer or the Public Works Director before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- 401.01.D** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every public improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 401.01.E** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.
- 401.01.F** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such variance will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.



- 401.01.G** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. Request must show that the variance meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All requests will be in writing and be accompanied by engineered drawings and final design calculations.
- 401.01.H** All franchise utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City Standards.
- 401.01.I** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.
- 401.01.J** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 401.01.K** On completion of projects to become public works, the Design Engineer shall submit one complete set of reproducible "Record Drawings" (As-Builts), a compact disc (CD) containing electronic PDFs and cad files (AutoCAD or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification.
- 401.01.L** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 401.01.M** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.
- 401.01.N** The objective of these Design Standards is to develop a water distribution system that will:
- ❖ Be consistent with the adopted Water Master Plan.
 - ❖ Be of materials strong enough to resist all expected loads, both internal and external, and able to preserve the potability of the water supply.
 - ❖ Provide a water distribution system that is consistent and predictable.
 - ❖ Be economical and safe to build and maintain.

401.02 APPLICABILITY

- 401.02.A** These Design Standards shall govern the design for the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Design Standards.

401.03 REFERENCES

- 401.03.A** These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Subsection 101.03 and others specifically listed below. Projects are expected to be consistent with the following:



1. Applicable design criteria and concepts consistent with the most recent Water Master Plan adopted by the City of Stayton unless more restrictive criteria are identified herein. Where additional detailed information and background is required for a particular project, the Water Master Plan shall be referred and adhered to, as applicable. Any deviations from the Water Master Plan shall be flagged and presented to the City Engineer for consideration.
2. Applicable design criteria and concepts in accordance with the rules and regulations of the Oregon Health Authority – Drinking Water Services (OHA-DWS) as established in the Oregon Administrative Rules, Chapter 333, Division 61.
3. State of Oregon Plumbing Specialty Code.
4. Applicable design guidelines published by the American Water Works Association.
5. Applicable design guidelines published by the American Society of Civil Engineers.

401.04 SPECIAL DESIGN APPLICATIONS

401.04.A Special design applications not covered in these Design Standards require review and approval by the City. Additional review and approval by the Oregon Health Authority – Drinking Water Services (OHA-DWS) may also be required. Submittal of full design calculations, supplemental drawings, and information will be required prior to any approval.

401.04.B Such design applications requiring special review and approval include, but are not limited to, the following:

- ❖ Water Distribution Pump Stations
- ❖ Reservoirs
- ❖ Relining of Existing Water Mains
- ❖ Treatment Plants
- ❖ Pressure Regulating Devices
- ❖ Flow Measurement/Monitoring/Controls/Telemetry Devices

401.05 STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS

401.05.A Except as otherwise provided by these Design Standards, all construction design detail, workmanship, and materials shall be in accordance with the current edition of the City of Stayton Public Works Standard Construction Specifications and Standard Drawings.

401.06 CITY POLICY REGARDING ENGINEERING

401.06.A It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.

401.06.B Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction, and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.



401.06.C City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required; the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.

401.07 CONVENTIONS USED THROUGHOUT THE DESIGN STANDARDS

401.07.A See Subsection 101.07 for conventions used throughout these Design Standards.

401.08 ORGANIZATION AND CLASSIFICATION OF DIVISIONS

401.08.A See Subsection 101.08 for the organization and classification of divisions throughout these Design Standards.

401.09 CLARIFICATIONS, MODIFICATIONS, AND REVISIONS TO DESIGN STANDARDS

401.09.A These Design Standards will be periodically updated due to changes in policy or procedures, new technology, and methods of design and construction. Periodic revisions to these Design Standards will be necessary to maintain consistency in that regard. The date appearing on the title page is the date of the latest revision for each Division. Parenthetical notations at the bottom of each page indicate the most recent change. It will be the user's responsibility to obtain and maintain his/her copy of these Design Standards with the latest changes.

401.09.B See Subsection 101.09 for general policies and procedures regarding clarifications, modifications, and revisions to the Design Standards.

401.10 DEFINITIONS AND TERMS

401.10.A See Subsection 101.10 for standard definitions and terms used throughout these Design Standards.



402 GENERAL DESIGN REQUIREMENTS

402.01 PERFORMANCE STANDARDS

- 402.01.A** Water distribution systems shall be designed to meet Oregon Administrative Rules (including ORS448), AWWA Standards, and guidelines of the current Water Master Plan and its updates.
- 402.01.B** The water system shall have sufficient capacity to maintain 40 psi at the building side of the meter for one and two family dwellings. For other developments a minimum pressure of 35 psi will be provided at the building side of the meter during periods of maximum day demand. The system shall have adequate flow during expected maximum daily demand plus fire flows while maintaining a minimum 20 psi operating pressure. Normal working pressure in the distribution system should be approximately 60 psi with a range of 40 psi to 80 psi. Any isolated locations with pressure above 80 psi require a Pressure Reducing Valve (PRV) on the customer side of the meter. NOTE: A pump shall not be used on a service line to provide adequate pressure to a subdivision lot or property located above the pressure level of the supply main.
- 402.01.C** Water system design shall meet distribution needs for projected maximum daily demand within a given service area. New water systems shall allow for future extensions beyond present development that are consistent with the Water Master Plan. New water systems shall be sized according to the current zoning area fire flow needs, velocity, standards, and water modeling determinations.
- 402.01.D** Water distribution systems shall be designed to accommodate maximum development of the service area with recognition of possible urban renewal, industrial expansion, etc. Systems shall be designed to provide for future extension with minimal disruption of existing service.
- 402.01.E** As a condition of water service, developments shall provide public water mains of sufficient size for consumption and fire protection to adjacent parcels. This will include the extension of water mains along the street frontages of the property to adjoining properties when the main is located in the street right-of-way and across the property to adjoining properties when the main is located in easements. Property with multiple frontages shall extend water along all frontages. Service lines or laterals, as required, shall be extended to vacant lots if street overlays or reconstruction is contemplated.
- 402.01.F** When a waterline improvement creates parallel water mains within the same street or roadway, the existing waterlines shall be abandoned along the entire path of new waterline construction. In addition to abandonment, all existing services and hydrants shall be transferred of to the new waterline.
- 402.01.G** All waterlines shall be located within the public right-of-way or as directed and approved by the City Engineer. These lines are placed in the public right-of-way for ease of maintenance and access, control of the facility, operation of the facility, and to permit required replacement and/or repair. The City Engineer, under special conditions, may allow a public waterline to be located within a public water easement as referenced in Subsection 102.08.

402.02 WATERLINE PLANS

- 402.02.A** Complete plans and specifications for proposed water distribution system projects, including any necessary public dedications and easements, shall be submitted to the City Engineer for review. Such plans and specifications must receive City Engineer approval prior to construction permit issuance and prior to beginning of construction. Engineering documents shall be prepared by a Professional Engineer registered and licensed in the State of Oregon.



402.02.B Engineering design plans drawn to scale, showing the existing and proposed water system, shall be submitted in accordance with Division 2 of these Design Standards. The proposed plan shall show profile and plan view of the proposed improvements.

402.03 PIPE MATERIALS AND SIZE

402.03.A All public water distribution systems shall be constructed with ductile iron pipe, minimum thickness Class 52. All such pipe shall be cement mortar-lined pipe with push-on or mechanical type joints.

402.03.B When a potential corrosive condition is encountered, all ductile iron pipe and fittings will be polyethylene encased with an 8-mil tubing meeting manufacturer and AWWA Standards. Where an active cathodic protection system is encountered as a result of other utilities, a deviation from the normal pipe design/material/installation practice may be required by the City Engineer.

402.03.C Standard pipe sizes for distribution and transmission mains will be 8-inch, 12-inch, 16-inch, 20-inch, 24-inch, and 30-inch.

402.03.D The pipe material, size, and typical applications are as shown in the following Table:

MINIMUM PIPE SIZE	CRITERIA
1-inch and 2-inch Copper	For services only. 1-inch is minimum size for domestic services and is used for 3/4-inch x 1-inch and 1-inch meters. Maximum length of a 1-inch domestic service is 100 feet, unless otherwise approved. 2-inch services are minimum size for 1.5-inch and 2-inch meters.
6-inch Ductile Iron	Fire hydrant laterals served by minimum 8-inch distribution lines.
8-inch Ductile Iron	Residential zoning distribution water mains for a grid (looped) system, not to exceed an unsupported length of 600-feet and will not be permanently dead-ended. Looping of the distribution grid will be at least every 600-feet.
12-inch Ductile Iron	Commercial, multi-family, and industrial zoning.
16-inch Ductile Iron and larger	As required for specific development demands or transmission mains.

402.03.E Where system static pressures allow and field flow measurement or system modeling shows adequacy, velocities in distribution mains may be designed but shall not exceed 8-feet per second for combined fire, domestic, and irrigation flows. Velocity in service lines shall be designed not to exceed 10-feet per second.

402.03.F For portions of the water system with mid-range to low-static pressures, required flows may not be achievable while still maintaining a minimum system residual of 20 psi. Oversizing of waterlines may be required to achieve the required flows.

402.04 WATER SYSTEM CLASSIFICATION

402.04.A DISTRIBUTION MAINS (12-INCHES AND SMALLER). Mains that are used for servicing consumers.

402.04.B TRANSMISSION MAINS (16-INCHES AND LARGER). Mains used for transporting water from the source of supply and storage reservoirs to the distribution system and distribution reservoirs. Some transmission lines serve a dual purpose as distribution lines also to avoid the need for multiple lines in one location.



403 MINIMUM DESIGN CRITERIA

403.01 VELOCITY AND SLOPE

403.01.A Velocities shall meet the requirements outlined in the following Table.

LINE TYPE	MAX. VELOCITY (FT./SEC)
Distribution	8
Transmission	5

403.01.B All water systems shall be laid on a consistent and uniform grade. When shown on the plans or designated by the City Engineer, combination air/vacuum valves, per the Standard Drawings, shall be installed on transmission and distribution lines at all high points in grade and at other points as determined appropriate by the City Engineer.

403.01.C All water systems laid on slopes greater than 15 percent, or as recommended by pipe manufacturer for slopes 15 percent and less, shall be secured by straddle blocks in accordance with the Standard Drawings. Straddle blocks located at the middle of pipe runs of less than 200 feet are generally adequate, but for spans greater than 200 feet, straddle blocks shall not exceed a spacing of 100 feet.

403.02 HYDRAULIC DESIGN

403.02.A Design capacities shall meet requirements of the current Water Master Plan and its system model and shall be determined by consideration of the following factors and assumptions:

- ❖ Area to be served, both immediate and adjacent
- ❖ Current and projected population within the areas to be served
- ❖ Current and projected land use within the areas to be served
- ❖ Commercial, industrial, or institutional users to be served
- ❖ Changes in any of the above factors that are likely to occur within a foreseeable time period

403.02.B Head loss shall be determined by the Hazen-Williams equation.

$$h_L = \frac{4.726 * Q^{1.852} * L}{C^{1.852} * d^{4.87}}$$

Where:

- h_L = head loss for pipe length L in feet
- Q = Flow in cubic feet per second
- C = Hazen-Williams roughness coefficient
- d = Inside diameter of pipe in feet
- L = Length of pipe in feet



403.02.C The Table below provides the "C" values that are to be used on various pipe diameters for in-service mains.

Pipe Diameter	C Value
8 Inches and Less	100
10 to 12 Inches	110
Greater than 12 inches	120

403.02.D Velocities and head loss shall meet the requirements outlined in the following Table.

LINE TYPE	MAX. VELOCITY (FT./SEC)	MAX. HEAD LOSS (FT./1000 FT.)
Distribution	8	10
Transmission	5	3

403.02.E A 20 psi residual pressure under fire flow conditions shall be maintained in the distribution system.

403.02.F In the absence of consumption data or other reliable information, the following factors are assumptions that shall be used to calculate demands:

PEAK HOUR DEMANDS	
RESIDENTIAL DEVELOPMENT	
Single Family Residence	0.75 gpm
Residential	0.25 gpm per person
COMMERCIAL DEVELOPMENT	
Light	4,500 gal/ac/day
General	7,500 gal/ac/day
Central Business District	6,250 gal/ac/day
INDUSTRIAL DEVELOPMENT	
Park	3,000 gal/ac/day
Light	3,250 gal/ac/day
Heavy	6,300 gal/ac/day

403.02.G Demand for unique commercial installations, industrial users, master planned developments, multiple, and institutional facilities will be reviewed by the City Engineer on an individual basis.

403.02.H FIRE FLOWS

1. The minimum fire flow in single-family residential areas shall be 1,000 GPM at 20 psi residual pressure, except in areas where homes exceed 3,600-square feet or areas of mixed use, in which case the fire flow will be as determined by the Fire Code and the Fire Marshall.
2. Fire flow for commercial and industrial areas shall be as required by the Fire Code and the Fire Marshall.



- 3. The recommended minimum fire flows, at 20 psi residual pressure, shall be as shown in the following Table, unless a more stringent minimum fire flow is required by the Fire Marshall and/or Fire Code.

LAND USE	RECOMMENDED MINIMUM FIRE FLOWS (GPM)	RECOMMENDED DURATION (HR.)
Industrial	5,000	4
Downtown	3,500	3
Commercial	2,500	2
Multiple Family	3,500	3
Single Family	1,000	2
Mixed Use	3,500	3
Schools	5,000	4
Institutional	3,500	3

403.03 THRUST RESTRAINT

403.03.A New water mains shall be constructed of ductile iron with an internal, push-on joint restraint system. All joints shall be installed with restrained gaskets. In addition, any unrestrained joints shall be properly restrained to adequately distribute anticipated thrust loading in accordance with the Standard Drawings. New water mains shall not be restrained externally with concrete reaction blocking without specific approval of the City Engineer (see Standard Construction Specifications).

403.04 WATER MAIN CONFIGURATION

403.04.A The distribution system mains shall be looped at all possible locations. Developments will be required to extend mains across existing or proposed streets for future extensions of other developments. Terminations shall be planned and located such that new or existing pavement will not have to be cut in the future when the main is extended.

403.04.B Tie-ins to existing, non-standard water mains (as to size and material) shall be configured for future extension with minimal impact on local water service (see Standard Construction Specifications). Tie-ins to existing water mains not contemplated for replacement shall be made with 22.5 degree or 45 degree bends. 90 degree bends shall not be used, unless otherwise approved by the City Engineer.

403.05 DEAD-END MAINS

403.05.A Dead-end mains that are permanent or that will be extended in the future shall be provided with a properly sized blow-off, as shown in the Standard Drawings, and located in areas approved by the City Engineer.

403.05.B The installation of permanent or long-term water mains will not be permitted for dead-end mains greater than 250-feet upon which fire protection depends, or for single mains serving relatively large areas, unless otherwise approved by the City Engineer.

403.05.C No more than twenty (20) single-family residences shall be temporarily served from an un-looped waterline during a phased construction, unless approved by the City Engineer.



404 ALIGNMENT AND COVER

404.01 RIGHT-OF-WAY LOCATION

- 404.01.A** Where waterlines are located within narrow rights-of-way (less than 50-feet), location of waterline will be reviewed by the City Engineer on a case-by-case basis.
- 404.01.B** In general, water systems shall be located south or west from the right-of-way centerline or as approved by the City Engineer. Except as provided in Subsection 404.06, all waterlines shall be in the public right-of-way.
- 404.01.C** Curved alignment for waterlines or mains is permitted and shall be parallel to the street centerline when practical. The minimum allowed radius will be based on allowable pipe deflection for the pipe diameter and the pipe laying length. All abrupt changes in vertical or horizontal alignment shall be made with a fitting and adequate thrust restraint. In all cases, when push-on or mechanical joint pipe is to be laid on a curve or abrupt angle either in the horizontal or vertical plane, the amount of deflection shall not exceed the maximum limits recommended by the pipe and fitting manufacturer or by the restrained retainer gland manufacturer, whichever is less.

404.02 MINIMUM COVER

- 404.02.A** The standard minimum cover over buried water mains within the right-of-way shall be 36-inches from finish grade. The minimum cover for water mains in areas without a hard surfacing shall be 48-inches from finish grade, unless approved otherwise by the City Engineer. Finish grade will normally mean the existing or proposed pavement elevation. Where the main is located in the cut or fill side slope or where mains are located in easements, finish grade will mean final ground elevation at the water main alignment.
- 404.02.B** The standard typical trench section shall be utilized for all waterline construction. Refer to the Standard Drawings.
- 404.02.C** Deviation from the above standards will be considered on a case-by-case basis by the City Engineer when the following exists:
1. When there is underlying rock strata that prohibits placement of the water main 36-inches below finish grade. In this situation, a written request must be submitted to the City Engineer that includes a soils report with a plan and profile certifying that bedrock exists less than 3-feet below the undisturbed ground surface.
 2. Substantial utilities exist at an elevation that will conflict with the waterline at 36-inches below finished grade; and installation of the waterline below such utility would cause the new waterline to be at an unreasonably deep elevation below finished grade.
 3. Where the water main or service must be installed at a depth less than 30-inches below finished grade.

404.03 SEPARATION WITH SEWER LINES

- 404.03.A** Water mains and services shall be installed a minimum clear distance of 10-feet horizontally from gravity sanitary sewer mains and laterals, and shall be installed to go over the top of such sewers with a minimum of 18-inches of clearance at intersections of these pipes (in accordance with the



requirements of OAR Chapter 333, Public Water Systems). Separation from sanitary sewer force mains will be reviewed on a case-by-case basis. Exceptions will require the approval of the City Engineer. In all instances, the distances shall be measured edge to edge.

404.04 SEPARATION WITH UTILITIES

404.04.A Unless otherwise approved by City Engineer, the minimum spacing between water mains and storm drains, gas lines, and other underground utilities (except sanitary sewers), shall be 5-feet horizontally when the standard utility location cannot be maintained. This separation also applies to watermains, water service, and utility service lines.

404.04.B Where water mains are being designed for installation parallel with other water mains, utility pipe, or conduit lines, the vertical separation shall be 12-inches below or in such a manner that will permit future side connections of mains, hydrants, or services, and avoid conflicts with parallel utilities without abrupt changes in vertical grade of the above mentioned main, hydrant, or service. Where crossing of utilities is required, the minimum vertical clearance shall be 6-inches.

404.04.C Water mains shall not be installed in alleys, unless otherwise approved by the City Engineer. Wherever possible, mains will be installed on a particular street at a constant distance from the curb. On curved streets, mains may be laid on a curve concentric with the street centerline with deflections no greater than the manufacturer's specifications, or mains may be laid in straight lines along the tangent between selected angle points to avoid conflicts with other utilities. The angle point and tangent section shall not be less than 3-feet in front of the curb face.

404.05 EASEMENTS

404.05.A Easements shall meet the requirements of Subsection 102.08, except as noted below.

404.05.B Any water main placed within a water main easement shall be permanently marked with blue plastic marker signs at all angle points, and no less than every 200-feet. In addition, marker signs shall be placed where the waterline intersects the public right-of-way at the easement location. A monument cap set in the pavement of parking lots, driveways, etc. will be an acceptable alternative to the sign.

404.06 RELATION TO WATERCOURSES

404.06.A Surface water crossings of mains shall be in accordance with Oregon Administrative Rule (OAR) 333 and the following:

1. New water mains may cross under existing streams, rivers, or other bodies of water.
2. Mains crossing stream or drainage channels shall be designed to cross as nearly perpendicular to the channel as possible.
3. Valves and service connections shall be provided at both ends of the water crossing so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding.
4. **ABOVE WATER CROSSINGS** – The pipe shall be designed by the Design Engineer to provide support, anchorage, and protection from freezing and damage, yet shall remain accessible for repair and maintenance. All above water crossings will require review and approval by the City Engineer.



5. UNDERWATER CROSSINGS

- a. The following surface water crossings will be treated on a case-by-case basis:
 - 1) Stream or drainage channel crossing for pipes 12-inches inside diameter and greater.
 - 2) River or creek crossings requiring special approval from the Division of State Lands.
 - 3) Canal crossings requiring special approval from the North Santiam Water Control District.

- b. The minimum cover from the bottom of the surface water to the top of pipe shall be 36-inches. Concrete encasement along the waterline will be required when the cover from the top of the pipe to the bottom of the surface water is 36-inches or less, unless otherwise approved by the City Engineer. The concrete encasement shall extend to a point where a one-to-one slope begins at the top of the bank and slopes down from the bank away from the surface water centerline and intersects the top of the pipe.



405 APPURTENANCES

405.01 VALVES

- 405.01.A** In general, valves shall be the same size as the pipes in which they are installed. Valve types and materials shall conform to the City of Stayton Construction Standard Specifications. Gate valves will be used for applications 8-inch and smaller and butterfly valves for 10-inch and larger.
- 405.01.B** Gate valves shall be resilient seated conforming to AWWA C-509 or C-515 and shall be pressure rated for 200 psi. Butterfly valves shall be short-bodied conforming to AWWA C-504 and be pressure rated for 150 psi. All ductile iron mechanical joint fittings shall be pressure rated at 350psi. Flanged fittings and cast iron mechanical joint fittings shall be pressure rated at 250psi and shall be factory cement mortar lined and coated.
- 405.01.C** In general, a tee-intersection shall be valved in two (2) branches and a cross-intersection shall be valved in three (3) branches. Transmission and distribution water mains shall have valves at not more than 500-foot spacing. Hazardous crossings such as creeks and freeway crossings shall be valved on each side. Valves shall be accessible at all times and shall be restrained and located far enough away from the casing such that the pipe in the casing can be removed and replaced between the valves.
- 405.01.D** When a hydrant tee, or a tee branching to a cul-de-sac blow-off is installed in a sloped waterline, install a main line valve on the up hill run of the tee to allow for release of air from hydrant or blow-off. An additional main line valve may be needed on the down hill run of the tee for other operational purposes.
- 405.01.E** Distribution tees and crosses with valves for future branch lines on mains may be required at the direction of the City Engineer. Inline valves for mains may be required as directed by the City Engineer.
- 405.01.F** Water mains installed by phased construction, which will be extended in the future, shall terminate with a blowoff assembly in a location approved by the City Engineer.

405.02 FIRE HYDRANTS

- 405.02.A** Fire hydrants shall be Kennedy K-81D Guardian, Waterous 5 1/4 Pacer, or approved equal. Fire hydrants shall be "high gloss safety yellow" in color and painted or epoxy coated by the manufacturer.
- 405.02.B** No fire hydrant shall be installed on a main of less than 8-inches inside diameter. The fire hydrant lateral shall be a minimum of 6-inches nominal diameter.
- 405.02.C** Fire hydrant installation shall conform to the Standard Drawings. Maximum 6-foot bury fire hydrants will be required in all installations. Installation of fire hydrant extensions will not be allowed, unless specifically approved by the City Engineer.
- 405.02.D** Each fire hydrant shall have an auxiliary valve and valve box that will permit repair of the hydrant without shutting down the main supplying the hydrant. Such auxiliary valves shall be resilient-wedge gate valves. The auxiliary valve shall have mechanical joint-by-flange joint ends and connected directly to the water main using a flange joint tee and "Megalug" retainer glands or approved equal. Refer to the Standard Drawings.



405.02.E Each hydrant shall have a 5-inch Storz adaptor with a cap installed on the 4 1/2-inch pumper nozzle.

405.02.F Where necessary or required, bollards (guard posts) shall be constructed at the corners of a 7-foot square with the fire hydrant located in the center for protection from vehicles. Clear access of the fire hydrant ports shall be maintained at all times.

405.02.G SPACING

1. The distribution of fire hydrants shall be based upon the required average fire flow for the area served. Design coverage shall result in hydrant spacing of approximately 500-feet in residential areas and 300-feet in commercial or industrial subdivisions. Where approved, this spacing may be reduced by 100-feet on dead end streets. In all cases, a fire hydrant shall be no further than 250-feet from any building. Additional fire hydrants shall be placed as required by the City Engineer.
2. Where new water mains are extended along streets where fire hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at a spacing not to exceed 1,000 feet to provide for transportation hazards.
3. The minimum requirements for spacing and minimum number of fire hydrants for all development types shall comply with the Oregon Fire Code.

405.02.H LOCATION

1. Fire hydrants shall be placed on the same side of the right-of-way as the waterline serving the fire hydrant. Other proposed locations will require approval by the City Engineer
2. Fire hydrants shall be located at the back of the existing or proposed sidewalk, in the planter strip, or where approved, behind the sidewalk if adequate right-of-way exists. Residential fire hydrants shall be located as near as possible to the corner of street intersections and shall be located at or near the point of curvature of the curb return or at a common property line.
3. The pumper port of fire hydrant shall be perpendicular to the curb line or shoulder as applicable. If any public fire hydrant encroaches on private property (where approved), an easement must be provided to the City.
4. Fire hydrants shall not be further than 15 feet from an approved access road, shall not be located within 20-feet of any building, and shall not be blocked by parking, unless specifically approved by the Fire Marshall.
5. A fire hydrant shall be located within 70 feet of a fire department connection. The fire department connection and the fire hydrant should be on the same side of a fire access road.
6. Fire hydrants and fire department connections shall not be obstructed and shall not be installed closer than 5-feet from any utility (above or below ground), pole, guy wire, sign, or other obstruction. In addition, a utility (above or below ground), pole, guy wire, sign, or other obstruction shall not be placed less than 5-feet from an existing hydrant. A 5-foot clear space shall be provided at all times.
7. Considerations for placing fire hydrants shall be as follows:



- a. Where approved, existing fire hydrants in the area may be used to meet the required number of fire hydrants; however, fire hydrants that are over 500 feet away from the nearest point of the subject building shall not contribute to the required number of hydrants.
- b. Fire hydrants that are separated from the subject building by railroad tracks shall not contribute to the required number of hydrants.
- c. Fire hydrants that are separated from the subject building by a highway, arterial street, or major collector street shall not contribute to the required number of fire hydrants, unless specifically approved by the Fire Marshall.
- d. Fire hydrants that are accessible only by a bridge may be allowed to contribute to the required number of hydrants, only if specifically approved by the Fire Marshall.
- e. Private fire hydrants or public fire hydrants that are on adjacent private property shall not contribute to the required number of hydrants for the subject building.
- f. When evaluating the placement of fire hydrants at commercial or industrial complexes the first hydrant(s) to be placed shall be at the primary access and any secondary access to the site. After these fire hydrant(s) have been placed other fire hydrants shall be sited to meet the requirements for spacing and minimum number of fire hydrants.

405.03 PRESSURE-REDUCING VALVE ASSEMBLIES

- 405.03.A** The City's water distribution system is divided into several pressure zones. Where water systems cross these zone lines, a pressure-reducing valve station may be required. The specific design and location for such valves will be reviewed by the City Engineer.

405.04 COMBINATION AIR/VACUUM VALVE ASSEMBLIES

- 405.04.A** When shown on the plans or designated by the City Engineer, combination air/vacuum valves, per the Standard Drawings shall be installed. Such valves will be required on large diameter transmission and distribution lines at all high points in grade and at other points as determined appropriate by the City Engineer.

405.05 RAILROAD OR HIGHWAY CROSSINGS

- 405.05.A** Railroad or road crossings of a hazardous nature, or as deemed necessary by the City Engineer, shall be valved on both sides of the crossing. Casing under railroad or road crossings, where required, shall be as specified in the permit from the respective agency.



406 WATER SERVICE LINES

406.01 GENERAL

- 406.01.A** The sizes of water service lines that may be used are 1-inch and 2-inch copper, 4-inch, 6-inch, 8-inch, and 12-inch ductile iron. Water service lines will be reviewed for impacts on the distribution system and shall not be greater in size than the distribution main. In no case shall a new service be connected to an existing galvanized waterline, unless specifically approved by the City Engineer.
- 406.01.B** Domestic service lines 1-inch and 2-inches shall normally extend from the main to behind the curb with an angle meter valve and meter box located at the termination of the service connection. See the Standard Drawings.
- 406.01.C** Multiple service connections to a premise shall be laid out to follow a logical sequence of addresses to facilitate matching of service connection to building(s). Onsite waterlines shall be laid out to facilitate a logical matching of service connection to building and address. Each meter must have its own service line and connection to a water main.
- 406.01.D** When a potential corrosive condition is encountered and the copper service passes over or under an active cathodic protection system, the service shall be installed in a Schedule 40 PVC conduit for a distance of 10-feet on each side of the active system. All conduit placements shall be included in the as-built drawings.
- 406.01.E** Unless otherwise approved by the City Engineer, services and lines to be abandoned shall be removed completely back to the line that will remain in service. Existing corporation stops shall be removed and replaced with an approved watertight plug at the water main. The plugs shall not be of dissimilar metals.

406.02 METERS

- 406.02.A** Meters will be provided and installed by the City with costs being the responsibility of the Developer. Meter boxes are to be provided and installed by the Developer. Individual service connections shall terminate in front of the property to be served along the street frontage where property is addressed, and shall be located 18-inches each side of a common side property line. Water service via an easement across a separate tax lot is not allowed unless specifically approved by the City Engineer.
- 406.02.B** For 3/4-inch through 2-inch water meters, the meter shall be located at the termination of the City service line. Except for single-check devices (where approved), meters shall not be located in the same meter box or vault with a backflow prevention device, unless otherwise approved.
- 406.02.C** For 3-inch and larger water meters, the meter shall be installed in vaults and shall be located in the public right-of-way at the entrance to the property being served, unless otherwise approved by the City Engineer, to allow easy reading and maintenance without entering private property. The vault shall be accessible by a crane truck to within 10-feet of the installation with a 10-foot vertical clearance over the vault.
- 406.02.D** Provisions shall be made for a minimum 3-foot clear space around the vault to provide ample working space for maintenance. The vault shall be located such that storm water will not pond or flow into the installation. A design drawing and details must be submitted to the City showing the vault and fitting requirements, the expected flow (normal and maximum daily flow) requirements, and proposed usage.



406.02.E The following table provides general design criteria for water service and meter sizing (*based on Sensus SR-II and OMNI C² Meter Specifications*):

GENERAL DESIGN CRITERIA WATER SERVICE AND METER SIZING			
Service Size (Inches)	Meter Size (Inches)	Maximum Meter Design Flow⁽¹⁾⁽²⁾ (GPM)	Pressure Loss Through Meter (PSI @ GPM)
1	3/4	30	9 @ 30
1	1	50	7.3 @ 50
2	1 1/2	200	6.9 @ 160
2	2	200	4.3 @ 160
4	3	500	3.2 @ 400
4	4	1000	6.4 @ 800
6	6	2000	5.5 @ 1600
8	8 ⁽³⁾	By Design Engineer	By Design Engineer

Notes: 1. Continuous flow not to exceed 30% of maximum design flow for 3/4-inch and 1-inch disc meters.
 2. Continuous flow not to exceed 50% of maximum design flow for all 1 1/2-inch and larger compound meters.
 3. Meters 8-inches and larger will be reviewed on a case-by-case basis.

406.03 FIRE SERVICES

406.03.A There are three (3) categories of private fire services: (1) hydrants (private hydrants, except for large industrial sites are not allowed), (2) fire sprinkler lines, and (3) combination hydrant and fire sprinkler lines.

406.03.B The fire service lines shall extend from the water main to the property line, and end with an approved vault, metering device, and valves. An approved backflow prevention assembly will be required of the property being served. To minimize maintenance problems, the placement of an approved backflow prevention assembly within the building they serve is encouraged. The fire service line serving the building shall be placed in an easement. Additional valving is required to delineate the public and private portions of the fire service lines.

406.03.C The flow meter and sensor (Data Industrial Series 1400 w/220 MB sensor or approved equal) for fire service lines will be installed by the City, unless directed otherwise. All costs will be the responsibility of the Developer.

406.03.D Provide the fire water service vault, backflow preventer, and sump and drain details. The backflow prevention assembly for the 6" fire line shall be a detector type since this connection will be unmetered. Coordinate with the Building Official, Fire Code Official, and OAR 333-061-0070 for the appropriate backflow prevention assembly type and fire department connection as necessary. Provide the appropriate detector type detail and callouts on the plans. Show the vault sump and drain to an approved location.

406.03.E Fire service lines serving only fire sprinkler systems shall be metered by a detector meter on the approved backflow assembly.



406.03.F Fire sprinkler systems for single-family residences shall be served through a standard metered service. The fire sprinkler system may be served through the domestic service for the same residence. The combined domestic, irrigation, and fire sprinkler flow demands may not exceed the allowable flow for that particular size of service and meter.

406.04 MANUFACTURED HOME PARKS AND MASTER PLANNED DEVELOPMENTS

406.04.A Private distribution systems for manufactured home parks and master planned developments are reviewed and approved by Marion County Building Department and the Fire Code Official. Private distribution systems shall be designed in accordance with the Oregon Plumbing Specialty Code.

406.04.B Public water mains within manufactured home parks and planned unit developments shall be in exclusive easements to the City and built to public standards.



407 CROSS CONNECTION AND BACKFLOW PREVENTION

407.01 GENERAL

- 407.01.A** Cross connection control and backflow assemblies shall conform to the requirements of the Oregon Administrative Rules Chapter 333, the Oregon Plumbing Specialty Code, NFPA, and Marion County Building Department.
- 407.01.B** An approved backflow prevention assembly is required on all fireline systems, domestic water service 1 1/2-inch and larger, irrigation services, fire sprinkler systems, and/or structures or areas having potential health hazards in accordance with OAR 333-061-0070.
- 407.01.C** It is the Design Engineer's responsibility to select the proper backflow prevention assembly and vault and to include the proper engineering drawings and detail sheets with both the site development permit and site plumbing permit application, as applicable for the particular circumstances. The Design Engineer is responsible for coordinating with the City Engineer, Contractor, and Marion County Building Official.
- 407.01.D** If there is a change in the use or proposed use of the building served by the approved backflow prevention device, or other factors that requires an alternative backflow prevention design, it is the Design Engineer's responsibility to select an alternative backflow prevention assembly and vault as required to reflect the change, and to submit new detail drawings for review.
- 407.01.E** City approval of the engineering plans and detail drawings within a plan set for a development is not formal approval of the private backflow prevention assemblies and vaults in said plan set. Further, City approval of plans and detail drawings within a plan set does not relieve the Design Engineer of any of the aforementioned responsibilities.



408 REQUIREMENTS FOR WATER SYSTEM VAULTS

408.01 GENERAL

408.01.A Vaults for water meters, PRVs, fire services, and combination air and vacuum release valves, and vaults' appurtenances including but not limited to ladders, access doors, sump pumps, and drains, shall conform to the Standard Drawings and the requirements shown in Subsection 408.02 below.

408.02 VAULT REQUIREMENTS

- 408.02.A Vault shall be as manufactured by Utility Vault, or approved equal. Vault shall have no other use, except for use described by these Standards.
- 408.02.B Access into the vault shall be through a standard Bilco door unless otherwise approved by the City Engineer. All Bilco doors on any public vault in the public right-of-way shall be structurally adequate for an H-20 loading. If any public or private vault is within a parking or maneuvering area (including the travel lane of any public or private street), the Design Engineer shall evaluate the specific loading conditions and specify the proper door for those loading conditions. The Design Engineer's evaluation and recommended lid design shall be submitted to the City Engineer for review.
- 408.02.C An approved ladder shall be provided if the vault or chamber depth is five (5)-foot or greater and entry is through the vault or chamber roof. Approved ladder extensions shall comply with OSHA requirements as required by City, State, and Federal standards.
- 408.02.D Adequate drainage that prevents water from accumulating on the vault or chamber floor shall be provided for the vault or chamber. Trapped water in the vault shall be drained to daylight by gravity or an approved duplex sump pump system. In no case shall the drainage be connected to a piped sanitary or storm water system. If a duplex sump pump system is utilized, the pumps shall be capable of removing accumulated water from the vault with a minimum flow rate of five (5) gallons per minute (GPM). The pumps shall be equipped with an automatic flow switch; the pumps and all the wiring shall conform to the National Electrical Code requirements.
- 408.02.E Vault shall not be installed in areas that are subject to ponding water or flooding. Vault shall be protected from freezing and other severe weather conditions in accordance with NFPA requirements.
- 408.02.F Vault shall be installed on 4-inch min thick compacted 1-inch minus granular base rock over stable subgrade. Backfill around the vault shall be in accordance with the Standard Construction Specifications, and in accordance with the manufacturer's recommendations. Vault pick holes shall be sealed with non-shrink grout. Vault pipe penetrations shall be installed with link-seal modular seals, or approved equal.
- 408.02.G Piping shall be adequately supported from the floor and suitably restrained from movement. Supports shall consist of approved steel supports with corrosion protection; no wood supports shall be used. Piping shall be readily accessible with adequate room for maintenance. Access shall remain clear at all times.
- 408.02.H No piping shall be installed in excess of three (3) feet above the vault floor. Piping shall have a minimum 12-inch clearance on the backside, 24-inch clearance on any test-cock side, and 12 inches below the piping from the vault. Adequate clearance (three (3) inches minimum) must be maintained above gate-valve stem at full extension. Headroom of six (6) feet is required in vaults without a full opening top.



- 408.02.I** Where required, vaults shall be equipped with a moisture proof light fixture. All electrical wiring shall be inspected by Marion County Building Department (permit is required). The Design Engineer shall obtain a copy of final electrical inspection from the Contractor and submit it to the City.
- 408.02.J** All new services shall be pressure tested and disinfected by the Contractor and proven to be bacteriologically safe from the existing main to the vault.

409 DISINFECTION, PRESSURE AND LEAKAGE TESTING

409.01 GENERAL

- 409.01.A** New water systems (lines, valves, hydrants, services, etc.) shall be pressure tested, chlorinated, and tested for bacteria in accordance with the Standard Construction Specifications, OAR Chapter 333, Division 61 Drinking Water, AWWA C-651 through C-654, and shall be performed in the presence of the City Engineer.
- 409.01.B** No connection to existing water systems shall be made until the new water system has been tested and accepted.

410 WATER QUALITY SAMPLING STATIONS

410.01 GENERAL

- 410.01.A** If a water sampling station is required by the City for a particular development (typically 1 station to 20 lots in new subdivisions), the sampling station shall be provided and installed by the Developer. Details pertaining to the water quality sampling station shall be coordinated with the City Engineer. See Standard Drawings.

*** END OF DIVISION***

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DIVISION 5

SANITARY SEWERS

501 GENERAL

501.01 AUTHORITY AND PURPOSE

- 501.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City. Most of the elements contained in these Design Standards are public works oriented and it is intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements.
- 501.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects that ultimately will be owned, operated, or maintained by the City shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 501.01.C** The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of public improvements shall be implemented. All public system improvements and public works facilities shall be designed and constructed in accordance with applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals, and in accordance with applicable federal, state, and local statutes and rules. Approval of public improvements must be made by the City Engineer or the Public Works Director before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- 501.01.D** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every public improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 501.01.E** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.



- 501.01.F** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such variance will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.
- 501.01.G** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. Request must show that the variance meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All requests will be in writing and be accompanied by engineered drawings and final design calculations.
- 501.01.H** All franchise utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City Standards.
- 501.01.I** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.
- 501.01.J** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 501.01.K** On completion of projects to become public works, the Design Engineer shall submit one complete set of reproducible "Record Drawings" (As-Builts), a compact disc (CD) containing electronic PDFs and cad files (AutoCAD or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification.
- 501.01.L** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 501.01.M** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.
- 501.01.N** The objective of these Design Standards is to meet the intent of the wastewater master plan and to ensure the following:
- ❖ The system shall be designed to provide necessary sanitary sewer infrastructure within the City of Stayton and shall incorporate system best management practices.
 - ❖ The system shall have the necessary hydraulic capacity to safely convey all design flows and shall be of sufficient depth to adequately serve the basin for which they are constructed. The use of individual sanitary sewer sump-pump systems for specific properties shall not be used unless approved by the City Engineer.
 - ❖ The system components shall have adequate structural strength to safely withstand all expected external design loads.
 - ❖ The system shall be designed and configured to prevent infiltration and inflow of ground and surface waters.
 - ❖ The system shall be designed to be economical and safe to construct and maintain.
 - ❖ The system shall be designed to minimize maintenance and operational requirements.



501.02 APPLICABILITY

501.02.A These Design Standards shall govern the design for the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Design Standards.

501.03 REFERENCES

501.03.A These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Subsection 101.03 and others specifically listed below. Projects are expected to be consistent with the following:

1. Applicable design criteria and concepts consistent with the most recent Wastewater Master Plan adopted by the City of Stayton unless more restrictive criteria are identified herein. Where additional detailed information and background is required for a particular project, the Wastewater Master Plan shall be referred and adhered to, as applicable. Any deviations from the Wastewater Master Plan shall be flagged and presented to the City Engineer for consideration. The most recent version of the City's sewer model (XP-SWMM) shall be used to model improvement requirements.
2. Applicable design criteria and concepts in accordance with the rules and regulations of the Oregon Department of Environmental Quality (DEQ) as established in the Oregon Administrative Rules, Chapter 340, Division 52, and as presented in the DEQ publication "Oregon Standards for Design and Construction of Wastewater Pump Stations" and DEQ publication "Guidelines for Writing Pump Station O&M Manuals".
3. State of Oregon Plumbing Specialty Code.
4. Applicable design guidelines published by the American Society of Civil Engineers.

501.04 SPECIAL DESIGN APPLICATIONS

501.04.A Special design applications not covered in these Design Standards require review and approval by the City. Additional review and approval by the Department of Environmental Quality (DEQ) may also be required. Submittal of full design calculations, supplemental drawings, and information will be required prior to any approval.

501.04.B Such design applications requiring special review and approval include, but are not limited to, the following:

- ❖ Wastewater Facilities
- ❖ Sewer Outfalls
- ❖ Pump Stations and Force Mains
- ❖ Electrical/Monitoring/Telemetry Devices
- ❖ Siphons
- ❖ Internal Sealing of Existing Sewers
- ❖ Relining of Existing Mains
- ❖ Energy Dissipators
- ❖ Hydrogen Sulfide and/or Hazardous Gases



501.05 STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS

501.05.A Except as otherwise provided by these Design Standards, all construction design detail, workmanship, and materials shall be in accordance with the current edition of the City of Stayton Public Works Standard Construction Specifications and Standard Drawings.

501.06 CITY POLICY REGARDING ENGINEERING

501.06.A It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.

501.06.B Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction, and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.

501.06.C City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required; the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.

501.07 CONVENTIONS USED THROUGHOUT THE DESIGN STANDARDS

501.07.A See Subsection 101.07 for conventions used throughout these Design Standards.

501.08 ORGANIZATION AND CLASSIFICATION OF DIVISIONS

501.08.A See Subsection 101.08 for the organization and classification of divisions throughout these Design Standards.

501.09 CLARIFICATIONS, MODIFICATIONS, AND REVISIONS TO DESIGN STANDARDS

501.09.A These Design Standards will be periodically updated due to changes in policy or procedures, new technology, and methods of design and construction. Periodic revisions to these Design Standards will be necessary to maintain consistency in that regard. The date appearing on the title page is the date of the latest revision for each Division. Parenthetical notations at the bottom of each page indicate the most recent change. It will be the user's responsibility to obtain and maintain his/her copy of these Design Standards with the latest changes.



501.09.B See Subsection 101.09 for general policies and procedures regarding clarifications, modifications, and revisions to the Design Standards.

501.10 DEFINITIONS AND TERMS

501.10.A See Subsection 101.10 for standard definitions and terms used throughout these Design Standards.



502 GENERAL DESIGN REQUIREMENTS

502.01 PERFORMANCE STANDARDS

- 502.01.A** Sanitary sewer system design shall meet the policies and guidelines of the latest Wastewater Master Plan and its updates.
- 502.01.B** Sanitary sewer systems shall be designed to provide gravity service to all areas of development, unless otherwise approved by the City Engineer.
- 502.01.C** Sanitary sewer system capacity shall be designed for ultimate development density of the contributing area. The system shall allow for future system extension and for future development based on current and on proposed land use designations.
- 502.01.D** Sanitary sewer systems shall be designed to remove industrial waste and to remove domestic sewer from basements of houses (where practical), commercial or industrial buildings, and all public and private establishments where possible.
- 502.01.E** Stormwater and groundwater, including but not limited to, street, roof, footing drainage, water features, etc. shall not be connected to or will be allowed to discharge into the sanitary sewer system, but shall be removed by a system of storm drains or by some other method separate from the sanitary sewer system.
- 502.01.F** Unpolluted or non-contact cooling waters shall not be discharged into sanitary sewer systems. The overflow drains and filter backwash lines of swimming pools and "hot tubs" shall drain into a sanitary sewer system, in accordance with the Stayton Municipal Code requirements.
- 502.01.G** As a condition of sanitary sewer service, all developments will be required to provide public sanitary sewer systems to adjacent upstream parcels in order to provide for an orderly development of the drainage area. This shall include the extension of sanitary sewer mains in easements across the property to adjoining properties, and across and along the street frontage of the property to adjoining properties when the main is located in the street right-of-way. This shall include trunk lines that are sized to provide capacity for upstream development.
- 502.01.H** All public sanitary sewer systems shall be located within the public right-of-way or as directed and approved by the City Engineer. These sanitary sewer systems are placed in the public right-of-way for ease of maintenance and access, control of the facility, operation of the facility, and to permit required replacement and/or repair. The City Engineer, under special conditions, may allow a public sanitary sewer system to be located within a public sewer easement as referenced in Subsection 102.08.
- 502.01.I** Design shall comply with Oregon Department of Environmental Quality sewer design guidelines, OAR 340, Division 52.
- 502.01.J** For any project requiring construction within or adjacent to watercourses and/or wetlands, in addition to approval by the City, permits from the appropriate responsible agencies (Oregon Department of Fish and Wildlife, Oregon Division of State Lands, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, etc.) shall be obtained. Copies of all permits, or written evidence that no permit is required shall be given to the City prior to City approval of the construction plans.



502.01.K When connection to a public sanitary sewer system is not practical as determined by the City, subsurface wastewater disposal may be permitted when approved by City Engineer and Marion County Sanitarian. All subsurface disposals shall meet and comply with Marion County and Department of Environmental Quality requirements.

502.02 SANITARY SEWER PLANS

502.02.A Complete plans and specifications for proposed sanitary sewer projects, including any necessary public dedications and easements, shall be submitted to the City Engineer for review. Such plans and specifications must receive City Engineer approval prior to construction permit issuance and prior to beginning of construction. Engineering documents shall be prepared by a Professional Engineer registered and licensed in the State of Oregon.

502.02.B Engineering design plans drawn to scale, showing the existing and proposed sewer system, shall be submitted in accordance with Division 2 of these Design Standards. The proposed plan shall show profile and plan view of the proposed improvements.

502.03 PIPE MATERIALS AND SIZE

502.03.A All public sanitary sewer systems shall be constructed with ASTM D-3034, SDR35 PVC pipe as specified in the Standard Construction Specifications. Where required for added strength, AWWA C-900, or AWWA C-905 PVC Pipe shall be used. ASTM C-76 reinforced concrete pipe shall only be used where specifically approved by the City Engineer. Class 52 or higher ductile iron pipe shall be used when added strength is needed and pipe wall thickness is limited. Solid wall HDPE pipe may be used in boring, jacking, pipe bursting, and other similar applications when approved by the City Engineer. Tracer wire shall be a minimum 12-gauge, green-coated copper wire and shall be installed with all plastic pipe. Regardless of selected pipe material, all joints shall be watertight.

502.03.B Regardless of the size of the area being served, the standard minimum pipeline diameter for all mainline sanitary sewers shall be 8-inches, unless otherwise approved by the City Engineer.

502.03.C Proposed sewers that are larger than required, but which are solely recommended in order to meet grade requirements, are not allowed. Surcharging shall not be designed into the collection system.

502.03.D Public sewer service laterals to single family residential properties shall be 4-inches in diameter. Minimum 6-inch diameter sewer service laterals shall be used for multi-family or commercial properties.

502.04 SANITARY SEWER SYSTEM CLASSIFICATION

502.04.A PRIVATE SERVICE LATERAL. A private service lateral is that part of each property's sanitary sewer service line that is on private property outside right of ways or public easements, typically 4-inches in diameter.

502.04.B PUBLIC SERVICE LATERAL. A public service lateral is that part of each property's sanitary sewer service line which extends from the public sewer main to the limit of the public right of way, and is used for servicing the individual consumer, typically 4-inches in diameter. For sanitary sewer mainlines located within public easements, the limit of the public service lateral will be the edge of a sanitary sewer easement. The city shall install and maintain for one year



from the date of final inspection all sewer service connections. Maintenance after this date becomes the responsibility of the user.

502.04.C COLLECTOR SEWER. A public sewer main which one or more service laterals and/or other collector sewers connect or may connect, typically 8-inches in diameter.

502.04.D TRUNK SEWER. A public sewer main ten (10) inches and larger which has been, or is being constructed to accommodate more than one collector sewer. Trunk Sewers may in some cases function as a collector sewer.



503 MINIMUM DESIGN CRITERIA

503.01 SANITARY SEWER STUDY

503.01.A A separate study may be required by the City to justify a proposed project or development which poses unique or special situations or that is otherwise deemed necessary by the City. The sanitary sewer study shall provide detailed information on all engineering design aspects and considerations for City review and approval. The study shall include analysis of the potential upstream contributions and downstream capacities until the contribution is 10 percent or less of the total flow. The study shall include, but not be limited to, sewer service area map, sewage flow calculations, pump systems, and pipe hydraulic calculations. The study shall project sewer grade to upstream parcels within the basin to assure gravity service. The study map shall include as a minimum the following:

- ❖ Streets and street names
- ❖ Lot lines
- ❖ Contours or other form of ground surface elevation information
- ❖ Proposed and future pipe system, complete with manholes, pipe slopes, manhole flowline elevations, and pipe sizes
- ❖ Existing gravity stormwater drainage systems and other possible conflicting utilities
- ❖ Ultimate service area boundaries (from Wastewater Master Plan and consultation with the City)
- ❖ Delineated Sub-service area boundaries according to land use, as appropriate
- ❖ North arrow, scale, etc.
- ❖ Company name, designer's name, date, etc.
- ❖ Link-node data set with coordinates in digital format, if applicable

503.01.B Design calculations for pump stations, pipe sizing and design flows must be stamped by an Oregon Registered Professional Engineer and submitted to the City.

503.01.C When two or more existing sanitary sewers are available for use by a new development, an engineering study may be required to ensure adherence to established sanitary sewer drainage boundaries.

503.02 DESIGN FLOW CRITERIA

503.02.A All collection system components shall use and be consistent with the engineering design criteria and concepts presented in the most recent Wastewater Master Plan and updated environmental regulations and/or monitoring/modeling information. Where additional detailed information and background is required for a particular project, the Wastewater Master Plan shall be referred and adhered to. Each system shall be designed to serve its respective drainage basin, as shown in the most current Wastewater Master Plan.

503.02.B In sizing the collection system, the general wastewater design flow criteria to be followed is shown in the Table below (refer also to the Wastewater Master Plan). The wastewater design flow criteria shown in the Table below may be modified if more current or other relevant information is available to support the change. Population calculations used to forecast service area flows shall be consistent with the Wastewater Master Plan. The Design Engineer shall refer to and coordinate with the most recent version of Stayton's Comprehensive Plan.



503.02.C In addition to the wastewater design flow criteria listed below, all sewers shall be designed with reserve capacity to allow for unforeseen increases in flow due to land-use changes. The Design Engineer shall be prepared to submit for review pipe-sizing design calculations. These calculations shall include the maximum and minimum daily flows based upon population estimates, land-use assumptions, and all other assumed factors relative to the wastewater design flow criteria listed in the Table below.

503.02.D If there are no specific project values for the amount of sewage to be generated, the following design values shall be used:

WASTEWATER DESIGN FLOW CRITERIA	
Persons per Single Family Residence	2.7
Residential Average Flow Allowance	100 gal/per-capita/day
Multi-Family/Commercial/Commercial Retail Average Flow Allowance	1,500 gal/gross-acre/day
Industrial Commercial Average Day Flow Allowance	1,500 gal/gross-acre/day
Light Industrial Average Day Flow Allowance	2,000 gal/gross-acre/day
Industrial Ag Average Day Flow Allowance	2,500 gal/gross-acre/day
Heavy Industrial Average Day Flow Allowance	2,500 gal/gross-acre/day
Residential Flow Peak Day Factor	2.5
Residential Flow Peak Hour Factor	3.0
Commercial Flow Peak Hour Factor	Project specific (3.0 min)
Industrial Flow Peak Hour Factor	Project specific (3.0 min)
Service Area Infiltration/Inflow Allowance (see 503.02.E below)	1,000-gal/gross-acre/day

503.02.E In addition to the daily wastewater design flows shown in the Table above, an allowance of 1,000-gallons/gross-acre/day shall be added for all the land area in the basin being served to account for inflow and infiltration (I&I). A peak hour factor of 3.0 minimum shall be applied to the daily wastewater flow. The wastewater design flow in gallons per day (gpd) is then calculated as: (Acres * (1,000 + DWF * 3.0)) where DWF = Daily Wastewater Flow in gpd/acre from Table above.

503.02.F The pipe size shall be based on the minimum size needed for the design flow, including the upstream basin, and not the size needed to result in a desired slope. The pipe size shall be determined by using one-half (1/2) of the maximum gravity flow capacity of the pipe for pipes 15-inches in diameter and less, and shall be two-thirds (2/3) for pipes larger than 15-inches in diameter.

503.03 VELOCITY AND SLOPE

503.03.A All sanitary sewer pipes shall be designed at a grade that produces a mean velocity of the sanitary sewer design flow of no less than 2-feet per second and not more than 15-feet per second when the pipe is flowing full or half-full. If topography requires a grade that would result in a velocity greater than 15-feet per second in one pipe section, additional drop manholes shall be installed as required by the City. The velocity shall be calculated using the sanitary sewer design flow for the basin to be served now and at ultimate design flow in the future.



503.03.B All sewers shall be laid on a consistent and uniform grade. Changes in piping size and grade shall only occur at manholes.

503.03.C For verification purposes the following Table of minimum pipe slopes shall be used. Actual slopes shall be determined by the actual sanitary sewer design flow.

Pipe Size (Inches)	Minimum Slope in Percent (feet per 100 feet)
8	0.40
10	0.28
12	0.22
15	0.20
18	0.20
21 and larger	0.20

503.03.D All sanitary sewer systems laid on slopes greater than 15 percent, or as recommended by pipe manufacturer for slopes 15 percent and less, shall be secured by anchor block in accordance with the Standard Drawings. Anchor blocks located at the middle of pipe runs of less than 200 feet between manholes are generally adequate, but for spans greater than 200 feet, anchor walls shall not exceed a spacing of 100 feet.

503.04 **HYDRAULIC DESIGN**

503.04.A The Design Engineer shall submit calculations for each sanitary sewer system to be installed, exclusive of sewer service laterals.

503.04.B When calculating volumes, slopes, and velocities, the Manning Formula shall be used. Note that new PVC or HDPE pipe likely have a manufacturer's "n" value of approximately 0.009. However, regardless of pipe material, sand, grit, and slime will build up on pipe walls. This results in true "n" values over time of approximately 0.013. As a consequence, a Manning coefficient of 0.013 shall be used for design of PVC or HDPE piping systems. If an alternative piping material is approved, either the pipe manufacturer's recommended coefficient shall be used or an "n" value of 0.013, whichever is greater.

503.04.C The Manning Formula is expressed by the following equation:

$$V = (1.486/n) * (R^{(2/3)}) * (S^{0.5})$$

Where:

- V = Mean velocity of flow in feet per second (V=Q/A).
- n = Manning's n, 0.013 minimum for pipe.
- R = Hydraulic Radius in feet, defined as the area of flow divided by the wetted perimeter (A / WP);
- A = cross sectional flow area in square feet.
- WP = wetted perimeter in feet.
- S = Slope of hydraulic grade line in feet per feet.

503.04.D In terms of discharge, the above formula becomes:

$$Q = (1.486/n) * A * (R^{(2/3)}) * (S^{0.5})$$



Where:

Q = rate of flow, cfs;

V = Mean velocity of flow in feet per second ($V=Q/A$).

n = Manning's n, 0.013 minimum for pipe.

R = Hydraulic Radius in feet, defined as the area of flow divided by the wetted perimeter (A / WP);

A = cross sectional flow area in square feet.

WP = wetted perimeter in feet.

S = Slope of hydraulic grade line in feet per feet.



504 ALIGNMENT AND COVER

504.01 RIGHT-OF-WAY LOCATION

- 504.01.A** Sanitary sewer systems shall be located in the street right-of-way and shall be located 5-feet north or east of the right-of-way centerline as shown in the Standard Drawings. Any deviations will be reviewed on a case-by-case basis and will require City approval.
- 504.01.B** Curved alignments in sanitary sewer systems, vertically or horizontally, are not permitted.
- 504.01.C** All changes in direction and size of pipe shall be made at an approved manhole.
- 504.01.D** Where approved by the City Engineer, public sewer systems serving a master planned development, apartment complex, or commercial/industrial development shall be in parking lots, private drives, or similar open areas that will permit an unobstructed vehicle access for maintenance by City forces.

504.02 MINIMUM COVER

- 504.02.A** All sanitary sewer systems shall be laid at a depth sufficient to drain sewer service laterals, to protect against damage by frost or traffic, and to drain basement sewers where practical. Sufficient depth shall mean the minimum cover from the top of the pipe to finish grade at the sanitary sewer alignment. In new residential hillside subdivisions, mainline and sewer service laterals shall be placed in the street at a depth sufficient to drain sewer service laterals on the low side of the street.
- 504.02.B** Sanitary sewer systems in residential areas shall be placed with the following minimum cover, unless otherwise approved by the City Engineer:
1. PUBLIC SEWER SERVICE LATERALS – 5-feet at roadway curb and gutters, measured from the top of pipe to roadway gutter finish grade (flow line).
 2. PUBLIC SEWER MAINS (TRUNKS AND COLLECTORS) – Generally 6-feet to 8-feet in roadways and easements, measured from the top of pipe to roadway or easement finish grade.
- 504.02.C** Deviations from the above standards will be considered when one of the following circumstances exists. Deviations will require City approval and will be reviewed on a case-by-case basis.
1. EXISTING SHALLOW SEWERS – Where the topography is relatively flat and existing sewers are shallow (5-feet or less), the minimum cover shall be 4-feet, measured from top of pipe to finish grade.
 2. UNDERLYING ROCK STRATA – A request in writing to the City Engineer, together with submittal of a soils report, with a plan and profile certifying that bedrock exists 3-feet below the undisturbed ground surface at all investigated alignments.
 3. A DITCH OR STREAM MUST BE CROSSED – A plan and profile showing ditch or stream crossing; horizontal scale 1-inch = 20-feet, vertical scale 1-inch = 2-feet.



504.03 SEPARATION FROM WATERLINES

- 504.03.A** Sanitary sewer systems shall be installed a minimum clear distance of 10-foot horizontally from waterlines and shall be installed to go under such pipes with a minimum of 18-inch of vertical clearance at the crossing of these pipes (in accordance with the requirements of OAR Chapter 333, Public Water Systems (See 333-061-0050)). Deviations shall first be approved by the City Engineer before submittal for approval by State agencies. In all instances the distances shall be measured edge to edge.
- 504.03.B** The basic separation requirements will apply to all gravity and pressure sewers of 24-inch diameter or less. Larger sewers may create special hazards because of flow volumes and joint types, and accordingly require additional separation requirements. The special construction requirements given are for the normal conditions found with sewer and water systems. More stringent requirements may also be necessary in areas of high ground water, unstable soil conditions, or other special site conditions. Any site conditions not conforming to conditions described in this Section will require assessment and approval by the City and appropriate State agencies.
- 504.03.C** Where an individual property is served by a private pump station with a force main discharging to a public sanitary sewer system at the property line, and a domestic water well is also located on that same property, either State of Oregon Plumbing Specialty Code or Oregon Health Authority– Drinking Water Services specified separation of sanitary sewer and waterlines shall apply.

504.04 ACCESS AND UTILITY EASEMENTS

- 504.04.A** When, in the Design Engineer's opinion, it is impractical to locate public utilities in rights-of-way, the utilities shall be placed in an easement, as approved by City Engineer. All public utility easements granted to the City shall be perpetual easements and shall conform to the requirements of Section 102.08.

504.05 RELATION TO WATERCOURSES

- 504.05.A** Generally, the top of all sanitary sewer pipes entering, crossing, or adjacent to streams shall be at a sufficient depth below the natural bottom of the streambed to protect the line. A minimum of 1-foot of cover is required where the sanitary sewer line is in rock; 3-feet of cover is required in other materials.
- 504.05.B** Sanitary sewer lines located along or parallel to streams shall be located outside of the streambed and sufficiently removed therefore to provide for future, possible stream channel widening. All manhole covers at or below the 100-year flood elevation shall be watertight.
- 504.05.C** Sanitary sewer lines crossing streams or drainage channels shall be designed to cross the stream as nearly perpendicular to the stream channel as possible.
- 504.05.D** The pipe material shall be ductile iron in accordance with Subsection 502.03. The specified pipe type shall extend to a theoretical point where a one-to-one slope begins at the top of the bank and slopes down from the bank away from the channel centerline and intersects the top of the pipe.
- 504.05.E** Each deviation from the above requirements will be reviewed by the City Engineer on a case-by-case basis.



505 STRUCTURES

505.01 MANHOLES

505.01.A GENERAL

1. Manholes for mainlines shall be located at all changes in pipe slope, grade, alignment, size, type, and at all pipe junctions with present or future sanitary sewer lines. A manhole shall be placed at the upstream end of each mainline, 7-feet maximum from property line to centerline of manhole.
2. Manhole spacing shall not exceed 400-feet. Deviation from this standard will be considered based on whether or not flushing, cleaning, and closed-circuit television inspection equipment can adequately service the proposed spacing.
3. For ease of maintenance and inspection, manholes shall be installed within the right-of-way of paved public streets. If a manhole must be located outside of the public street right-of-way, access to the manhole shall be provided by means of an easement having a width consistent with Section 102.08. The easement shall be complete with an all-weather driveable surface from the adjacent public street to the manhole. The driveable surface shall extend to a point at least 10-feet beyond the manhole for equipment access.
4. Where practical, manholes shall be located at street intersections and shall be located outside the normal wheel paths. Manhole lids are not permitted within designated existing or future bike lanes. Manholes shall not be placed in curbs or gutters or behind curbs. Manhole lids shall have a minimum of 12-inches of clearance from the edge of a curb and gutter.
5. Manholes located in unimproved areas shall have their lids positioned approximately 1-foot above the surrounding grade and be marked with City approved metal marker post. Manholes located in backyards, side lots, or otherwise substantially outside of the traveled right-of-way, and for public lines in easements within parking lots or other similar traveled areas, or 12 feet or deeper, shall require tamperproof lids. In all areas prone to ponding, flooding, or along stream corridors, and in all areas below the 100-year flood plain, waterproof covers shall be installed. These types of manhole locations should be avoided whenever feasible and practical. Non-standard locations will require review by the City on a case-by-case basis.
6. Two manholes shall be provided for locations where the horizontal angle between the outgoing sanitary sewer and the incoming line will be less than 90 degrees. This is intended to prevent wastewater from discharging into the oncoming flow of an opposing sewer.
7. Where internal system overflows may occur and covers are intended to prevent such overflows, the manhole cone and cover shall be designed to resist the resulting hydrostatic forces and be provided with vent piping. Vent piping configuration and cone and cover restraint will be reviewed by the City on a case-by-case basis.

505.01.B DROP THROUGH MANHOLES

1. Standards for elevation differences at manholes have been established to compensate for normal energy losses and to prevent surcharging of the sanitary sewer system. For purposes of slope calculation and for establishing elevation differences, the elevations are given at the



theoretical horizontal intersection of the sanitary sewer centerlines (usually the center of the manhole). The rules for elevation differences at manholes are:

- a. Where the pipe size decreases upstream through the manhole, the upstream pipe crown shall match the elevation of the crown of the downstream pipe. Where grade is limited, matching 0.8 of the pipe diameters may be used. If the incoming and outgoing pipes are of equal size and are passing straight through the manhole, the invert elevation difference shall be at least 0.10-feet. Manhole channels shall meet the requirements of the Standard Construction Specifications.
 - b. If the pipe alignment changes at the manhole, the invert elevation difference shall be at least 0.10-feet for 0 to 45 degrees of horizontal deflection angle, and 0.20-feet for 45 to 90 degrees of horizontal deflection angle. Horizontal deflection angles of greater than 90 degrees are not allowed. New piping, which is to be connected to existing manholes, shall generally adhere to these same hydraulic considerations. Existing concrete channels within the manhole shall be modified accordingly.
 - c. Outside drop manholes shall be constructed in accordance with the Standard Drawings whenever a vertical separation exists between the inlet and outlet piping that is more than 2-feet. Prior approval by the City Engineer will be required for the use of any inside drop manhole. Outside drop assemblies shall only be used for pipelines 12-inches in diameter and smaller. Larger pipelines shall be introduced into the manhole at the manhole invert. Overall, drop manholes will only be allowed in cases of significant elevation differences between incoming and outgoing lines, or when special conditions exist such as a conflict with existing facilities or utilities that cannot be resolved.
2. Connections must enter the manhole through a channel in the base. This includes drop connections and connections to existing manholes.

505.01.C MANHOLE STANDARD DRAWINGS

1. Manholes shall have a minimum inside diameter of 48-inches and shall be in compliance with the Standard Construction Specifications. Manhole to piping connections shall be made with watertight, flexible manhole/pipe rubber connectors, as shown in the Standard Drawings.
2. The manhole Standard Drawings are suitable for most conditions. New designs or revisions should not be shown on the construction plans unless the Standard Drawings are not suitable. New or revised designs may be necessary if:
 - ❖ One or more of the sewers to be connected to the manhole is over 27-inches in diameter. (smaller diameters may require a special design if the manhole is at an alignment change)
 - ❖ Several sewers will be connected to the manhole.
 - ❖ There is less than 90 degrees between the incoming and outgoing sewer.
 - ❖ The manhole will be subject to unusual structural loads.
 - ❖ Diversion or other flow control measures are required.
3. If a special design is required for any reason, it will be necessary to show that design on the construction plans and to provide the City Engineer with structural calculations if so requested.
4. Some alternate manhole features are shown in the Standard Drawings. Where these features are required, they shall be specified by a note on the construction plans. Some examples are:



- ❖ Slab tops shall be used in lieu of cones where there will be less than 5-feet between the invert of the outlet pipe and the top of the manhole lid.
- ❖ Watertight manhole frames and covers shall be used if floodwaters are expected to cover the manhole top or if the manhole must be located in the street gutter. Such conditions should be avoided wherever feasible.
- ❖ Tamperproof manhole frames and covers are required in all areas outside the paved public right-of-way.

505.02 CONNECTION TO EXISTING SEWERS

505.02.A Connections to, and extensions of, existing sanitary sewer systems will occur to facilitate new development. The connection methods and/or locations shall be carefully reviewed by the Design Engineer and is to be approved by the City Engineer.

505.02.B In general, connections to existing manholes shall be made with the following guidelines:

1. Where the invert of the connecting pipe is 2-feet or less above the invert of the outgoing pipe, the sewage entering the manhole shall follow a smooth concrete channel transitioning evenly from the invert of the inlet pipe into main channel.
2. Where the invert of the connecting pipe is more than 2-feet, the Contractor will be required to construct an outside drop per the Standard Drawings for pipes 12-inches and smaller. Drops for larger pipes will not be allowed. Prior approval by the City Engineer will be required for the use of any inside drop manhole. Sanitary sewer entering the manhole shall follow a smooth concrete channel transition from the bottom of the drop into the main channel.
3. Where the invert is required to enter below the shelf of the manhole, the inlet pipe shall not enter below a point where the crown of the new inlet pipe is below the crown of the outlet pipe. The base of the manhole shall be rebuilt if damaged in this process. The sanitary sewer flow shall enter the main flow in a smooth channel transitioning from the inlet pipe to the main channel.
4. No pipe shall enter an existing manhole where the angle between the incoming flow and the outgoing flow is less than 90 degrees.
5. Where a connection is proposed to an existing manhole, elevation of the existing shelf, location of steps, and elevations of existing inlets and outlets shall be submitted with the plans. Existing manholes which are located within proposed sidewalk areas shall be flush with the finished surface and shall be fitted with standard locking manhole lids.

505.03 MAINLINE CLEANOUTS

505.03.A Cleanouts will not be approved as substitutes for manholes on public sanitary sewer lines. Cleanouts are permitted at the upper end of a sanitary sewer system that is designed to be extended during a phase of construction, as approved by City Engineer. The distance between the cleanout and a manhole is a maximum of 150 feet. The standpipe shall be the same size as the pipeline up to a maximum of 8-inches. If future extension requires a change in pipe slope, alignment, size, or type, a manhole will be required at the cleanout location.

505.03.B Temporary cleanouts may be installed within the right of way at the end of a stub street where the street is expected to be extended in the future and the design of the sewer system does not warrant that a manhole be constructed at this location. The maximum distance of a main line



extension without a temporary cleanout is 15 feet. The City will make the determination when and where temporary cleanouts are allowed. When the sewer is extended, the temporary cleanout shall be removed.

505.04 GREASE INTERCEPTORS

- 505.04.A** Grease interceptors will be required in establishments where, in the opinion of the City Engineer or Public Works Superintendent, grease may be introduced into the drainage of sewage system in quantities that can affect sewer flow, hinder sewage treatment, or private sewage disposal.
- 505.04.B** Establishments that require grease interceptors generally provide foods or beverages for sale or central food preparation as part of its service to residents, customers, or employees. A grease interceptor will not be required for individual dwelling units or for any private living quarters.
- 505.04.C** Grease interceptors shall be designed so that it can be easily cleaned, be properly vented, and shall be sized in accordance with the most current version of the Oregon Plumbing Specialty Code and Standard Drawings. The flow rate through a grease interceptor shall not exceed its rated capacity.
- 505.04.D** Manufactured grease interceptors shall be approved for use in the State of Oregon.



506 SEWER SERVICE LATERALS

- 506.01.A** Sewer service laterals are those public sanitary sewer lines to which a private building sewer connects. Each individual building lot shall typically be connected by a single, separate, private, building-sewer/sewer lateral line connected to the public sanitary sewer system. Individual sewer service laterals shall be located no closer than 10-feet from adjacent property lines (property lines which are perpendicular to public right-of-way). All public service laterals shall extend from the sanitary sewer mainline to the private property line, where a two-way property line cleanout shall be installed. A continuous tracer wire shall be installed from the main to the clean-out of the sewer service lateral at the right-of-way.
- 506.01.B** Sewer service laterals within public right-of-way shall conform to public works standards. Sewer service laterals outside of public right-of-way shall conform to State and local plumbing codes. No roof runoff, foundation drain, or stormwater line of any kind shall be connected to sewer service laterals. Laterals, which serve individual single-family residences or equivalent dwellings, shall be 4-inches in diameter. Multi-family dwellings or commercial buildings shall have 6-inch laterals. No 4-inch or 6-inch sewer service lateral from adjacent private property will be allowed to be connected directly to a manhole.
- 506.01.C** Sewer service laterals shall be built to the same standards and of the same materials as the sanitary sewer main line. In general, sewer service laterals shall be placed at 90 degrees to the sanitary sewer main line to avoid excessive exposure to other utilities during excavation for construction or maintenance of the sewer service laterals. Angles other than 90 degrees (45 degrees minimum) may be approved by the City Engineer for cul-de-sac lots.
- 506.01.D** The minimum slope of sewer service laterals shall be 2 percent; except that for unusual conditions, a slope of 1 percent may be approved by the City Engineer. The Design Engineer will be required to provide a complete analysis of the need for any sewer service lateral slope less than 2 percent. Depth of public sewer service laterals shall be in accordance with Section 504.02.B.
- 506.01.E** The following additional requirements apply to public service laterals:
1. An existing service must be televised and inspected prior to use, unless otherwise approved by the City Engineer.
 2. Sewer service laterals shall be connected to sewer mains using approved manufactured fittings.
 3. For existing homes without sanitary sewer service or for vacant lots, new public sewer service laterals shall be provided as part of new development projects or other street rehabilitation/utility projects.
 4. The length of sewer service laterals shall generally be limited to 100-feet. Cleanouts shall be installed every 100-feet if longer sewer service laterals are allowed. Where one or more sewer service laterals will exceed 100-feet in length in order to serve the adjacent private property, a public main and manhole may be required and located within an easement, as approved by the City Engineer.
 5. Backwater check valves and isolation gate valves are required for all buildings where potential flooding exists if the public sanitary sewer system were to backup. These valves shall be private valves installed as part of the private sewer service piping.



507 PRIVATE SEWER SYSTEMS AND PRIVATE BUILDING SEWERS

- 507.01.A** Private sewer systems and private building sewers shall be installed on private property in accordance with the requirements of the State of Oregon Plumbing Specialty Code.
- 507.01.B** Easements for private sewer systems and private building sewers are the responsibility of the property owners; but copies of the recorded easements must be given to the City Engineer prior to any construction.
- 507.01.C** Private sewer systems and private building sewers will not be permitted within the public right-of-way.
- 507.01.D** Private sewer systems and private building sewers shall be connected to the public sewer system at a two-way property line cleanout for gravity single family and multi-family residences and a standard manhole within the public right-of-way or easement for all other private sewer connections, unless approved otherwise by City Engineer. All sewers in the public right-of-way must be gravity flow. Immediately upstream of the connecting manhole at the property line, a separate monitoring manhole will be required. The monitoring manhole shall be as shown in the Standard Drawings.



508 PUMP STATIONS

508.01 GENERAL

508.01.A Pump stations will not be allowed if other options exist for gravity sewer flow. If allowed by the City, pump stations must be consistent with the approved Wastewater Master Plan and approved by City Engineer.

508.01.B Pump stations shall be a submersible pump-type facility and shall meet or exceed the minimum requirements of the Oregon Department of Environmental Quality (DEQ) as established in the Oregon Administrative Rules, Chapter 340, Division 52, and as presented in the DEQ publication "Oregon Standards for Design and Construction of Wastewater Pump Station." Where conflicts exist between the Design Standards and the aforementioned documents, or any other technical specifications identified therein, the most stringent requirements shall take precedence.

508.01.C PUMP STATION FACILITY

1. The pump station facility shall include, but not be limited to the following:
 - ❖ Submersible pumps
 - ❖ Wet Well
 - ❖ Valve Vault
 - ❖ Bypass pump out connection
 - ❖ Associated Piping and Valves
 - ❖ Electrical Controls
 - ❖ Instrumentation
 - ❖ Telemetry to City system.
 - ❖ Access Road and Parking Area
 - ❖ Fencing, Landscaping
 - ❖ Potable Water Supply
 - ❖ Backup Generator w/ noise silencer, if required
 - ❖ Others, as deemed appropriate by the City

508.01.D PUMP STATION CAPACITY

1. Pump station shall be designed to pump the peak wastewater flow from the service area. When the service area is not built-out, staging of pump station capacity may be allowed.

508.01.E STANDBY POWER

1. All sewage pump stations shall be designed with capability for emergency power in case the primary electrical feed is out of service. Unless approved otherwise by the City Engineer, all pump stations shall have a permanent engine generator unit with automatic transfer switches to transfer the electrical feed from the primary to the standby unit when a power failure is detected by the instrumentation and control system.
2. Determining the engine generator's size depends upon the requirements of starting and operating the pumps at peak possible load and all ancillary equipment in the sewage pump station that could operate during a power outage. All sizing shall be coordinated with the manufacturer.



508.01.F LOCATION

1. The pump station facility shall be easily accessible and shall be vertically located at least 2-feet above base flood elevation. Pump station shall comply with the distance and utility separation requirements in accordance with DEQ guidelines.

508.02 DESIGN CRITERIA

508.02.A CALCULATIONS

1. Service area, peak flow, and other pump station calculations shall be submitted to the City Engineer and DEQ for review and approval within a pre-design study in accordance with DEQ requirements.

508.02.B STORAGE VOLUME

1. The wet well shall be designed to provide 4-hours of wastewater inflow storage, per Subsection 503.02, above high water alarm elevation.

508.02.C SUBMERSIBLE PUMPS

1. A minimum of two (2) submersible pumps shall be supplied. Each pump shall be capable of pumping the peak wastewater flow. Where more than two (2) pumps are used, the station shall be able to pump peak wastewater flow when the largest pump is out of service.
2. Pumps shall be submersible pumps manufactured by FLYGT (or approved equal), explosion-proof, suitable for hazardous location, capable of passing solids and shall be UL or FM listed.
3. Pumps shall be readily removable and replaceable without dewatering the wet-well or requiring personnel to enter the wet-well. Check valves and isolation valves shall be mounted outside the wet-well to facilitate access and contained in a structure suitable for protection against vandalism.
4. Control panels shall be physically separated from the wet-well, meet the requirements of the NEC, NFPA, and be suitably protected from the weather, humidity, and vandalism. The pumps shall be explosion-proof unless the control system can provide adequate assurance that pump motors in operation are submerged at all times. Electrical junction boxes shall be easily accessible without entering the wet-well.

508.02.D PIPING AND VALVES

1. All pump stations shall be provided with a valve vault for valves, piping, air and vacuum relief valves, and surge control components. Each pump discharge shall include a check valve, an isolation valve, and pressure gauge.
2. Sewage pump stations that discharge into long force mains in which there is high likelihood of grease buildup or where the force main will have low velocities, shall be equipped with valves, piping, and end cap for launching of a pig to remove buildups of undesirable materials in the force main. See Section 508.02.J.11. Also, long force mains shall be designed to control hydrogen sulfide and other hazardous gases.



508.02.E ELECTRICAL

1. Electrical controls shall be located above ground mounted in a waterproof enclosure and should be oriented facing away from prevailing weather. Electrical panels shall be UL listed. The pump station wet well shall be considered a hazardous location.

508.02.F CONTROLS

1. Pump stations shall utilize a PLC-based control system.
2. An ultrasonic level transducer shall control pump operation and alarms.
3. A redundant float activated circuit shall provide a fail-safe, high-water alarm system. The brand and model of the programmable logic controller, as well as other devices, should be obtained from the Public Works Superintendent in order to ensure compatibility with the existing system.
4. Control system design shall be subject to the approval of the City Engineer.

508.02.G ALARMS AND TELEMETRY

1. Alarms shall be telemetered to the City of Stayton Wastewater Treatment Plant. Telemetry shall conform to specifications and requirements provided by the Public Works Superintendent to ensure compatibility with existing systems. Required alarms include:
 - ❖ High water
 - ❖ Low water
 - ❖ Power failure
 - ❖ Pump failure
 - ❖ Telemetry failure
 - ❖ Others, as required by City

508.02.H LANDSCAPING AND FENCING

1. Landscaping and fencing shall be in accordance with the Stayton Municipal Code, DEQ requirements, and as required by the City Engineer.

508.02.I ADDITIONAL FEATURES

1. Provide 1-inch hose bib at valve vault. Potable water shall be provided by reduced pressure backflow preventer.
2. Provide positive ventilation in valve vault.
3. Provide odor control systems as required by DEQ and the City Engineer.
4. Provide analysis to determine if hydrogen sulfide or other hazardous gas control system is required and provide as necessary.



508.02.J FORCE MAINS

1. SIZE

- a. Except for small grinder and effluent pump installations, piping for force mains shall not be less than four inches in diameter. Force main headloss will determine pipe diameter; however, as a general rule, whenever the velocity exceeds 8 fps, a larger pipe shall be used.

2. VELOCITY

- a. At pumping capacity, a minimum self-scouring velocity of 2 fps shall be maintained unless flushing facilities are provided. Velocity shall not exceed 8 fps. Optimum velocities for reducing maintenance costs and preventing accumulation of solids range between 3.5 and 5 fps.

3. AIR RELIEF AND VACUUM VALVES

- a. An air relief and/or vacuum valves shall be placed at high points in the force main to relieve air locking or supply adequate air during vacuum scenarios. The surge effect on the system shall be considered when sizing these valves.
- b. Air relief and vacuum valves shall not be in combination. Separate valving is required and shall be equipped with isolation valves, be located directly above the force main, and designed with a cleanout or flushing attachments to facilitate maintenance. These valves shall be protected from freezing and from damage by heavy equipment.

4. BLOW-OFFS

- a. A blow-off shall be installed at low points of force mains where gritty material can accumulate and restrict flow.

5. TERMINATION

- a. The force main shall be aligned to enter the receiving manhole with its centerline horizontal to the outlet piping and at an invert elevation that will ensure a smooth transition of flow to the gravity flow section. In no case however, shall the force main enter the gravity system at a point more than 1-foot above the flow line of the receiving manhole. The design shall minimize turbulence at the point of discharge.
- b. Consideration shall be given to the use of inert materials or protective coatings for the receiving manhole to prevent deterioration from hydrogen sulfide or other chemicals.

6. CONSTRUCTION MATERIALS

- a. Materials to be considered for force mains shall include ductile iron, steel, polyethylene, polyvinyl chloride (PVC), and pre-stressed and reinforced concrete. The pipe material and interior lining shall be selected to adapt to local conditions, including industrial waste and soil characteristics, exceptionally heavy external loading, internal erosion, corrosion, and similar problems. The system design and surge allowances may preclude the use of some materials.



- b. Installation specifications shall contain appropriate requirements based on the criteria, standards, and requirements established by the industry in its technical publications. Requirements shall be set forth in the specifications for the pipe and methods of backfilling to preclude damage to the pipe or its joints, impede future cleaning operations, prevent excessive side pressures that may create deformation of the pipe, or seriously impair flow capacity.
- c. All pipes shall be designed to prevent damage from superimposed loads. Proper allowance for loads imposed on the pipe shall be calculated for the width and depth of the trench.

7. PRESSURE TESTS

- a. All force mains shall be hydrostatically tested at a minimum pressure of at least 1.5 times above the design working pressure. Leakage shall not exceed the amount given in the following formula:

$$L = (ND\sqrt{P}) / 7400$$

- L = allowable leakage, gallons per hour
- N = number of joints in length of pipeline tested
- D = nominal diameter of the pipe in inches
- P = average test pressure during the leakage test (psig)

8. CONNECTIONS

- a. In order to avoid shearing force main pipes because of differential settlement, flex couplings shall be used on force main pipes between the pump station structures, such as the pump station and the valve box. Flex couplings shall also be used between the final pump station structure and the force main.

9. SURGE CONTROL

- a. Hydraulic surges and transients (water hammer) are dependent on a force main's size, length, profile, construction materials, and pump operating pressure. Pipe pressure tests and thrust restraint shall be based on maximum transient conditions, including an appropriate margin for safety.

10. THRUST RESTRAINT

- a. Thrust forces in pressurized pipelines shall be restrained or anchored to prevent excessive movement and joint separation under all projected conditions. Common methods include internal axial restraint.

11. PIG LAUNCHING/RETRIEVAL FACILITIES

- a. When required, pig launchers shall be provided and special care shall be given to designing the force main terminus to include a pig catcher and the ability to remove materials driven out of the force main by the pig.
- b. Pig launchers shall include proper valving so that a pig launcher can be isolated from the force main. After the pig is inserted into the line, the valves are adjusted to drive the pig through the force main using the force of the pumps. Additional water may be added to the wet-well to decrease the travel time in the force main.
- c. Pig launching facilities shall include a launch chamber, bypass piping, valves, and gauges to monitor pressure.



- d. Retrieval facilities shall be mirror images of the launch device. Baskets, traps, or screens placed in the receiving manhole for retrieval methods shall be as approved by City Engineer.

508.02.K FABRICATED STEEL SURFACE FINISH

1. Steel fabrications shall be 304 stainless steel or hot dipped galvanized. Corrosion resistant painting shall be required on valves, piping, and pipe fittings or other items that cannot be hot dipped galvanized.

508.02.L CODE AUTHORITY

1. Pump station and related facilities will be constructed in conformance with applicable Electrical, Building, and Fire Codes.

508.02.M OPERATING AND MAINTENANCE DATA

1. An operation and maintenance (O&M) manual including all product data and related information necessary for the City's operation and maintenance of all products and systems provided with the pump station shall be provided.
2. During the design of sewer pump stations, consideration shall be given to operations and maintenance (O&M) needs. The O&M manual shall include provisions for:
 - ❖ Detailed descriptions of all operating processes and procedures.
 - ❖ Design data for pumps, motors, force main, standby power, overflow point and elevation, telemetry, and sulfide control system, as applicable.
 - ❖ Pump curve with computed system curve showing design operating point.
 - ❖ Startup and shutdown procedures (step by step instructions).
 - ❖ Analysis of critical safety issues.
 - ❖ Inventory of critical components, including nameplate data for pumps and motors, etc.
 - ❖ Description of the maintenance management system, including preventive and predictive maintenance.
 - ❖ Vulnerability analysis.
 - ❖ Contingency plan, including redundancy considerations.
 - ❖ List of affected agencies and utilities, including after-hour contacts.
 - ❖ List of local contractors for emergency repairs, including after-hours contacts.
 - ❖ List of vendors and manufacturers of critical system components, including after-hour contacts.
 - ❖ Staff training plan.
 - ❖ Stand-by generator exercising and operation instructions.
 - ❖ As-Built Drawings. All construction changes and location of underground pipe, conduit, buried facilities, shall be recorded by the contractor and be made part of the record drawings.
3. The O&M manual shall conform to the guidelines as set forth in the Oregon DEQ publication "Guidelines for Writing Pump Station O&M Manuals".
4. All O&M information and manufacturer's cut sheets shall be originals. Copies will not be accepted. Provide a minimum of 5 originals.

508.02.N SPARE PARTS OR TOOLS

1. Supply two (2) sets each of all gaskets, bearings, mechanical seals for rotating equipment, and other spare parts or special tools as deemed appropriate by the Public Works Superintendent.



509 TRENCHLESS TECHNOLOGIES

509.01 GENERAL

- 509.01.A** Trenchless techniques for new construction include: micro-tunneling or directional boring, auguring or boring, pipe jacking, and other mining type operations. Costs, topography, or other issues that may preclude traditional open cut and excavation methods will most often direct the use of these techniques.
- 509.01.B** The trenchless technologies are available for sewer system rehabilitation/replacement to preserve structural integrity and reduce Infiltration/Inflow. There are a number of products available from a variety of manufacturers and Contractors to help meet these objectives.
- 509.01.C** Design Engineers shall take care to verify that a certain class of product is suited for its proposed application and that a specific product and its installer meet appropriate standards, including successful performance history. The purpose of this section is to highlight the advantages, disadvantages, and other issues for the various classes of sewer rehabilitation/replacement products.
- 509.01.D** The following rehabilitation/replacement techniques that are approved to use for sewers within the City are discussed in the following Tables.

Sliplining		
Sliplining is a trenchless rehabilitation. Sliplining is the insertion of a new pipe, either continuous (typically butt-fused HDPE) or segmented (typically PVC, ductile iron, or HDPE), of smaller diameter into an existing pipe.		
Advantages	Disadvantages	Issues
<ul style="list-style-type: none"> • Economical. • Strong. • Bypass pumping of sewage may not be needed (for segmented slipliner pipe). 	<ul style="list-style-type: none"> • Hydraulic capacity reduced. • Entry pits usually required. • Service lateral connections must be excavated. 	<ul style="list-style-type: none"> • Flotation of liner must be prevented during grouting of annular space. • Condition of existing pipe may limit length of slipliner runs between pits, diameter of slipliner pipe, and/or lengths of segmented pipe pieces.



Cured-in-place Pipe (CIPP)		
<p>CIPP is a trenchless rehabilitation. The CIPP lining process consists of inverting a resin impregnated flexible tube into an existing pipe using hydrostatic head or air pressure. The resin is cured using heat.</p>		
Advantages	Disadvantages	Issues
<ul style="list-style-type: none"> • No access pits. • Service laterals can be internally reopened. • Minimal annular space. • Suitable for various cross sectional shapes. • Strength can be selected as a function of liner thickness and resin formula. • Manholes can be rehabilitated rather than replaced. 	<ul style="list-style-type: none"> • Bypass pumping of sewage is required. • Limited local competition. 	<ul style="list-style-type: none"> • Liner wet-out with resin must be ensured. • Resin pot life must not be exceeded. • Proper curing temperatures and times must be maintained. • I/I must be controlled during installation. • Expertise and performance of manufacturer and installer must be ensured.

Pipe Bursting		
<p>Pipe bursting is a trenchless replacement. Through pipe bursting, the existing pipeline is fragmented and forced into the surrounding soil by pulling a bursting head through the line. A new pipe (typically butt-fused HDPE) of equal or larger diameter is pulled behind the bursting head. New manholes are usually provided at insertion and withdrawal pits.</p>		
Advantages	Disadvantages	Issues
<ul style="list-style-type: none"> • Creates a new, strong pipeline, not just rehabilitation of existing pipes. • Capacity can be increased. • Preparation of existing line is not critical. 	<ul style="list-style-type: none"> • Entry pits are required. • Service lateral connections must be excavated. • Bypass pumping of sewage required. • Manholes usually must be replaced. 	<ul style="list-style-type: none"> • Condition and location of adjacent buried utilities and foundations as well as surface improvements, should be considered • Dense or rocky soil may limit suitability of this method.



Point Repairs		
<p>Point repairs can structurally rehabilitate and eliminate infiltration in short sections of lines by such methods as short CIPP liners, epoxy resins, and structural grouting sleeves. Defects such as protruding laterals can be repaired by robotic grinding. Point repairs may be needed to properly prepare the line for some of the manhole to- manhole rehabilitation/replacement options described in the techniques listed above.</p>		
Advantages	Disadvantages	Issues
<ul style="list-style-type: none"> • Economical. • Repairs only what is needed. 	<ul style="list-style-type: none"> • May not be appropriate for old lines if many more repairs may be needed in near future. 	<ul style="list-style-type: none"> • Goals of project must be considered, along with cost estimates, to ensure manhole-to manhole rehabilitation and replacement is not warranted.

509.01.E Other rehabilitation/replacement techniques including Fold and Form (PVC and HDPE), Spiral Wound PVC, fiberglass linings, cement mortar lining, sprayed coatings, and others will be reviewed and considered on a case-by-case basis, and will only be allowed in certain applications at the approval of the City Engineer.

509.02 PRIVATE SEWER SERVICE LATERAL REPAIRS

509.02.A Private sewer service laterals are sewer lines that connect building sewers on private property to the public sewer main in the public right-of-way or easements.

509.02.B Research studies by EPA and others indicate that a significant percentage of system-wide I/I is caused by private property sources. These include sump pumps, foundation drains, roof drains, and defects in service laterals. Service lateral defects include cracked, broken, or open jointed laterals. In addition, infiltration frequently occurs at a leaky connection of the lateral to the sewer main.

509.02.C Repair of service lateral defects can be accomplished using many of the same methods listed above for sewer mains. Chemical grouting, CIPP lining, and pipe bursting, in addition to open cut excavation and replacement shall be considered for repair of service laterals, where required.

509.02.D In cases where sewage backups have occurred through service laterals and into buildings, installation of backwater valves provides an immediate solution until the longer term sewer system rehabilitation/replacement program shows results. Backwater valves are typically installed beneath basement floor slabs on that portion of the building drain serving the basement only. This allows plumbing fixtures on the main floor and above to drain even during times when the sewer main is surcharged.

509.03 MANHOLE REHABILITATION

509.03.A Manhole rehabilitation can be performed to correct structural deficiencies, address maintenance concerns, and/or eliminate I/I. Manhole rehabilitation options which shall be considered when required include lining, sealing, grouting, or replacing various components or



the entire manhole. The rehabilitation method selected depends on whether inflow or infiltration, or both, is to be eliminated and whether structural integrity is an issue. Inflow typically occurs through holes in the manhole cover or around the manhole frame and cover.

509.03.B When inflow occurs or is likely to occur, manhole covers shall be sealed by replacing them entirely with new watertight covers with rubber covered gaskets, rubber vents, and pick hole plugs, or by installing watertight inserts under the existing manhole covers (inflow protectors). Inflow protectors shall contain vacuum and gas release valves.

509.03.C Chemical grouting shall be considered as a method to eliminate infiltration.

END OF DIVISION

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DIVISION 6

STORMWATER MANAGEMENT

601 GENERAL

601.01 AUTHORITY AND PURPOSE

- 601.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City. Most of the elements contained in these Design Standards are public works oriented and it is intended that they apply to both publicly financed public improvements under City contract and privately financed public improvements.
- 601.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects that ultimately will be owned, operated, or maintained by the City shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 601.01.C** The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of public improvements shall be implemented. All public system improvements and public works facilities shall be designed and constructed in accordance with applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals, and in accordance with applicable federal, state, and local statutes and rules. Approval of public improvements must be made by the City Engineer or the Public Works Director before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- 601.01.D** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every public improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 601.01.E** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.
- 601.01.F** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such variance will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.



- 601.01.G** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. Request must show that the variance meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All requests will be in writing and be accompanied by engineered drawings and final design calculations.
- 601.01.H** All franchise utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City Standards.
- 601.01.I** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.
- 601.01.J** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 601.01.K** On completion of projects to become public works, the Design Engineer shall submit one complete set of reproducible "Record Drawings" (As-Builts), a digital file containing electronic PDFs and cad files (AutoCAD, or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification.
- 601.01.L** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 601.01.M** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.
- 601.01.N** The objective of these Design Standards is to provide for a stormwater system that will:
- ❖ Safely manage stormwater runoff that is generated upstream and on the site from given storm intervals to an approved discharge point.
 - ❖ Prevent the uncontrolled or irresponsible discharge of stormwater onto adjoining public or private property in order to prevent the capacity of downstream stormwater systems from being exceeded.
 - ❖ Maintain the stormwater runoff characteristics of the original undeveloped drainage basin, where feasible.
 - ❖ Maintain or improve Stayton's overall stormwater quality, incorporate best management practices, and maximize efficient use of Stayton's natural drainage systems.
 - ❖ Be designed to be economical and safe to maintain with materials that have sufficient structural strength to withstand expected external design loads to ensure a practical design life of seventy-five (75) years.
 - ❖ Be consistent with the Stayton Municipal Code (SMC), Stayton Standard Construction Specifications and applicable state and federal regulations and requirements for stormwater quantity and quality.



601.02 APPLICABILITY

601.02.A These Design Standards shall govern the design for the construction and upgrading of all public improvements, privately financed public improvements, and other applicable work within the City and its service areas. This document will be routinely referred to as the Design Standards. Permanent storm drainage and stormwater management facilities shall be provided on all property improvements within the City per these Design Standards for all types of development, including:

1. Partitions and subdivisions.
2. Commercial, industrial, multifamily, residential, and infill lot developments. These Design Standards are intended to fulfill the requirements of the "Special Storm Sewers" section of the State of Oregon Plumbing Specialty Code for private storm drains.
3. Developments entailing construction that would change the point of discharge of surface waters, the quantity of discharge, or discharge surface waters at a higher velocity or flow than that of the preconstruction discharge rate or add to pollution of surface waters.
4. Construction or reconstruction of public roadways and temporary detours.
5. Developments entailing construction in or adjacent to any existing stream or surface watercourse including intermittent streams.
6. Developments requiring construction in or adjacent to the 100-year floodplain.

601.03 REFERENCES

601.03.A These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Subsection 101.03 and others specifically listed below. Projects are expected to be consistent with the following:

1. Applicable concepts consistent with the most recent Stormwater Master Plan adopted by the City of Stayton. Where additional detailed information and background is required for a particular project, the Stormwater Master Plan shall be referred and adhered to, as applicable. Any deviations from the Stormwater Master Plan shall be flagged and presented to the City Engineer for consideration.
2. State of Oregon Plumbing Specialty Code.
3. Applicable design guidelines published by the American Society of Civil Engineers.
4. Applicable design guidelines published by the Federal Highway Administration.
5. Applicable design guidelines published by the Oregon Department of Transportation.
6. Applicable stormwater and erosion control design manuals including, but not limited to, the following.
 - ❖ City of Portland Stormwater Management Manual
 - ❖ ODOT Hydraulics Manual
 - ❖ FHWA Hydraulic Engineering Circular No. 22
 - ❖ City of Portland Erosion and Sediment Control Manual
 - ❖ ODOT Erosion Control Manual
 - ❖ Oregon DEQ's Erosion and Sediment Control Manual



601.04 SPECIAL DESIGN APPLICATIONS

601.04.A Special design applications not covered in these Design Standards require review and approval by the City. Submittal of full design calculations, supplemental drawings, and information will be required prior to any approval.

601.04.B Such design applications requiring special review and approval include, but are not limited to, the following:

- ❖ Pump Stations and Force Mains
- ❖ Electrical/Monitoring/Telemetry Devices
- ❖ Siphons
- ❖ Internal Sealing of Existing Storm Drains
- ❖ Relining of Existing Storm Drains
- ❖ Energy Dissipaters
- ❖ Bank Protection

601.05 STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS

601.05.A Except as otherwise provided by these Design Standards, all construction design detail, workmanship, and materials shall be in accordance with the current edition of the City of Stayton Public Works Standard Construction Specifications and Standard Drawings.

601.06 CITY POLICY REGARDING ENGINEERING

601.06.A It will be the policy of the City to require compliance with Oregon Revised Statute 672 for Professional Engineers.

601.06.B Engineering plans, reports, or documents shall be prepared by a registered Professional Engineer or by a subordinate employee under the Design Engineer's direction and shall be signed by the Design Engineer and stamped with the Design Engineer's seal to indicate responsibility for them. The Design Engineer shall maintain complete responsibility for the design of the project. The Design Engineer shall review any proposed public facility extension, modification, or other change with the City prior to engineering or other proposed design work to determine if there are any special requirements or whether the proposal is permissible.

601.06.C City approval of plans or any other engineering document produced by the Design Engineer does not in any way relieve the Design Engineer of responsibility for the design, or their responsibility to meet applicable City, County, State, and Federal requirements, or their obligation to protect life, health, and property of the public. The plan for any project shall be revised or supplemented at any time it is determined that the project requirements have not been met. It is also required that at any time a revision to the design is required, the Design Engineer shall maintain responsibility to redesign according to these Design Standards per the City's approval. It is therefore necessary for the Design Engineer to be available during construction should timely changes be required. If the Engineer of Record leaves the acting consulting firm then a new registered engineer will have to submit an updated Engineer of Record form to the City prior to work commencing.

601.07 CONVENTIONS USED THROUGHOUT THE DESIGN STANDARDS

601.07.A See Subsection 101.07 for conventions used throughout these Design Standards.



601.08 ORGANIZATION AND CLASSIFICATION OF DIVISIONS

601.08.A See Subsection 101.08 for the organization and classification of divisions throughout these Design Standards.

601.09 CLARIFICATIONS, MODIFICATIONS, AND REVISIONS TO DESIGN STANDARDS

601.09.A These Design Standards will be periodically updated due to changes in policy or procedures, new technology, and methods of design and construction. Periodic revisions to these Design Standards will be necessary to maintain consistency in that regard. The date appearing on the title page is the date of the latest revision for each Division. Parenthetical notations at the bottom of each page indicate the most recent change. It will be the user's responsibility to obtain and maintain his/her copy of these Design Standards with the latest changes.

601.09.B See Subsection 101.09 for general policies and procedures regarding clarifications, modifications, and revisions to the Design Standards.

601.10 DEFINITIONS AND TERMS

601.10.A See Subsection 101.10 for standard definitions and terms used throughout these Design Standards.



602 GENERAL DESIGN REQUIREMENTS

602.01 PERFORMANCE STANDARDS

- 602.01.A** Storm drainage design shall meet the policies and guidelines of the latest Stormwater Master Plan and its updates. All stormwater that is or will be discharged to the City system shall comply with the Stayton Municipal Code requirements.
- 602.01.B** Stormwater and groundwater, including but not limited to, street, roof, or footing drainage, shall not be connected to, or will be allowed to discharge into, any sanitary sewer system.
- 602.01.C** For any project requiring construction within or adjacent to watercourses and/or wetlands, in addition to approval by the City, permits from the appropriate responsible agencies (Oregon Department of Fish and Wildlife, Oregon Division of State Lands, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, etc.) shall be obtained. Copies of all permits, or written evidence that no permit is required shall be given to the City prior to City approval of the construction plans.
- 602.01.D** Storm drainage design within a development area shall include provisions to adequately control runoff from all public and private streets and the roof, footing, and area drains of residential, multifamily, commercial, industrial, or public buildings, and to ensure future extension of the drainage system to the entire drainage basin in conformance with the Stayton Municipal Code and adopted Stormwater Master Plan.
- 602.01.E** Storm drain system designs (conveyance, flow restrictions, detention) shall make adequate provisions for collecting all stormwater runoff. The system shall accommodate all runoff from upstream tributary areas whether or not such areas are within the proposed development. The amount of runoff to be accommodated shall be based upon ultimate development of all upstream tributary areas. Proposed storm drain systems shall not discharge flows into inadequate downstream systems.
- 602.01.F** Calculations for storm drain design shall be submitted with all storm drain improvement projects. Calculations shall clearly show how flows were calculated and also how the proposed storm drain system is capable of conveying these flows. For projects that require stormwater quality and/or quantity facilities, additional design calculations shall be submitted. See Subsection 603.01 for Drainage Report submittal requirements.
- 602.01.G** Connections to downstream stormwater systems (including roof drain connections) will not be allowed if a capacity issue exists or may exist after the connection is made, as identified through flood complaint calls, operational knowledge, or from the Stormwater Master Plan. The Developer will be required to perform an analysis of the downstream stormwater system per Subsection 603.01.B and make the needed capacity improvements or provide other means to mitigate the downstream impacts, and/or provide additional on-site detention/retention if capacity issues exist or may exist. This applies to all types of development in which a permit is required.
- 602.01.H** Surface or subsurface drainage, caused or affected by the changing of the natural grade of the existing ground or removal of natural ground cover or placement of impervious surfaces, shall not be allowed to flow over adjacent public or private property in a location materially different from that which existed before development occurred, but shall be collected and conveyed in an approved manner to an approved point of disposal. Requirements of Building Codes shall also be met regarding alteration of drainage patterns.



- 602.01.I Surface water entering the subject property shall be received at the naturally occurring locations and surface water exiting the subject property shall be discharged at the natural locations with adequate energy dissipators within the subject property to minimize downstream damage and with no diversion at these discharge points.
- 602.01.J The approved point of discharge for all stormwater may be a storm drain, existing open channel, creek, detention, or retention facility approved by the City Engineer, or subsurface as allowed and approved by DEQ. Acceptance of suggested systems will depend upon the prevailing site conditions, capacity of existing downstream facilities, and feasibility/maintainability of the alternate design.
- 602.01.K All public storm drain systems shall be located within the public right-of-way or as directed and approved by the City Engineer. These storm drain systems are placed in the public right-of-way for ease of maintenance and access, control of the facility, operation of the facility, and to permit required replacement and/or repair. The City Engineer, under special conditions, may allow a public storm drain system to be located within a public storm drain easement as referenced in Subsection 102.08. When private property must be crossed in order to reach an approved point of discharge, it shall be the Developer's responsibility to acquire a recorded easement from the private property owner meeting the approval of the City Engineer. The Developer must secure all signed easement documents from private property owners prior to final plan approval.
- 602.01.L An erosion and sediment control plan shall be developed for all phases of the project construction to protect downstream waters and minimize erosion. Stormwater quality enhancements are encouraged and stormwater quality Best Management Practices (BMPs) shall be incorporated into the design.
- 602.01.M All other local, State, and Federal permitting requirements must be met. The Developer shall produce copies of approved permits for the City prior to final plan approval.
- 602.01.N Stormwater quality and quantity provisions shall be included as part of the design considerations. The City of Stayton's thresholds for proposals that are subject to the stormwater quality and quantity requirements are identified below. Unless otherwise specifically approved by the City Engineer, proposals meeting these thresholds must comply with the stormwater quality (pollution reduction) requirements specified in Section 607, the stormwater quantity (flow control) requirements specified in Section 608, and the stormwater infiltration requirements specified in Section 609. All projects shall comply with the City's stormwater operations and maintenance (O&M) plan and agreement requirements and source control requirements.
1. **Stormwater Quality (Pollution Reduction):** Development and any other activities which create new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, are required to construct or fund permanent stormwater quality facilities to reduce contaminants entering the storm and surface water system. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quality requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible before discharging any flows offsite.
 - a. Some site characteristics and uses may generate specific pollutants of concern or levels of pollution that are not addressed solely through implementation of the pollution reduction requirements in Section 607. The *City of Portland Stormwater Management Manual* (SWMM) defines these characteristics and uses and identifies structural source controls that must be implemented to manage the pollutants at their source (see SWMM Chapter 4, Source Controls). The City of Stayton requires that **any project of any size** that



introduces these site characteristics or uses must comply with the SWMM source control requirements. This includes development, tenant improvements, and changes to site uses or activities, including changes to specific site or activity areas, even if no impervious area is added or replaced.

2. **Stormwater Quantity (Flow Control):** Development and any other activities which create new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, shall incorporate stormwater quantity facilities for mitigating its impacts on the public stormwater systems and receiving water bodies. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quantity requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible before discharging any flows offsite.
 - a. Unless directed otherwise, stormwater quantity facilities will be required to detain post-developed peak runoff rates from the 2-year, 5-year, 10-year, 50-year, and 100-year 24-hour storm events to the respective pre-developed peak runoff rates and the post-developed peak runoff rate for the 25-year storm event will be required to be detained to the 10-year pre-developed peak runoff rate (required release rates). Potential downstream damage due to stormwater quantity facility system failure/overflow may require greater detention requirements or improvements downstream as further indicated in section 603.01.B. In no case shall the required release rates increase the flooding conditions downstream.
3. **Stormwater Infiltration:** Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite. Maximum extent feasible is defined as the extent to which a requirement or standard must be complied with as constrained by the physical limitations of the site, practical considerations of engineering design, and reasonable considerations of financial costs and environmental impacts. The appropriate use of stormwater surface infiltration depends on a number of factors, including soil type, soil conditions, slopes, and depth to groundwater. The point of discharge is also site specific and dependent on the availability and condition of public and private infrastructure. The feasibility of surface infiltration and the discharge point have a direct impact on the stormwater quality and quantity requirements for a site; therefore, it is critical to determine the feasibility of surface infiltration and the point of discharge before designing a stormwater facility.

602.01.O These stormwater quality and quantity requirements are minimum standards. If the City determines that additional controls are necessary in basins that drain to sensitive receiving waters or groundwater sources (such as defined by the DEQ's 303d, and proposed Total Maximum Daily Load (TMDL) requirements for water-quality limited streams, the DEQ's Underground Injection Control Regulations, or Federally designated threatened and endangered fish listings), additional facilities, treatments, or other best management practices (BMP's) may be required. These requirements could include larger facility designs as well as additional types of stormwater quality and quantity controls.

602.01.P Stormwater management facility designs within the City of Stayton shall comply with the most current edition of the *City of Portland Stormwater Management Manual (SWMM)*, except as specifically **excluded or** modified by these Design Standards, or as specifically approved by the City Engineer. **The City of Portland SWMM facility designs that are not allowed are:**

- ❖ Ecoroofs;
- ❖ Tree Credits;
- ❖ Drywells; and
- ❖ Sumps



The City of Portland SWMM facility designs that are not allowed unless specifically approved by the City Engineer on a case-by-case basis are:

- ❖ Pervious Pavements;
- ❖ Soakage Trenches;

602.01.Q The *City of Portland SWMM* provides guidance for selection and basic design considerations of various stormwater management facilities. The guidelines are not intended to be a comprehensive list of all stormwater management facilities but provide a general overview of those commonly used. In selecting the appropriate stormwater management facility for a site, the designer must consider the site characteristics, anticipated land uses, runoff characteristics, and treatment objectives. The use of any other resource shall be coordinated with and approved by the City Engineer prior to design.

602.01.R The City of Stayton administers the development review process, including land use reviews, as well as building permits for private improvements. The City also reviews, approves, and inspects stormwater facilities on private property as part of the development permitting process. Public works improvement permits are required for public infrastructure improvements, which are generally located in the public right-of-way. See Subsection 103.02 for more information on the City's Public Works permit process.

602.02 STORM DRAINAGE PLANS

602.02.A Complete plans and specifications for proposed storm drain projects, including any necessary public dedications and easements, shall be submitted to the City Engineer for review. Such plans and specifications must receive City Engineer approval prior to construction permit issuance and prior to beginning of construction. Engineering documents shall be prepared by a Professional Engineer registered and licensed in the State of Oregon.

602.02.B Engineering design plans drawn to scale, showing the existing and proposed storm drain system, shall be submitted in accordance with Division 2 of these Design Standards. The proposed plan shall show profile and plan view of the proposed improvements.

602.03 PIPE MATERIALS AND SIZE

602.03.A Public storm drains shall be constructed with non-reinforced concrete pipe, reinforced concrete pipe, smooth interior, corrugated exterior HDPE pipe, or PVC pipe, as specified in the Standard Construction Specifications, unless approved otherwise. Pipe material shall be uniform throughout segmented manhole pipe runs. Tracer wire shall be a minimum 12-gauge, green-coated copper wire and shall be installed with all plastic pipe. Where required for added strength, Class 52 or greater ductile iron pipe or concrete pipe meeting the applicable Sections of ASTM C-76 shall be used. Regardless of selected pipe material, all joints shall be watertight.

602.03.B Public storm drain main lines (Collectors and Trunk lines) shall be a minimum of 12-inches in diameter. Public storm drain connector pipes to side-inlet catch basins and other inlet structures shall be a minimum of 10-inches in diameter.

602.03.C When two (2) parallel pipes are installed in-lieu-of one (1) large pipe or a box culvert, the minimum separation between the pipes shall be 1-foot or one-third the diameter of the largest diameter pipe,



whichever is greater. This requirement may be waived if the void between the pipes below the spring line is filled by grouting, controlled-density fill, or other City approved method/substance.

602.04 STORM DRAINAGE SYSTEM CLASSIFICATION

602.04.A PRIVATE STORM DRAINS. A privately owned, operated, and maintained storm drain system which serves one or multiple building storm drains, catch basins, area drains, or other stormwater facilities located on private property outside rights-of-way or public easements. Private storm drains typically consist of the following:

- ❖ Private building roof drains, typically 3-inches in diameter.
- ❖ Private storm drains that are directly connected to public storm drain systems, where specifically allowed by the City Engineer, typically 6-inches in diameter.
- ❖ Private storm drain conveyance systems located within private property.
- ❖ Private stormwater quantity and quality facilities, as required by the City Engineer.

602.04.B INLET CONNECTOR PIPES (sometimes also referred to as LATERALS). A public storm drain 10 inches to 18 inches in diameter which connects inlets (side-inlet catch basins, curb inlets, inlet manholes, and/or ditch inlets) to collector or trunk main storm drain systems. This portion of the system is designed to convey the required storm event of the entire contributing area in an un-surcharged state. Inlet connector pipes terminate at the subsequent downstream point at which it connects to a collector main or trunk main storm drain system.

602.04.C COLLECTOR MAINS. A public storm drain main line 12 inches to 21 inches in diameter which accommodates one or more inlet connector pipes and/or other storm drain collector mains. This portion of the system is designed to convey the required storm event of the entire contributing area in its fully developed land use condition. This portion of the storm drain system begins with a 12-inch or larger diameter pipe at the discharge point of the inlet connector pipes and terminates at the subsequent downstream point at which it is no longer capable of conveying the flow in an un-surcharged state in an 21-inch diameter pipe, at which point the system becomes a trunk storm drain system.

602.04.D TRUNK MAINS. A public storm drain main line 24 inches in diameter and larger to which one or more collector main lines and/or other storm drain trunk main lines connect or may connect. Trunk storm drain main lines may consist of man-made facilities such as pipes, ditches, and culverts or may consist of waterways. This portion of the system is designed to convey the required storm event of the entire contributing area in its fully developed land use condition, assuming on-site and/or regional detention has been incorporated in the design.

602.04.E CULVERTS. A stormwater conveyance system which provides for passage of water under or through traveled ways or obstructions placed across streams and waterways. Culverts shall be 12 inches in diameter and larger for driveways and 18 inches in diameter and larger for crossings of street rights-of-way. Culverts shall be designed to at minimum convey the 25-year storm event (50-year storm event for Collector and Arterial Streets) of the entire contributing area and shall be designed to pass the required flows without compromising public safety or causing new or additional flooding. Culverts that convey flows from or through natural creeks, streams, flood hazards or other sensitive areas, or as otherwise deemed appropriate by the City Engineer, shall be designed to convey the 100-year storm event. Fish passage accommodations may be required on any creek and stream that has a history or the potential for fish production. In this case, a local representative of Oregon Department of Fish and Wildlife (ODFW) or other applicable state or federal agency shall be contacted by the Design Engineer to identify site-specific design criteria and to determine if fish passage is required.



602.05 STORMWATER DESIGN SUMMARY

602.05.A CONVEYANCE SYSTEMS. Conveyance systems shall be designed to convey the peak flows of the design storm recurrence interval shown in Table 602.05.A. Where required, a downstream capacity analysis shall be performed in accordance with Section 603.01.B.

Table 602.05.A CONVEYANCE SYSTEM DESIGN REQUIREMENTS

SYSTEM ELEMENT		DESIGN STORM RECURRENT INTERVAL
Local and Collector Streets ⁽¹⁾⁽²⁾	Surface drainage (driveways, streets, alleys, curbs, curbs and gutters, inlets)	10-year
	Inlet Connector Pipes and Collector Mains (pipes 10" to 21")	25-year
	Trunk Mains (pipes 24" and larger)	25-year
	Ditches and Culverts	25-year
Arterial Streets ⁽¹⁾⁽²⁾	Surface drainage (driveways, streets, alleys, curbs, curbs and gutters, inlets) and inlet connector pipes	25-year
	Collector Mains (pipes 12" to 21")	50-year
	Trunk Mains (pipes 24" and larger)	50-year
	Ditches and Culverts	50-year
Watercourses ⁽²⁾	Without designated floodplain	50-year
	With designated floodplain	100-year
Bridges ⁽²⁾	All	100-year

Notes:

1. *The width of gutter flow on all street classifications shall not exceed 8 feet from face of curb or 3 inches in depth measured at the curb face for the required storm event at any point along the street. Inlets shall be designed to completely intercept the storm event gutter flow. Sag vertical curves in major collectors and arterials shall be designed to intercept the 50-year storm event. The 100-year design storm shall be evaluated and provisions shall be provided at all locations where ponding to hazardous depths are likely to occur. Emergency access shall be provided at all times.*
2. *Adequacy of the conveyance system may be required to be demonstrated by performing and submitting for City review and approval hydraulic grade line calculations and/or a downstream capacity analysis. Surcharged conditions for pipe systems and culverts and bank-full conditions for open ditches and channels are acceptable only for demonstrating the adequacy of the conveyance system to convey the peak runoff for the required design storm, provided that:*
 - a. *Runoff is contained within defined conveyance system elements, and*
 - b. *Hydraulic grade line does not exceed the elevation of the roadway subgrade, and*
 - c. *No portions of a building will be flooded.*

602.05.B STORMWATER QUALITY. Development which creates new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, is required to comply with the stormwater quality requirements in Table 602.05.B. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quality requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite. All projects shall comply with the City’s stormwater operations and maintenance (O&M) plan and agreement requirements and source control requirements.



Table 602.05.B STORMWATER QUALITY (POLLUTION REDUCTION) DESIGN REQUIREMENTS

SYSTEM ELEMENT	REQUIREMENTS
<p>Stormwater Quality Facilities⁽¹⁾</p> <p><i>Exemptions: Runoff from residential roofs (three units or less) that goes directly to infiltration facilities.</i></p>	<ul style="list-style-type: none"> ❖ Shall achieve 70 percent TSS removal from 90 percent of the average annual runoff. ❖ Shall be designed to address the Willamette Basin TMDL pollutants of mercury, temperature, and bacteria. ❖ Shall use vegetated facilities to infiltrate onsite to the maximum extent feasible.

Notes:

1. Design shall be in accordance with the most current edition of the City of Portland SWMM. Other proposed facilities shall be approved by the City Engineer prior to design.

602.05.C STORMWATER QUANTITY. Development which creates new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, is required to comply with the flow control requirements described in Table 602.05.C. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quantity requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite. All projects shall comply with the City’s stormwater operations and maintenance (O&M) plan and agreement requirements and source control requirements.

Table 602.05.C STORMWATER QUANTITY (FLOW CONTROL) DESIGN REQUIREMENTS

SYSTEM ELEMENT		REQUIREMENTS
<p>Detention Facilities⁽¹⁾⁽²⁾</p> <p><i>Detention Exemptions: Sites that drain directly to the North Santiam River as approved by the City Engineer. Pollution reduction requirements still apply.</i></p>	All Facilities	<ul style="list-style-type: none"> ❖ Shall use vegetated facilities to infiltrate onsite to the maximum extent feasible. ❖ Limited to pre-developed peak runoff rates for the 2, 5, 10, 50 and 100-year storm events. 25-year post-developed peak runoff rate shall be limited to the 10-year pre-developed peak runoff rate. Flow control, is also a function of downstream capacity. ❖ Emergency overflow provisions required.
<p>Retention Facilities⁽¹⁾⁽²⁾</p> <p><i>Retention Exemptions: Sites with unstable soils, contamination, or high risk of contamination.</i></p>	Infiltration Capacity	<ul style="list-style-type: none"> ❖ Shall use vegetated facilities to infiltrate onsite to the maximum extent feasible. ❖ Designed for 100-year storm event ❖ Seasonal High Groundwater shall be verified (5’ min vertical separation, unless otherwise approved) ❖ Emergency overflow provisions required.

Notes:

1. Provisions for an adequate and approved emergency overflow system are required to convey the post-developed peak runoff rates for the 100-year storm event to an acceptable point of discharge. Additional provisions shall be provided at all locations where the emergency overflow system will create ponding to hazardous depths. Emergency access shall be provided at all times.
2. As approved by the City Engineer (and DEQ as applicable). Design shall be in conformance with the City of Stayton Public Works Standards, City of Portland SWMM and DEQ requirements, as applicable.



602.06 LAND USE APPLICATION STORMWATER SUBMITTAL REQUIREMENTS

602.06.A PRELIMINARY DRAINAGE IMPACT ANALYSIS. At the time a land use application is filed, the applicant shall provide a preliminary drainage impact analysis or a preliminary drainage report for City review. The analysis shall include a preliminary stormwater plan, preliminary stormwater calculations, and a stormwater narrative which identifies the impacts the “new development” will have on existing stormwater systems and receiving waterbodies. The stormwater narrative shall at minimum include and discuss the following. A more complete stormwater analysis and Drainage Report per Section 603.01.A will be required to be submitted following the land use application phase.

1. A brief description of existing and developed site conditions, including pervious and impervious surface area calculations.
2. The proposed stormwater facilities required to comply with the stormwater quality (pollutant reduction) requirements, including any source control requirements.
3. The proposed stormwater facilities required to comply with the stormwater quantity (flow control) requirements, including existing and design infiltration rates, the preliminary pre-development and post-development stormwater runoff flow rates.
4. The method of discharging stormwater offsite and any anticipated design provisions needed to control the velocity and direction of the discharge in order to minimize damage to receiving stormwater systems or water bodies.



603 MINIMUM DESIGN CRITERIA

603.01 STORMWATER ANALYSIS REQUIREMENTS

603.01.A DRAINAGE REPORT

1. The Drainage Report shall be on 8-1/2" x 11" paper and maps shall be folded to 8-1/2" x 11" size unless another format is approved prior to submittal. See Section 612 for the Drainage Report Sample Format.
2. The Drainage Report shall be prepared by, and bear the seal and original signature of, a Professional Engineer registered in the State of Oregon and shall contain the following information:
 - a. COVER SHEET. Provide the project name, the City of Stayton land use file number, the Owner's name, address, and telephone number, the Design Engineer's name, address, and telephone number, and the date of the submittal. The Cover Sheet shall also indicate the status of the Drainage Report, either as being the final version or a preliminary draft.
 - b. TITLE SHEET. Provide the Design Engineer's certification statement, stamp/seal. The design professional shall stamp and sign the statement with their Oregon registration stamp.

"I hereby certify that this Drainage Report for _____ (name of project) has been prepared by me or under my direct supervision and complies with the City of Stayton's Public Works Standards and standard engineering practice.
 - c. TABLE OF CONTENTS. Provide the page numbers for each section of the report, including figures, tables, charts, appendices, exhibits, or attachments.
 - d. PROJECT OVERVIEW AND DESCRIPTION: Describe the project, including the size and location, proposed land use, proposed site improvements, proposed construction of impervious surfaces, proposed landscaping, and special circumstances. Either include, or provide an attachment reference to, a project Vicinity Map.
 - 1) Project Planning and Permit Requirements: Provide the project's planning information including the address or parcel information, property zoning, etc. List any required City of Stayton permit(s) for which the proponent is applying for. List any other applicable permits required from other jurisdictions (e.g. DEQ Rule Authorization, Corps of Engineers 404 Fill Permit, DSL Permit, DEQ 1200-C Permit, etc). Include references to relevant reports such as basin plans, flood studies, groundwater studies, wetland designation, watershed plans, sub-basin master plans, sensitive area designation, environmental impact statements, stormwater quality reports, or other relevant documents. Where such reports impose additional project conditions, those conditions shall be included in the report.
 - e. REGULATORY DESIGN CRITERIA: Provide a summary of the City's stormwater quality (pollutant reduction) and quantity (flow control) requirements and include a summary of any other jurisdictional requirements that the stormwater system design will need to comply with. Include a summary of the 24-hour rainfall depths used in the analysis.



- f. DESIGN METHODOLOGY: Provide site specific information, methodologies, and modeling used to develop the stormwater system design, including:
- 1) Hydrologic and hydraulic modeling software used in the analysis.
 - 2) Infiltration testing results needed for any infiltration/retention facilities.
 - 3) Seasonal high groundwater elevation/depth results and any impacts it may have on the proposed stormwater management techniques.
 - 4) Narrative that describes the proposed stormwater management techniques, including how to meet the site-specific stormwater requirements for infiltration, seasonal high groundwater separation distances, or offsite discharge.
- g. PRE-DEVELOPED SITE CONDITIONS
- 1) Pre-developed Site Information: Describe the existing site conditions and relevant hydrological conditions including, but not limited to, the following:
 - ❖ Existing sub-basin total area and approximate pervious and impervious surface areas,
 - ❖ Existing topography;
 - ❖ Any offsite contributing drainage areas;
 - ❖ Any natural and constructed channels; sensitive areas, wetlands, creeks, ravines, gullies, steep slopes, springs and other environmentally sensitive areas on or adjacent to the project site.
 - ❖ Any existing points of discharge from the site;
 - ❖ Existing floodplain and floodway limits, and ordinary high water elevation marks, as applicable.
 - 2) Existing Soils Information: Describe the project's existing soil engineering properties including the NRCS soil designations/classifications, etc. Identify any sources of runoff to the project site and any existing drainage or erosion issues upstream that may have an impact on the proposed development. This should be based on field investigation. Provide a soils report(s), where applicable.
 - 3) Provide Sub-basin Map(s) showing proposed boundaries, any offsite contributing drainage sub-basins, onsite drainage sub-basins, approximate locations of all major drainage structures within the sub-basins, and depicting the course of stormwater through the subject property and extending all the way to the closest receiving body of water. The sub-basin maps shall also show the assumed time of concentration flow paths, the design point locations, the source of the topographic base map (e.g. USGS), the scale of the map, and north arrow. The existing sub-basin maps shall be submitted with all necessary calculations and shall clearly show how stormwater is routed through the existing site.
- h. POST-DEVELOPED SITE CONDITIONS
- 1) Post-Developed Site Information: Describe the developed site conditions and relevant hydrological conditions including, but not limited to, the following:
 - ❖ Approximate sub-basin total area and approximate pervious and impervious surface areas. The amount of impervious surface area for each lot or parcel that has been included in the stormwater calculations shall be shown in the



stormwater drainage report narrative and noted on the stormwater plans, including what the impervious surface area calculation includes (e.g., sidewalks, driveways, driveway approach, roof, etc.). Note that if a building permit comes in showing more impervious surface area for a lot than what was originally included in the stormwater drainage report calculations, then the builder will be required to submit stormwater calculations, and either enlarge the stormwater facility or construct onsite stormwater facilities (for each individual lot) to offset the difference in impervious surface areas. As such, the Design Engineer shall verify what the maximum anticipated impervious surface areas will be for each lot or parcel early in the design phase, so the builder will not have any stormwater issues when it comes time for building permits.

- ❖ Developed topography;
- ❖ Proposed method to address any offsite contributing drainage areas;
- ❖ Proposed method to address any natural and constructed channels; sensitive areas, wetlands, creeks, ravines, gullies, steep slopes, springs and other environmentally sensitive areas on or adjacent to the project site.
- ❖ Proposed stormwater improvements and points of discharge from the site;
- ❖ Floodplain and floodway limits, and ordinary high water elevation marks, as applicable.

- 2) Provide Sub-basin Map(s) showing proposed boundaries, any offsite contributing drainage sub-basins, onsite drainage sub-basins, approximate locations of all major drainage structures within the sub-basins, and depicting the course of stormwater through the subject property and extending all the way to the closest receiving body of water. The sub-basin maps shall also show the assumed time of concentration flow paths, the design point locations, the source of the topographic base map (e.g. USGS), the scale of the map, and north arrow. The developed sub-basin maps shall be submitted with all necessary calculations and shall clearly show how stormwater is being routed through the developed site.
 - i. HYDROLOGIC ANALYSIS. Include all relevant hydrologic design calculations, including time of concentration calculations, rainfall intensity, curve numbers/runoff coefficients, and other necessary information. Provide a summary table comparing the pre-developed and post-developed peak flow rates for all discharge points for the 2, 5, 10, 25, 50, and 100-yr storm events. The table shall show the peak flow rates **without** the proposed stormwater quantity facility.
 - j. STORMWATER MANAGEMENT FACILITY DESIGN. Include all relevant design calculations, including safety factors, design coefficients, and other necessary information for all proposed stormwater quality and quantity control facilities. Provide calculations verifying the capacity and design of any existing stormwater facilities to remain. Calculations shall include outlet control and overflow computations as required, and the determination of the emergency overflow escape route and inundation level for the post-developed 24-hour 100-year storm event. Provide a summary table comparing the pre-developed and post-developed peak flow rates for all discharge points for the 2, 5, 10, 25, 50, and 100-yr storm events. The table shall show the peak flow rates **with** the proposed stormwater quantity facility.
 - k. CONVEYANCE SYSTEM DESIGN. Provide supporting design information for all proposed conveyance systems. Provide calculations verifying the capacity of new and existing drainage systems. These computations may include capacity and hydraulic grade line calculations required either as part of the proposed storm drainage system design or as part of the downstream capacity analysis, for flood routing computations required for the



design of detention/retention storage facilities, for wetland impact analysis, or for floodplain analysis. When required, hydraulic grade line(s) shall be shown on the plan and profile sheets.

- I. **DOWNSTREAM CAPACITY ANALYSIS SUMMARY/REPORT.** See Section 603.01.B for downstream capacity analysis requirements. If a downstream capacity analysis is required, the summary/report shall identify any capacity issues that may result from the project/development runoff, and provide the supporting data and calculations as required. The summary/report shall provide recommendations for mitigation downstream capacity issues identified. Where open channel hydraulic modeling is used in the downstream analysis, the following information shall be included:
 - ❖ A site map showing the location of the project and the surrounding drainage basin.
 - ❖ A description of all calculations, references, and modeling used in the analysis.
 - ❖ A discussion of how Manning's n-values were determined, including photos of typical cross sections used in determining the n-values.
 - ❖ A description of the storm events used in the study.
 - ❖ A brief description of the physical condition and the estimated capacity of all existing drainage structures analyzed.
 - ❖ A list of any previous hydraulic analysis and references relied on for the current study.
 - ❖ Cross section plots for all cross sections, plotted at no more than two per 8½ x 11 sheet. Each cross section shall be scaled consistently and properly labeled with the cross section number. Cross sections shall be perpendicular to the flow and waterway centerline. Sections shall be oriented left to right facing downstream and show the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year water surface elevations.
 - ❖ A digital file with the model input and output files shall be included in the report package, as applicable.
 - ❖ Additional information may be required by the City as appropriate, based on the size and complexity of the project.
- m. **FLOODWAY/FLOODPLAIN ANALYSIS.** If a Floodway/Floodplain Analysis is required, provide a description of how the upstream and downstream boundary conditions were established. All proposed grading, culverts, bridges, drop structures, access ramps, etc., that are in the floodplain must be shown and included in the modeling. Describe the floodway analysis. Provide photographs of the existing study reach shall be included. A table with existing and proposed water surface elevations and velocities at each cross section shall be shown. The 100-year floodplain and floodway lines shall be clearly shown on the map based on the modeling results and tied to the appropriate contour lines.
- n. **ENGINEERING CONCLUSIONS/RECOMMENDATIONS.** Provide a summary of how the project satisfies the stormwater quality, quantity and discharge requirements. Provide a summary of how the stormwater design complies with other local, State, and Federal stormwater requirements. Provide a description of how the stormwater system will function during the 100-year storm event and any provisions needed to convey the 100-year storm event to an approved point of discharge. Provide recommendations for mitigation of any downstream capacity issues identified (as applicable). Provide recommendations based on floodway and floodplain analysis (as applicable).
- o. **OPERATION AND MAINTENANCE PLAN AND AGREEMENT:** An operation and maintenance (O&M) plan and agreement is required for privately owned and maintained stormwater quality and quantity control facilities. The O&M plan will need to be an



attachment to the Drainage Report, to any declaration of covenants for the project, and included as part of the recorded O&M Agreement.

- p. APPENDICES. Provide supporting data and technical information as necessary.

603.01.B DOWNSTREAM CAPACITY ANALYSIS REQUIREMENTS

1. Connections to downstream stormwater systems (including roof drain connections) will not be allowed if a capacity issue exists or may exist after the connection is made, as identified through flood complaint calls, operational knowledge, or from the Stormwater Master Plan. The Developer will be required to perform an analysis of the downstream stormwater system and make the needed capacity improvements or provide other means to mitigate the downstream impacts, and/or provide additional on-site detention/retention if capacity issues exist or may exist. This applies to all types of development in which a permit is required.
2. The analysis shall be divided sequentially into three parts: REVIEW OF RESOURCES; INSPECTION OF THE AFFECTED AREA; AND ANALYSIS OF DOWNSTREAM EFFECTS.
 - a. REVIEW OF RESOURCES. During the review of resources, the Design Engineer shall review any existing data concerning drainage of the project area. This data will commonly include area maps, floodplain maps, wetland inventories, stream surveys, habitat surveys, engineering reports concerning the entire drainage basin, inventories of known drainage problems, and previously completed downstream analyses. The City may be able to provide most of this information. Other sources of information include, Oregon Department of Environmental Quality, Oregon Department of State Lands, Department of Fish and Wildlife, and other local agencies.
 - b. INSPECTION OF THE AFFECTED AREA. During the inspection of the affected area, the Design Engineer shall physically inspect the drainage system at the project site and downstream of the site. During the inspection, the Design Engineer shall investigate any problems or areas of concern that were noted during the review of resources. The Design Engineer shall also identify any existing or potential capacity problems in the drainage system, any existing or potential areas where flooding may occur, any existing or potential areas of channel destruction (including erosion and sedimentation), and existing or potential areas of significant destruction of aquatic habitat.
 - c. ANALYSIS OF THE DOWNSTREAM EFFECTS. During the analysis of downstream effects, the information that has been gathered shall be analyzed to determine if construction of the project will create any drainage problems downstream or will make any existing problems worse. Whenever a situation is encountered where it has been determined that there will be negative impacts resulting from the project, mitigation measures shall be included in the project to correct for the impacts. The downstream capacity analysis shall:
 - 1) Be based on peak flows at the point of discharge for the design storm recurrence intervals shown in Section 602.05.A.
 - 2) Evaluate the system's conveyance capacity from the point of discharge, 1/4 mile downstream or to a distance where the project site contributes less than 10 percent of the upstream drainage basin area, whichever is greater.
 - 3) Use the Manning's Formula for evaluating the capacity of pipes, ditches, and waterways. Backwater effect shall be included in determining capacity for waterways



with drainage areas greater than 250 acres using HEC-RAS or an equivalent computer modeling software. Surcharged conditions for pipe systems and culverts and bank-full conditions for open ditches and channels are acceptable only for demonstrating the adequacy of the conveyance system to convey the peak runoff for the required design storm in accordance with Section 602.05.A, provided that:

- a) Runoff is contained within defined conveyance system elements, and
- b) Hydraulic grade line does not exceed the elevation of the roadway subgrade, and
- c) No portions of a building will be flooded.

603.02 HYDROLOGY

603.02.A GENERAL

- 1. The Design Engineer is not limited to any one analytical method for hydrologic calculations. However, hydrograph analysis methods shall be used for the design of all stormwater quality (pollution reduction) facility designs and for all stormwater quantity (flow control) facility designs, unless otherwise approved in advance by the City Engineer.
- 2. Design Engineers are encouraged to use FEMA flow quantities for FEMA regulated waterways.

603.02.B RATIONAL METHOD

1. GENERAL

- a. The Rational Method may be used for analyzing small drainage basins with the following limitations:
 - 1) Only for use in predicting a conservative peak flow rate to be used in determining the required capacity for conveyance elements.
 - 2) Drainage sub-basin area cannot exceed 25 acres for a single calculation without approval from the City.
 - 3) The time of concentration shall be five minutes when computed to be less than five minutes.
- b. The Rational Method shall not be used for the design of stormwater quality (pollution reduction) or stormwater quantity (detention) facilities unless otherwise approved in advance by the City Engineer.

2. RATIONAL FORMULA (Source: ODOT Hydraulics Manual, 2011):

a. EQUATION:

$$Q = C_F * C * I * A$$

Where,

Q = peak flow in cubic feet per second.



- C_F = a runoff coefficient adjustment factor to account for reduction of infiltration and other losses during high intensity storms.
- C = a runoff coefficient determined by ground cover. The engineer must document the methodology used in determining the value proposed.
- I = rainfall intensity in inches per hour. Rainfall intensity found on the ODOT Zone 8, I-D-F curve (as shown in Section 612) shall be used. For the Rational Method, the basin time of concentration is used as the storm duration. The time of concentration must first be calculated (see Time of Concentration below), and then the rainfall intensity can be read from the I-D-F curve.
- A = the basin area in acres.

b. RUNOFF COEFFICIENT “C”

- 1) The runoff coefficient is often difficult to estimate because it represents the interaction of many complex factors including surface ponding, infiltration, antecedent moisture, ground cover conditions, ground slopes, and soil type. The actual runoff coefficient for a given drainage basin can best be approximated by calculating a weighted average of all distinct surface types:

$$C_{AVG} = \frac{\sum(C_{i\text{ AREAS}})(A_{i\text{ AREAS}})}{A_{TOTAL\text{ AREA}}}$$

Where,

- C_{AVG} = the weighted average C-value for the drainage basin.
- $C_{i\text{ AREAS}}$ = individual C-values for distinct surface types within a subbasin.
- $A_{i\text{ AREAS}}$ = individual areas for distinct surface types within a subbasin.
- $A_{TOTAL\text{ AREA}}$ = total area of the drainage basin.

- 2) The impervious surface area is often a factor in stormwater storage and stormwater quality treatment designs. Impervious surfaces have runoff coefficients greater than 0.80 based on Table 603.02.B.2.b.2.

Table 603.02.B.2.b.2) RUNOFF COEFFICIENTS “C” (for Rational Method)

Surface Type	Flat (0 - 2%)	Rolling (2% to 10%)	Hilly (Over 10%)
Pavement & Roofs	0.90	0.90	0.90
Earth Shoulders of Roadways	0.50	0.50	0.50
Drives & Walks	0.75	0.80	0.85
Gravel Surfacing	0.85	0.85	0.85
City Business Areas	0.80	0.85	0.85
Apartment Dwelling Areas	0.50	0.60	0.70
Light Residential: 1 to 3 units/acre	0.35	0.40	0.45
Normal Residential: 3 to 6 units/acre	0.50	0.55	0.60
Dense Residential: 6 to 15 units/acre	0.70	0.75	0.80
Lawns	0.17	0.22	0.35
Grass Shoulders	0.25	0.25	0.25
Side Slopes, Earth	0.60	0.60	0.60
Side Slopes, Turf	0.30	0.30	0.30
Median Areas, Turf	0.25	0.30	0.30
Cultivated Land, Clay & Loam	0.50	0.55	0.60



Surface Type	Flat (0 - 2%)	Rolling (2% to 10%)	Hilly (Over 10%)
Cultivated Land, Sand & Gravel	0.25	0.30	0.35
Industrial Areas, Light	0.50	0.70	0.80
Industrial Areas, Heavy	0.60	0.80	0.90
Parks & Cemeteries	0.10	0.15	0.20
Playgrounds	0.20	0.25	0.30
Woodland & Forests	0.10	0.15	0.20
Meadows & Pasture Land	0.25	0.30	0.35
Unimproved Areas	0.10	0.20	0.30

Note: Impervious surfaces are shown in **bold**.

- c. RUNOFF COEFFICIENT ADJUSTMENT FACTOR “C_F” – The Coefficients in the Table above are applicable for 10-years or less recurrence interval storms. Less frequent, higher intensity storms require adjusted runoff coefficients because infiltration and other losses have a proportionally smaller effect on runoff. Runoff coefficient adjustment factors (C_F) for storms of different recurrence intervals are listed in Table 603.02.B.2.c.

Table 603.02.B.2.c RUNOFF COEFFICIENT ADJUSTMENT FACTORS “C_F” (for Rational Method)

Recurrence Interval	Runoff Coefficient Adjustment Factor (C _F)
10 years or less	1.0
25 years	1.1
50 years	1.2
100 years	1.25

- d. RAINFALL INTENSITY "I" – This variable indicates rainfall severity. Rainfall intensity is related to rainfall duration and design storm recurrence interval. Rainfall intensity at a duration equal to the time of concentration (T_c) is used to calculate the peak flow in the Rational Method. Calculations for Time of Concentrations are shown in Subsection 603.02.D below. Once the time of concentration is known, the rainfall intensity can be selected from the ODOT Zone 8 I-D-F curve shown in Section 612.

603.02.C HYDROGRAPH METHOD

1. GENERAL

- a. Hydrograph methods shall be used for all stormwater quality (pollution reduction) facility designs, for all stormwater quantity (flow control) facility designs, unless otherwise approved in advance by the City Engineer.
- b. The physical characteristics of the site and the design storm shall be used to determine the magnitude, volume and duration of the runoff hydrograph. The Santa Barbara Urban Hydrograph (SBUH) is the primary acceptable hydrograph method. However, other acceptable methods include the Natural Resources Conservation Service (NRCS) TR-20 method, the TR-55 method, or other similar methods. If a software package is used, documentation of the software's processing and methodology shall be submitted with the results. All input and assumptions shall be clearly documented. The typical input information needed for the hydrograph methods are:



- ❖ Rainfall Distribution
- ❖ Total 24-hour Rainfall
- ❖ Time of Concentration (see Subsection 603.02.D)
- ❖ Basin Area
- ❖ Curve Number (CN)

c. Trunk main lines and all improvements that require detention shall be designed only after a full analysis of the basins contributing to the improvements is completed. Hydrographs for all basins shall be developed.

2. RAINFALL DISTRIBUTION

a. The rainfall distribution to be used within the City is the design storm of 24-hour duration based on the standard NRCS Type 1A rainfall distribution as shown in Section 612.

3. 24-HOUR RAINFALL FOR STAYTON

a. The 24-hour rainfall totals for the given return intervals shall be in accordance with the rainfall depths presented in the Stormwater Master Plan (Table 3.1), as shown in Table 603.02.C.3.

Table 603.02.C.3 24-HOUR RAINFALL DEPTHS

Return Interval	Peak 24-Hour Rainfall
Water Quality Storm Event	1.61 inches
2-year Storm Event	2.50 inches
5-year Storm Event	3.00 inches
10-year Storm Event	3.50 inches
25-year Storm Event	4.00 inches
50-year Storm Event	4.50 inches
100-year Storm Event	4.60 inches

4. BASIN AREA

- a. To obtain the highest degree of accuracy in hydrograph analysis, requires the proper selection of homogeneous basin areas. Significant differences in land use within a given basin must be addressed by dividing the basin area into sub-basin areas of similar land use and/or runoff characteristics. Hydrographs should be computed for each sub-basin area and superimposed to form the total runoff hydrograph for the basin.
- b. Pervious and impervious areas within a given basin or sub-basin shall generally be analyzed separately. This may be done by either computing separate hydrographs or computing the precipitation excess. The total precipitation excess is then used to develop the runoff hydrograph. By analyzing pervious and impervious areas separately, the cumulative errors associated with averaging these areas are avoided and the true shape of the runoff hydrograph is better approximated.



5. RUNOFF CURVE NUMBERS

a. GENERAL

- 1) Runoff curve numbers were developed by the Natural Resources Conservation Service (NRCS) (formerly referred to as the Soil Conservation Service (SCS)) after studying the runoff characteristics of various types of land. Curve numbers (CN) were developed to reduce diverse characteristics such as soil type, land usage, and vegetation into a single variable for doing runoff calculations. The approved runoff curve numbers are included in Section 612.
- 2) The curve numbers presented in Section 612 are for wet antecedent moisture conditions. Wet conditions assume previous rainstorms have reduced the capacity of soil to absorb water. Given the frequency of rainstorms in the City, wet conditions are most likely, and give conservative hydrographic values.
- 3) The following are important criteria/considerations for selection of CN values:
 - a) Many factors may affect the CN value for a given land use. For example, the movement of heavy equipment over bare ground may compact the soil so that it has a lower infiltration rate and greater runoff potential.
 - b) CN values can be area weighted when they apply to pervious areas of similar CN (within 20 CN points). However, high CN areas should not be combined with low CN areas (unless the low CN areas are less than 15 percent of the sub-basin).
 - c) Antecedent soil moisture values should be considered. Soil should be considered to be moist prior to the start of the precipitation event.

b. HYDROLOGIC SOIL GROUP DESCRIPTION – Curve Numbers have been assigned to one of four hydrologic soil groups, according to their runoff characteristics as described below:

- 1) Group A Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.
- 2) Group B Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- 3) Group C Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.
- 4) Group D Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a fragipan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.



c. CURVE NUMBER EQUATIONS:

- 1) The area's potential maximum storage capacity, S, is related to its curve number, CN:

$$S = (1000 / CN) - 10$$

- 2) The rainfall-runoff equations of the NRCS curve number method relate a land area's runoff depth (precipitation excess) to the precipitation it receives and to its natural storage capacity, as follows:

$$Q_{INCHES} = \frac{(P - 0.2S)^2}{(P + 0.8S)} \text{ for } P \geq 0.2S; \text{ and}$$

$$Q_{INCHES} = 0 \text{ for } P < 0.2S$$

Where,

- Q_{INCHES} = runoff depth in inches over the area
- P = precipitation depth in inches over the area
- S = potential maximum storage capacity, in inches over the area, due to infiltration, storage, etc.

- 3) The computed runoff represents inches over the tributary area. Therefore, the total volume of runoff is found by multiplying Q_{INCHES} by the area (with necessary conversions):
 - a) Total Runoff Volume (cubic-feet) = Q_{INCHES} (in) x A (ac) x 3,630 (cubic-feet/(ac-in))
- 4) When developing the runoff hydrograph, the above equation for Q_{INCHES} is used to compute the incremental runoff depth for each time interval from the incremental precipitation depth given by the design storm hyetograph. This time distribution runoff depth is often referred to as the precipitation excess and provides the basis for synthesizing the runoff hydrograph.

603.02.D TIME OF CONCENTRATION

- 1. Time of concentration is a very important variable in determining runoff volumes and peak flows. Time of concentration calculations shall be submitted for review. There are three components that shall be considered when determining time of concentration: OVERLAND SHEET FLOW (T_{OSF}), SHALLOW CONCENTRATED FLOW (T_{SCF}), and CHANNEL/PIPE FLOW (T_{CPF}). The three runoff flow time components shall be calculated separately and then added together to determine the total basin time of concentration (source: ODOT Hydraulics Manual, 2011).
- 2. OVERLAND SHEET FLOW – Overland sheet flow is shallow flow over a plane surface. It occurs in the furthest upstream segment of the drainage path, which is located immediately downstream from the drainage divide. The length of the overland sheet flow segment is the shorter of (1) the distance between the drainage divide and the upper end of a defined channel, or (2) a distance of 300 feet. For the first 300 feet of overland flow, the sheet flow time of concentration can be calculated using the following equations.
 - a. KINEMATIC WAVE METHOD (for use with IDF curves): Overland sheet flow of runoff to the initial catchment point into the storm drain system shall be a minimum of 5 minutes.



$$T_{OSF} = \frac{0.93L^{0.6}n^{0.6}}{I^{0.4}S_o^{0.3}}$$

Where,

- T_{OSF} = Travel time for the overland sheet flow segment in minutes.
- L = Length of overland flow in feet (300 feet max).
- N = Manning's Roughness Coefficient.
- I = Rainfall intensity in inches per hour.
- S_o = The average slope of overland area in feet per feet.

- b. MANNING'S KINEMATIC SOLUTION (for use with NRCS method). Overland sheet flow of runoff to the initial catchment point into the storm drain system shall be a minimum of 10 minutes.

$$T_{OSF} = \frac{0.42(nL)^{0.8}}{P_2^{0.5}S_o^{0.4}}$$

Where:

- T_{OSF} = Travel time for the overland sheet flow segment in minutes.
- n = Manning's roughness coefficient.
- L = Length of flow in feet
- P₂ = 2-year, 24-hour rainfall in inches.
- S_o = The average slope of overland area in feet per feet.

Surface Type	Manning's n
Pavement & Roofs	0.014
City Business Areas	0.014
Graveled Surfaces	0.020
Apartment Dwelling Areas	0.050
Industrial Areas	0.050
Urban Residential Areas (more than 6 units/acre)	0.080
Meadows, Pastures, & Range Land	0.150
Rural Residential Areas (more than 6 units/acre)	0.240
Playgrounds, Light Turf	0.240
Parks & Cemeteries, Heavy Turf	0.400
Woodland & Forests	0.400

3. SHALLOW CONCENTRATED FLOW

- a. To determine the flow time of runoff in the shallow concentrated flow regime, the flow velocity will need to be estimated. The average velocity is a function of watercourse slope and surface type and can be approximated using the figure shown in Section 612 (*source: ODOT Hydraulics Manual, originally from the 1972 Soil Conservation Service Handbook*). For slopes less than 0.005 feet per feet, the following equations can be used to determine the average flow velocity of the shallow concentrated flow.

For unpaved Surfaces: $V = 16.1345 * (S)^{0.5}$

For paved Surfaces: $V = 20.3282 * (S)^{0.5}$



Where:

- V = Velocity in feet per second
- S = Slope in feet per feet

- b. Once velocity is calculated, divide the distance of flow by velocity to get flow time in which the travel time for the concentrated flow segment can be calculated as follows:

$$T_{SCF} = \frac{L}{60V}$$

Where,

- T_{SCF} = Travel time for the shallow concentrated flow segment in minutes.
- L = Length of the shallow concentrated flow segment in feet.
- V = Average flow velocity in feet per second.

4. CHANNEL/PIPE FLOW

- a. The Manning Formula shall be used to calculate velocities in channels and pipes. Flow length shall then be divided by the velocity to get flow time. The Manning Formula is expressed by the following equation.

$$V = (1.486/n) * (R^{(2/3)}) * (S^{0.5})$$

Where:

- V = Mean velocity of flow in feet per second (V=Q/A).
- n = Manning's n, 0.013 minimum for pipe.
- R = Hydraulic Radius in feet, defined as the area of flow divided by the wetted perimeter (A / WP);
- A = cross sectional flow area in square feet.
- WP = wetted perimeter in feet.
- S = Slope of hydraulic grade line in feet per feet.

- b. Once velocity is calculated, divide the distance of flow by velocity to get flow time in which the travel time for the concentrated flow segment can be calculated as follows:

$$T_{CPF} = \frac{L}{60V}$$

Where,

- T_{CPF} = Travel time for the channel/pipe flow in minutes.
- L = Length of the channel/pipe flow segment in feet.
- V = Average flow velocity in feet per second.

- c. Note that new PVC or HDPE pipe likely have a manufacturer's "n" value of approximately 0.009. However, regardless of pipe material, sand, grit, and slime will build up on pipe walls. This results in true "n" values over time of approximately 0.013. As a consequence, a Manning coefficient of 0.013 shall be used for design of PVC or HDPE piping systems. If an alternative piping material is approved, either the pipe manufacturer's recommended coefficient shall be used or an "n" value of 0.013, whichever is greater.



603.03 VELOCITY AND SLOPE

- 603.03.A** Storm drains shall be laid on a grade that will produce a mean velocity, when flowing full or half-full, of at least 3-feet per second, based upon Manning's pipe friction formula using a roughness coefficient valued at not less than 0.013, or the pipe manufacturer's recommendations, whichever is greater. An "n" value of less than 0.013 will not be considered for approval.
- 603.03.B** The minimum slope may be reduced to produce an absolute minimum velocity of 2.5 feet per second upon approval of the City Engineer. But the grade of any pipe, regardless of diameter, shall not be less than 0.002-feet/foot unless otherwise authorized by the City Engineer. Other cases requiring a flatter slope than permitted above shall also be reviewed on a case-by-case basis for approval by the City Engineer. Design Engineers are cautioned not to specify storm drains of sizes that are obviously larger than is necessary for satisfactory carrying capacity, but which are specified solely in order to meet grade requirements, i.e., a 12-inch pipe for a 10-inch pipe to acquire a decrease in slope.
- 603.03.C** The maximum grade for storm drains will generally be limited such that pipeline velocities when flowing full do not exceed 15-feet/second. If, out of necessity, velocities greater than this will result, ductile iron piping shall be used. Drop manholes with flatter pipe slopes can also be used.
- 603.03.D** Where velocities in storm drains greater than 15-feet/second are attained, special provisions shall be made to protect structures against erosion and displacement by shock. Specific approval will be required from the City Engineer.
- 603.03.E** Storm drains laid on slopes greater than 15 percent, or as recommended by pipe manufacturer for slopes 15 percent and less, shall be secured by anchor walls in accordance with the Standard Drawings. Anchor walls located at the middle of pipe runs of less than 200 feet between structures are generally adequate, but for spans greater than 200 feet, anchor walls shall not exceed a spacing of 100 feet. Specific approval for slopes greater than 15 percent will be required from the City Engineer.

603.04 HYDRAULIC DESIGN

- 603.04.A** The Design Engineer shall submit calculations for each public storm drain system to be installed. The hydraulic design of storm drains shall be in accordance with the most current edition of the *ODOT Hydraulics Manual* or the *Hydraulic Engineering Circular No. 22 (FHWA-TS-84-202) Drainage of Highway Pavements*.
- 603.04.B** When calculating volumes, slopes, and velocities, the Manning Formula shall be used. Note that new PVC or HDPE pipe likely have a manufacturer's "n" value of approximately 0.009. However, regardless of pipe material, sand, grit, and slime build up on pipe walls. This results in true "n" values over time of approximately 0.013. As a consequence, a Manning coefficient of 0.013 shall be used for design of PVC or HDPE piping systems. If an alternative piping material is approved, either the pipe manufacturer's recommended coefficient shall be used or an "n" value of 0.013, whichever is greater.
- 603.04.C** The Manning Formula is expressed by the following equation:

$$V = (1.486/n) * (R^{(2/3)}) * (S^{0.5})$$

Where:

V = Mean velocity of flow in feet per second (V=Q/A).



- n = Manning's n, 0.013 minimum for pipe.
- R = Hydraulic Radius in feet, defined as the area of flow divided by the wetted perimeter (A / WP);
- A = cross sectional flow area in square feet.
- WP = wetted perimeter in feet.
- S = Slope of hydraulic grade line in feet per feet.

603.04.D In terms of discharge, the above equation becomes:

$$Q = (1.486/n) * A * (R^{(2/3)}) * (S^{0.5})$$

Where:

- Q = rate of flow in cubic feet per second
- V = Mean velocity of flow in feet per second (V=Q/A).
- n = Manning's n, 0.013 minimum for pipe.
- R = Hydraulic Radius in feet, defined as the area of flow divided by the wetted perimeter (A / WP);
- A = cross sectional flow area in square feet.
- WP = wetted perimeter in feet.
- S = Slope of hydraulic grade line in feet per feet.

603.04.E HYDRAULIC GRADE LINE

1. The hydraulic grade line (HGL) shall be evaluated as part of the design. The HGL represents the water surface elevation of the flow traveling through the storm drain system. If the HGL becomes higher at a manhole or inlet than the rim elevation of that structure, flow will leave the storm drain. This can cause severe traffic safety problems and must always be avoided.
2. Hydraulic grade line calculation procedures shall be in accordance with the most current edition of the *Hydraulic Engineering Circular No. 22 (FHWA-TS-84-202) Drainage of Highway Pavements*.

603.05 CULVERTS

- 603.05.A** Culverts shall be designed to convey the required storm event from the entire contributing area and shall be designed to pass the required flows without compromising public safety or causing new or additional flooding. Culverts shall be minimum 12 inches in diameter for driveways and minimum 18 inches in diameter for crossings of street rights-of-way.
- 603.05.B** Culverts that convey flows from or through natural creeks, streams, flood hazards or other sensitive areas, or as otherwise deemed appropriate by the City Engineer, shall be designed to convey the 100-year frequency flow.
- 603.05.C** Water crossing structures on all creeks and tributaries shall be constructed and maintained so as to not impede or eliminate a native fish species' access to habitat or ability to migrate. Proposed culvert crossings, regardless of tributary size, intermittent or perennial, shall conform to Oregon Department of Fish & Wildlife and National Marine Fisheries Service's regulations and stream crossing guidelines.
- 603.05.D** Culvert headwater water surface elevations shall not exceed 1.5-times the culvert diameter or shall remain at least 1-foot below the roadway subgrade, whichever is less.



603.05.E Culverts shall be designed in accordance with the most current version of the FHWA HY-8 software or other design software as approved by the City Engineer.

603.06 BRIDGES

603.06.A New and replacement bridges over natural perennial channels shall be designed to pass the 100-year peak discharge from the tributary area assuming full development. Unless approved otherwise, vertical clearance between the design water surface and the bottom of any part of the bridge shall be a minimum of 2-feet or 25 percent of the mean channel width between ordinary high water marks at the crossing, whichever is greater. Bridge hydraulics shall be designed in accordance with the most current version of the *ODOT Hydraulics Manual* or other design manual as approved by the City Engineer.

603.07 ENERGY DISSIPATORS

603.07.A Energy dissipators shall be designed in accordance with the most current version of the *ODOT Hydraulics Manual* or other design manual as approved by the City Engineer.

603.08 FLOODPLAIN INFORMATION

603.08.A Floodplain information, delineating the floodway and 100-year floodplain limits, shall be shown where it occurs within the development. Floodplain limits shall be based on maps prepared by the Federal Emergency Management Agency (FEMA). Where better information is available, it shall be used. The Design Engineer is cautioned about placing fill material or obstructions within the delineated floodplain limits.



604 ALIGNMENT AND COVER

604.01 RIGHT-OF-WAY LOCATION

- 604.01.A Storm drain systems shall be located in the street right-of-way and shall generally be located 5-feet south or west from right-of-way centerline as shown in the Standard Drawings. Any deviations will be reviewed on a case-by-case basis and will require City approval.
- 604.01.B Curved alignments in stormwater systems, vertically or horizontally, are not permitted.
- 604.01.C All changes in direction and size of pipe shall be made at an approved structure.
- 604.01.D Under normal conditions, storm drains shall be on the low side and on the south and west sides of the street, except when inlet locations warrant otherwise. Piping between inlets and storm drain lines shall be at near right angles to the street and other utility lines. All exceptions shall be reviewed on a case-by-case basis for approval.
- 604.01.E Where storm drains are being designed for installation parallel to other utility pipe or conduit lines, the vertical location shall be in such a manner that will permit future side connections of storm drains and avoid conflicts with parallel utilities without abrupt changes in vertical grade of main or lateral storm drains. A minimum separation of 5-feet clear distance shall be maintained between storm drain lines and all other public utilities.
- 604.01.F Where approved by the City Engineer, public storm drains serving a master planned development, apartment complex, or commercial/industrial development shall be in parking lots, private drives, or similar open areas that will permit an unobstructed vehicle access for maintenance.

604.02 MINIMUM COVER

- 604.02.A Storm drains shall be at a minimum depth of 4-feet or greater below the finish grade elevation. Minimum pipe depth shall be measured between the finished surface grade at the centerline of the storm drain and the top of storm drain pipe. Storm drains at depths less than this create problems with water line crossings, sewer lateral crossings, and proper cover over the pipe per manufacturer's recommendations. Fill may be required on development sites to maintain adequate cover over storm drain lines.
- 604.02.B In locations where flat terrain limits the extension of storm drains, the City Engineer may allow some pipeline configuration changes as well as alternate pipe cover depths in conjunction with site filling. Storm drain pipes with depths less than 4-feet, where allowed by the City Engineer, shall be connected from catch basin to catch basin in lieu of the use of manholes. Special pipe material such as ductile iron pipe or reinforced concrete pipe (down to 24-inches of cover) will be required.
- 604.02.C In areas of flat terrain, the Design Engineer shall show that sufficient depth is provided at the boundary of the development to properly drain the remainder of the upstream basin area tributary to the site or that other drainage options are available to the upstream property.

604.03 SEPARATION FROM WATERLINES

- 604.03.A Storm drain lines shall be installed a minimum clear distance of 5-foot horizontally from water mains and shall be installed to go under such waterlines with a minimum of 6-inch of vertical clearance at



the crossing of these pipes. Exceptions shall be approved by the City Engineer. In all instances the distances shall be measured surface to surface.

604.04 ACCESS AND UTILITY EASEMENTS

604.04.A When, in the Design Engineer's opinion, it is impractical to locate storm drains in rights-of-way, the storm drain shall be placed in an easement, as approved by City Engineer. Public utility easements granted to the City shall be perpetual easements and shall conform to the requirements of Section 102.08, except as noted below.

1. Open channels shall have easements sufficient in width to cover the 100-year floodplain line when a 100-year design storm is required, or 15-feet from the waterway centerline, or 10-feet from the top of the recognized bank, whichever is greatest. In addition, a 15-foot wide access easement shall be provided on both sides of the channel for channel widths greater than 14-feet at the top of the recognized bank.



605 STRUCTURES

605.01 MANHOLES

605.01.A GENERAL

1. Manholes shall be located at all changes in pipe slope, grade, alignment, size, type, and at all pipe junctions with present or future storm drain lines. A manhole shall be placed at the upstream end of each mainline, 7-feet maximum from property line to centerline of manhole.
2. Manhole spacing shall not exceed 400-feet. Deviation from this standard will be considered based on whether or not flushing, cleaning, and CCTV inspection equipment can adequately service the proposed spacing.
3. For ease of maintenance and inspection, manholes shall be installed within the street right-of-way. If a manhole must be located outside of the street right-of-way, access to the manhole shall be provided by means of an easement having a width consistent with Section 102.08. The easement shall be complete with an all-weather driveable surface from the adjacent public street to the manhole. The driveable surface shall extend to a point at least 10-feet beyond the manhole for equipment access.
4. Where practical, manholes shall be located at street intersections and shall be located outside the normal wheel travel lanes. Manhole lids are not permitted within designated existing or future bike lanes. Manholes shall not be placed in curbs or gutters or behind curbs. Manhole lids shall have a minimum of 12-inches of clearance from the edge of a curb and gutter.
5. Manholes located in unimproved areas shall have their lids positioned approximately 1-foot above the surrounding grade and be marked with City approved metal marker post. Manholes located in backyards, side lots, or otherwise substantially outside of the traveled right-of-way, may require tamperproof, locking lids. For public lines in easements within parking lots or other similar traveled areas, locking lids will generally not be required. In all areas prone to ponding, flooding, or along stream corridors, and in all areas below the 100-year flood plain, waterproof covers shall be installed. These types of manhole locations should be avoided whenever feasible and practical. Non-standard locations will require review by the City on a case-by-case basis.
6. Two manholes shall be provided for locations where the horizontal angle between the outgoing storm drain and the incoming storm drain will be less than 90 degrees. This is intended to prevent stormwater from discharging into the oncoming flow of an opposing storm drain.
7. Where internal system overflows may occur and covers are intended to prevent such overflows, the manhole cone and cover shall be designed to resist the resulting hydrostatic forces and be provided with vent piping. Vent piping configuration and cone and cover restraint will be reviewed by the City on a case-by-case basis.
8. Tee connections in storm lines will not be allowed (with the exception of private service lateral connections), unless otherwise approved by the City Engineer. Private connections to the public system will be reviewed on a case-by-case basis.
9. Standard inlets will not be allowed in lieu of manholes in any system.



605.01.B DROP THROUGH MANHOLES

1. Standards for elevation differences at manholes have been established to compensate for normal energy losses and to prevent surcharging of the storm drain system. For purposes of slope calculation and for establishing elevation differences, the elevations are given at the theoretical horizontal intersection of the storm drain centerlines (usually the center of the manhole). The rules for elevation differences at manholes are:
 - a. Where the pipe size decreases upstream through the manhole, the upstream pipe crown shall match the elevation of the crown of the downstream pipe. Where grade is limited, matching 0.8 of the pipe diameters may be used. If the incoming and outgoing pipes are of equal size and are passing straight through the manhole, the invert elevation difference shall be at least 0.10-feet. Manhole channels shall meet the requirements of the Standard Construction Specifications.
 - b. If the pipe alignment changes at the manhole, the invert elevation difference shall be at least 0.10-feet for 0 to 45 degrees of horizontal deflection angle, and 0.20-feet for 45 to 90 degrees of horizontal deflection angle. Horizontal deflection angles of greater than 90 degrees are not allowed. New piping, which is to be connected to existing manholes, shall generally adhere to these same hydraulic considerations. Existing concrete channels within the manhole shall be modified accordingly.
 - c. Pipes entering manholes may have a maximum free fall of 3-feet as measured to the invert of the manhole base, unless otherwise approved by the City Engineer. Larger pipelines shall be introduced into the manhole at the manhole invert.
2. Connections must enter the manhole through a channel in the base. This includes drop connections and connections to existing manholes.

605.01.C MANHOLE STANDARD DRAWINGS

1. All manholes shall have a minimum inside diameter of 48-inches and shall be in compliance with the Standard Construction Specifications. Manhole to piping connections shall be made with watertight, flexible manhole/pipe rubber connectors, as shown in the Standard Drawings.
2. The manhole Standard Drawings are suitable for most conditions. New designs or revisions should not be shown on the construction plans unless the Standard Drawings are not suitable. New or revised designs may be necessary if:
 - ❖ One or more of the sewers to be connected to the manhole is over 27-inches in diameter. (smaller diameters may require a special design if the manhole is at an alignment change)
 - ❖ Several sewers will be connected to the manhole.
 - ❖ There is less than 90 degrees between the incoming and outgoing sewer.
 - ❖ The manhole will be subject to unusual structural loads.
 - ❖ Diversion or other flow control measures are required.
3. If a special design is required for any reason, it will be necessary to show that design on the construction plans and to provide the City Engineer with structural calculations if so requested.
4. Some alternate manhole features are shown in the Standard Drawings. Where these features are required, they shall be specified by a note on the construction plans. Some examples are:



- ❖ Slab tops shall be used in lieu of cones where there will be less than 5-feet between the invert of the outlet pipe and the top of the manhole lid.
- ❖ Watertight manhole frames and covers shall be used if floodwaters are expected to cover the manhole top or if the manhole must be located in the street gutter. Such conditions should be avoided wherever feasible.
- ❖ Tamperproof manhole frames and covers are required in all areas outside the paved public right-of-way.

605.02 INLET MANHOLES

605.02.A Where stormwater systems connect to the existing or proposed public stormwater system at an inlet location, inlet manholes will be required where any of the following apply, unless otherwise approved by the City Engineer:

- ❖ The pipe connection is larger than 6-inches in diameter.
- ❖ Two (2) or more pipes discharge to the location.
- ❖ The design peak flow from the onsite system exceeds 0.5 cubic feet per second..

605.02.B The inlet manhole shall be designed in accordance with the most current edition of the *Hydraulic Engineering Circular No. 22 (FHWA-TS-84-202) Drainage of Highway Pavements*.

605.03 INLETS (SIDE-INLET CATCH BASIN AND CURB INLETS)

605.03.A Inlets may be connected together (maximum of three (3) inlets) at intersections to minimize the number of pipe crossings of the streets and number of manhole penetrations required. Inlet piping shall be connected to the storm drain system at manholes.

605.03.B Inlets shall be spaced to assure that the flow in the streets can be intercepted and no ponding in the street occurs during the design storm. However, the maximum total length of curb and gutter that may be drained by a curb inlet is 400-feet.

605.03.C The width of gutter flow on all street classifications shall not exceed 8-feet from face of curb or 3-inches in depth measured at the curb face for a 10-year design storm at any point along the street. Inlets shall be designed to completely intercept the 10-year design storm gutter flow. However, sag vertical curves in major collectors and arterials shall be designed to intercept the 50-year design storm. The 100-year design storm shall be evaluated, and provisions shall be provided, at all locations where ponding to hazardous depths are likely to occur.

605.03.D Inlet locations shall be coordinated with other design features such as sags, driveways, crossroad intersections, pedestrian crosswalks and handicap ramps, and interception points for concentrated flow from sources outside the pavement. Inlets shall not be placed in locations that may be objectionable to residents or interfere with other construction elements along the street. Avoid inlets directly in front of store fronts or pedestrian handicap ramps. Exceptions will be considered on a case-by-case basis.

605.03.E Inlets shall be located at the following locations, but in no case be spaced further than 400-feet:

- ❖ At curb returns on the upstream side of an intersection.
- ❖ At the ends of all dead-end streets with a descending grade (both gutters).
- ❖ At intermediate locations so that flows for the required storm event at the curb line do not exceed 8-feet in width (measured from the curb face) or 3-inches in depth (measured at the curb face), whichever is less.
- ❖ At the upstream end of the street improvements that abut unimproved roads or undeveloped property.



- ❖ At the downstream end of the street improvements that abut unimproved roads or undeveloped property.
- ❖ At superelevation transitions, 10 feet before the point where the street cross slope begins to super-elevate toward the opposite side to prevent cross street flow.
- ❖ As required by the City Engineer.

605.03.F Two inlets, or a single unit double inlet, are required at low point (sag) of all vertical curves, unless otherwise approved by the City Engineer.

605.03.G Runoff from side drainage, such as parking lots, usually enters the street at a specific location. An inlet shall be placed downstream of this point when gutter capacity is inadequate. If there are ditches behind the curb and gutter, area inlets shall be provided in the ditch to intercept flows from offsite.

605.03.H After the project inlets have been preliminarily placed in the proposed plan, the Design Engineer shall perform a complete inlet spacing analysis. The analysis begins at the upper most inlet in the drainage basin and the quantity of flow in the street is calculated. This calculated runoff is the sum of the street runoff and side drainage runoff reaching the inlet. The inlet is then moved uphill or downhill, changing the drainage area until the computed runoff equals the street capacity within allowable water spread width.

605.03.I Inlets shall be designed in accordance with the most current edition of the *Hydraulic Engineering Circular No. 22 (FHWA-TS-84-202) Drainage of Highway Pavements*.

605.04 SURFACE DRAINAGE INTERCEPTION (DITCH INLETS AND AREA DRAINS)

605.04.A Ditch inlets or area drains shall be provided wherever a surface drainage (creek, ditch, swale, or ponding areas) is intercepted and placed into a piped system. The ditch inlet or area drain shall be concrete and shall have removable grating covering the inlet. See Standard Drawings. The ditch inlet grate shall have the bars oriented in the vertical direction.

605.04.B The invert of the ditch inlet or area drain shall be at or below the invert of the drainage being intercepted. The inlet shall be designed to accommodate the anticipated peak flows of the surface drainage at the design storm.

605.04.C Special attention shall be paid to where water will accumulate and flow, should the inlet become clogged or blocked. In sensitive areas, accommodations for overflows caused by inlet clogging shall be made such that the overflow does not damage downstream areas.

605.05 SLOPE INTERCEPT DRAINS

605.05.A Slope intercept drains shall be provided at the following locations:

1. Along the upper boundaries of a development where the natural ground slope exceeds 10 percent to intercept drainage from the tributary area above the site.
2. Along the lower boundary of a development where the natural ground slope exceeds 10 percent to prevent drainage onto a lower tributary area other than by means of an approved point of disposal.
3. Along the top of all cuts that exceed 4-feet with cut slopes that exceed 2:1 where the tributary drainage area above the cut slopes towards the cut and has a drainage path greater than 40-feet, measured horizontally.



605.06 SUBSURFACE DRAINAGE INTERCEPTION

605.06.A Subsurface drains (underdrains) shall be provided at the following locations:

1. Cut and fill slopes in excess of 4-feet for stability, except when a soils report submitted by a registered professional engineer experienced in soils certifies they are not required.
2. Existing springs or springs intercepted during construction activity for other facilities, i.e., sewer, water mains, or street excavations.
3. Where high ground water exists or when it is necessary to reduce the piezometric surface to an acceptable level to prevent land slippage or underfloor flooding of buildings.

605.06.B The drainage line installed shall begin at a cleanout and terminate at an approved point of discharge. Open-jointed storm drain lines will not be considered as an acceptable solution.

605.07 OUTFALLS TO SURFACE DRAINAGE CHANNELS

605.07.A GENERAL

1. Storm drain lines shall enter a creek or drainage channel at 90 degrees or less to the direction of flow. The outfall shall have a head wall and scour pad or rock protection to prevent erosion of the existing bank or channel bottom in accordance with Subsection 605.08 and as approved by the City Engineer. Outfall structures for pipes of 24-inches in diameter or greater shall have grating covering the outlet. The grate shall have the bars oriented in the vertical direction. Outfall grates shall be attached to the outlet structure with a hinged connection at the top of the grate.
2. The outfall shall not intrude into the channel and reduce flow capacity of the channel. Pipe ends shall be beveled to match the side slope of the channel. Energy dissipation measures and armament of the channel bank are required at the outfall. The size of the receiving facility will govern what protective measures are required. Backflow valves may be required on outfall structures to prevent backwater from surcharging and flooding the new storm drain improvements.
3. Outfall rock protective measures shall conform to the requirements of Section 605.08.

605.07.B STEEP SLOPES

1. Outfalls proposed on slopes greater than 15 percent or greater than 20-feet in height must meet one of the following criteria:
 - a. The discharge must be less than 0.5 cubic feet per second.
 - b. A tight-line conveyance system shall be constructed to convey the runoff to the bottom of the slope with adequate energy dissipation at the bottom to protect the toe of the slope and/or the receiving watercourse from erosion.

605.08 OUTFALLS AND BANK PROTECTION

605.08.A Any new outfall into the Salem Ditch, Stayton Ditch, Power Canal, and Main Canal requires written approval from the Santiam Water Control District.

605.08.B The outfalls of all stormwater systems shall be adequately protected to prevent erosion of slopes and channels. Outfalls shall be designed in accordance with the most current edition of the *ODOT Hydraulics Manual* or the *City of Portland Stormwater Management Manual*.



606 SURFACE DRAINAGE

606.01 GENERAL

606.01.A For purposes of these Design Standards, surface drainage routes will be classified according to two general categories: constructed watercourses and natural creeks.

1. Plan requirements for surface drainage courses shall include the requirements previously specified in Subsection 602.02 and the following supporting data and calculations:
 - a. Profile of the channel showing the existing flowline and top of bank, proposed flowline and top of bank, and design water surface profile (backwater curve).
 - b. A minimum of three (3) cross sections of the existing channel adjoining or crossing the property taken at the upstream, midsection, and downstream boundaries of the property. More sections may be required depending on the length of the reach and existing channel alignment.
 - c. Calculations for arriving at the design flow rate. Analyze the proposed system and show that the channel cross section after improvement will pass the design storm with 1-foot of freeboard to the top of bank. For channels shown on the F.I.R.M. maps, show that the channel cross section after improvement will pass the base flood at or below the 100-year flood elevation shown on the F.I.R.M.
 - d. A storm drain easement sufficient in width shall be provided to cover the 100-year Floodplain Line when a 100-year design storm is required or 15-feet from the top of the recognized bank, whichever is greater.
2. Access roads shall be provided when required by the City Engineer and shall meet the requirements set forth in Section 608.05.D.

606.02 CONSTRUCTED WATERCOURSE REQUIREMENTS

1. Constructed watercourses shall be designed with a "natural" curved alignment with a variable side slope not to exceed 3H:1V, except that in tight spots created by existing natural features (e.g., boulders, large trees, etc.) where the slope can be 2.5H:1V until the natural feature is bypassed or where steeper slopes are needed and do not impair the hydraulic efficiency of the waterway. The watercourse shall include a low flow channel as described below and will be reviewed on a case-by-case basis for approval.
2. The bank shall be designed with a minimum of 1-foot of freeboard above the maximum water surface elevation with a minimum top of bank width of 6-feet. A larger width shall be provided when required by the City Engineer for maintenance purposes. The backslope of the bank shall not exceed 3H:1V, unless otherwise approved by the City. The existing ground adjacent to the toe of the bank backslope shall be graded to slope away at 2 percent to prevent water ponding at the backslope toe.
3. Design shall be curvilinear with a 100-foot minimum radius. Tighter curves may be used if the City Engineer determines that sufficient erosion control has been incorporated into the design to maintain stable bank conditions following development.



4. A low flow channel shall be designed to carry a 2-year design storm or the normal low water flow of a year-round creek, whichever is greater. Low flow channel slopes shall not exceed 3H:1V and shall be stabilized to the satisfaction of the City Engineer. In general, bank stabilization will be required in any channel with a design flow velocity in excess of 3-feet per second.
5. Capacity of channels shall be determined by the Manning Formula. The minimum value for "n" shall be 0.033 for maintained grass-lined swales and shall be 0.035 for channels with rock-lined and/or unmaintained bottoms, unless otherwise approved by the City Engineer. A greater value of "n" shall be used for the capacity analysis when required by the City Engineer.
6. Channel sides and bottoms shall be seeded, sodded, or rock lined immediately following construction. Bank stabilization measures shall be designed and included in the construction plans.
7. Points of discharge from culverts and storm drains into ditches and swales shall be rock lined with riprap. Riprap shall extend for a distance of 10-feet minimum from the point of culvert or storm drain discharge and shall have a minimum width 3-feet in excess of the diameter of the culvert or storm drain. Special energy dissipaters may be substituted for riprap at the discretion of the City Engineer.

606.03 NATURAL CREEK REQUIREMENTS

606.03.A GENERAL

1. For the purposes of these standards "Natural Creek" shall include, North Santiam River, Mill Creek, Lucas Ditch, Salem Ditch, Stayton Ditch, Power Canal, and Main Canal.
2. A permit shall be obtained from the Division of State Lands and the Department of Fish and Wildlife for all work between the creek banks.

606.03.B CREEK CLASSIFICATION

1. Creeks in Stayton are classified as salmon-producing creeks or other natural creeks in Chapter 3 of the 2013 Comprehensive Plan Update. No in-stream work will be allowed in salmon producing creeks during the months of September or October. The intent is to minimize sediment production in these creeks during critical salmon spawning season.

606.03.C SALMON-PRODUCING CREEK REQUIREMENTS

1. In addition to the other natural creek requirements listed below, the following requirements shall be met in salmon-producing creeks. These are not in replacement of the requirements for natural creeks, but in addition to them.
 - a. Creek bed alterations shall provide diversified habitats for a variety of creek organisms and a pleasing appearance. Creek bed alternations shall be as approved by the regulatory agency and the City Engineer on a case-by-case basis based on the following provisions:
 - 1) Sufficient water depth to support fish and other aquatic life during low flows.
 - 2) Diversity of water velocities through the use of pools and riffles.



- 3) A meandering channel to facilitate 1) and 2) above.
- 4) Sufficient creek bed gradient to provide adequate flow velocities.
- b. Creek bed gravel shall be well rounded rock in the following gradations (with larger rock in sufficient quantity to provide adequate riffing) and shall be as approved by the regulatory agency and the City Engineer:
 - 1) Mill Creek – Approximately 15 percent, 3"-6".
- c. Creek banks and sides shall be designed and constructed so as to provide stability, adequate shading, and cover for fish and other aquatic life, to the approval of the regulatory agency and the City Engineer. Shading shall be provided by plantings of appropriate types and sufficient quantities per these Design Standards. Creek bank designs and vegetation restoration plans shall be as approved by the regulatory agency and the City Engineer on a case-by-case basis.
- d. Vertical creek banks (walls) should be avoided whenever possible; as such a creek channel configuration decreases the creek carrying capacity and increases in-creek velocities during high flows (depending on bottom width provided).
- e. Creek work and channel design shall include a construction sequence list designed primarily to control erosion and also to facilitate the planned construction. The construction sequence may be modified by the City Engineer during the construction as field conditions warrant.
- f. Vegetation disturbance shall be minimized and creek banks revegetated with appropriate native vegetation to provide shading for the creek.
- g. Bank protection using large diameter rock (riprap) is not permitted by regulatory agencies and natural organic protection, such as root balls, log jams, and bio-engineered lining, shall be used. Regulatory agency approval of the design will be required.

606.03.D OTHER NATURAL CREEK REQUIREMENTS

1. Natural creeks shall be preserved and all work in and adjacent to creeks shall incorporate both temporary and permanent erosion control measures to protect disturbed areas from erosion and damage. No alteration will be permitted that reduces the overall creek capacity.
2. Creek channel design and construction practices shall be such that the cumulative incremental effects of creek work considered alone or together with existing or similar projects in the vicinity will not result in substantial damage to existing waterways and surface waters by erosion, siltation or sedimentation, significant changes in stormwater quality, increased downstream water velocity, significant harmful deterioration of groundwater drainage, or significant deterioration of aquatic wildlife habitat.
3. Creek construction, relocation, and/or reconstruction may be approved if the City Engineer determines that such a proposal will result in an overall benefit to or maintenance of a surface water system of equal quality in terms of water quantity and quality control and the Developer can obtain the appropriate State and Federal permits.
4. Any and all stream work shall be consistent with the floodplain management policies and regulations and as set forth in Stayton Municipal Code.



606.04 CHANNEL PROTECTION

606.04.A Open channels shall be designed to prevent scouring of the channel. Use of riprap on any channel will be reviewed by the City Engineer on a case-by-case basis. Bio-engineering lining may be required. In addition, regulatory agency approval of the design may be required.

606.04.B Channel protection shall be designed in accordance with the most current edition of the *ODOT Hydraulics Manual*.



607 STORMWATER QUALITY (POLLUTION CONTROL) FACILITIES

607.01 GENERAL

607.01.A Stormwater management facility designs within the City of Stayton shall comply with the most current edition of the *City of Portland Stormwater Management Manual (SWMM)*, except as specifically excluded or modified by these Design Standards, or as specifically approved by the City Engineer. **The City of Portland SWMM facility designs that are not allowed are:**

- ❖ Ecoroofs
- ❖ Tree Credits;
- ❖ Drywells; and
- ❖ Sumps

The City of Portland SWMM facility designs that are not allowed unless specifically approved by the City Engineer on a case-by-case basis are:

- ❖ Pervious Pavements; and
- ❖ Soakage Trenches

The use of any other resource shall be coordinated with and approved by the City Engineer prior to design. All stormwater quality facility setbacks shall also comply with the *City of Portland SWMM*, unless otherwise approved by the City Engineer. All setback requirements are minimums and can be increased, as required by the City Engineer.

607.01.B Development and any other activities which create new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, are required to construct or fund permanent stormwater quality facilities to reduce contaminants entering the storm and surface water system. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quality requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite.

1. Some site characteristics and uses may generate specific pollutants of concern or levels of pollution that are not addressed solely through implementation of the pollution reduction requirements. The *City of Portland Stormwater Management Manual (SWMM)* defines these characteristics and uses and identifies structural source controls that must be implemented to manage the pollutants at their source (see City of Portland SWMM Chapter 4, Source Controls). The City of Stayton requires that **any project of any size** that introduces these site characteristics or uses must comply with the City of Portland SWMM source control requirements. This includes development, tenant improvements, and changes to site uses or activities, including changes to specific site or activity areas, even if no impervious area is added or replaced.

607.01.C The purpose of stormwater quality facilities is to reduce the pollutants associated with stormwater runoff from new development. By establishing criteria, the City is satisfying federal regulatory requirements to control the discharge of pollutants into stormwater as specified in the Clean Water Act Amendments of 1987 and its National Pollutant Discharge Elimination System (NPDES) permit for discharges from a municipally owned and operated separate storm sewer system issued by the Oregon Department of Environmental Quality (DEQ) under authority of the United States Environmental Protection Agency (EPA).



607.01.D It is the responsibility of the Developer(s) to meet stormwater treatment requirements for their particular development. While there have been significant advances in the field of stormwater treatment technologies, the stormwater quality program still requires a best effort attempt at installing facilities that will address the commonly predictable stormwater problems of a development.

607.02 MINIMUM DESIGN CRITERIA

607.02.A The stormwater quality facilities shall be designed to remove 70 percent of the total suspended solids from 90 percent of the average annual runoff in accordance with the most current edition of the *City of Portland Stormwater Management Manual*.

607.02.B The total suspended solids removal efficiency specifies only the design requirements and is not intended as a basis for performance evaluation or compliance determination of the stormwater quality control facility installed or constructed pursuant to this document.

607.02.C If an onsite stormwater quality facility cannot be constructed to treat the runoff from the development's impervious surface, then with City approval, an on- or off-site stormwater quality facility may be designed to treat runoff from an equivalent area of adjacent untreated impervious surfaces.

607.02.D Facilities shall be designed such that flow from the development is treated off-line from the storm conveyance system and reconnected to upstream flows following treatment. If an off-line facility is not feasible, additional capacity may be required for upstream flow.

607.02.E Discharges to sensitive areas shall maintain the pre-development flow rate to the extent necessary to protect the characteristic functions of the sensitive area.

607.02.F Stormwater quality facilities shall be constructed as part of the public improvements.

607.02.G Stormwater quality facilities shall be designed to address the Willamette Basin TMDL pollutants of mercury, temperature, and bacteria.

607.02.H Other design options for meeting this section may be considered by the City for approval.

607.03 ON-SITE FACILITIES

607.03.A A stormwater quality facility shall be constructed on-site and be above ground/open surfaced, unless otherwise approved by the City Engineer. A stormwater quality manhole shall be located upstream of vegetated stormwater facilities, unless otherwise approved by the City Engineer.

607.04 IMPERVIOUS AREAS

607.04.A The sizing of stormwater quality facilities shall be based on the impervious area created by the development and for all existing contributing impervious areas proposed to remain on site, including but not limited to roofs, structures, roads, developed open water surface areas, and other impervious areas. Impervious areas shall be determined based upon building permits, construction plans, or other appropriate methods of measurement as approved by the City Engineer.

607.04.B The City encourages design initiatives that reduce effective impervious area.

607.05 OPERATION AND MAINTENANCE PLAN AND AGREEMENT

607.05.A An operation and maintenance plan and agreement shall be submitted for City review and approval for all stormwater quality facilities. The O&M Plan shall include types and frequencies of operation and maintenance activities and shall comply with the most current edition of the *City of Portland Stormwater Management Manual*.



608 STORMWATER QUANTITY (FLOW CONTROL) FACILITIES

608.01 GENERAL

608.01.A Stormwater quantity facility designs shall comply with the most current edition of the *City of Portland Stormwater Management Manual (SWMM)*, except as specifically excluded or modified by these Design Standards or as approved by the City Engineer. **The *City of Portland SWMM* facility designs that are not allowed are:**

- ❖ Ecoroofs;
- ❖ Tree Credits;
- ❖ Drywells; and
- ❖ Sumps

The *City of Portland SWMM* facility designs that are not allowed unless specifically approved by the City Engineer on a case by case basis are:

- ❖ Pervious Pavement; and
- ❖ Soakage Trenches

608.01.B The use of any other resource shall be coordinated with and approved by the City Engineer prior to design. All stormwater quantity facility setbacks shall also comply with the *City of Portland SWMM*, unless otherwise approved by the City Engineer. All setback requirements are minimums and can be increased, as required by the City Engineer.

608.01.C Development and any other activities which create new impervious surfaces of greater than **500-square feet** in area at the time of application, or if required by the City Engineer, shall incorporate stormwater quantity facilities for mitigating its impacts on the public stormwater systems and receiving water bodies. Properties with existing development that propose new offsite discharges or new connections to the public system that meet this threshold must also comply with the stormwater quantity requirements. Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite.

608.01.D Unless directed otherwise, stormwater quantity facilities will be required to detain post-developed peak runoff rates from the 2-year, 5-year, 10-year, 50, and 100-year 24-hour storm events to the respective pre-developed peak runoff rates, and the post-developed peak runoff rate for the 25-year storm event will be required to be detained to the 10-year pre-developed peak runoff rate (required release rates). Potential downstream damage due to stormwater quantity facility system failure/overflow may require greater detention requirements or improvements downstream. In no case shall the required release rates increase the flooding conditions downstream.

608.01.E All stormwater quantity and infiltration facilities shall have emergency overflow (auxiliary outlet) provisions incorporated into the design. Flow capacity of the overflow shall be calculated and shown as supporting information. The emergency overflow must be designed to accommodate the undetained post-developed 100-year 24-hour storm event peak flows. Emergency overflow spillways shall be located in existing soils when feasible and armored with riprap or other approved erosion protection extending to the toe of the embankment.

608.01.F Storm drainage runoff originating from and/or draining to any proposed development shall be controlled and/or conveyed in accordance with all City Standards and Policies as described in these Design Standards. When existing conditions make storm drainage detention impossible for a portion of a site, the City Engineer may permit compensatory storage volume to be provided on another



portion of the site, provided the total site area is tributary to one drainage basin both prior to and after development. In no case shall the runoff rate from the total site exceed the allowable release rate.

- 608.01.G** Under some specific situations, detention requirements may be waived and direct discharge may be allowed, as determined by the City Engineer. Direct discharge will not exclude the use of erosion control or other stormwater quality control techniques within the development.
- 608.01.H** The storm drainage system must be properly designed to handle all flows developed on-site and all flows that flow through the site from upstream. Designers should conceptualize how water will move into, through, and out of the system, looking for such potential problems as flow impediments, construction difficulties, future maintenance problems, and soil erosion potential.
- 608.01.I** Public health, safety, maintenance, nuisance abatement, and vector control must be carefully reviewed in every drainage control system plan. Protective measures are often necessary and will be required whenever appropriate. The protective measures themselves shall be designed so as not to constitute hazards or nuisances.
- 608.01.J** The impact of a system failure shall be analyzed both in terms of on-site and off-site effects. The impacts may be to adjacent properties, or to elements of the public drainage system or other private systems. The downstream consequences of failure of a detention facility shall be included in determining location and design parameters.
- 608.01.K** The frequency and difficulty of future maintenance can be minimized by thorough consideration during design of what could possibly go wrong in the system and what would be required to correct the problem. Facility design shall incorporate maintenance considerations to ease such problems.
- 608.01.L** The use of the site shall be evaluated to determine if hazardous materials or other pollutants are likely to be present, and if extraordinary design considerations are necessary. Construction of on-site detention will not be allowed if such a detention facility would have an adverse effect upon receiving waters in the basin or sub-basin in the event of flooding, or would increase the likelihood or severity of flooding problems downstream of the site.
- 608.01.M** The visual impact and other potential problems (mosquito breeding, smell, etc.) shall be minimized. Concerns will vary with the site environment, but aesthetics should always be of concern to the designer.
- 608.01.N** It is important that runoff from rooftops pass through the detention system; the design shall clearly indicate how roof runoff moves through the system.
- 608.01.O** Access, passable by a maintenance vehicle to all control structures by appropriate equipment, shall be provided with easements dedicated to the City.
- 608.01.P** Drainage plans shall include a plan and profile of the facilities. The profile requirement for private drainage systems may be waived at the discretion of the City Engineer when sufficient data is provided on the plan in a clear and concise manner including the following minimum hydraulic and physical data:
 - ❖ Grades, bottom elevations of ditches, channels, ponds and swales, parking lots and infiltration trenches;
 - ❖ Inverts of pipes;
 - ❖ Inverts and tops of all structures such as manholes, catch basins, chambers, or similar structures;
 - ❖ Design infiltration rates;



- ❖ Stage-storage curve with design and check storms shown for all detention facilities;
- ❖ Size, length, and slope of all pipes or other detention or conveyance facilities, including the invert elevations of the existing or any other storm drainage system that the subject drainage proposes to discharge into. Add a note indicating that all facilities shall be inspected prior to landscaping.
- ❖ Proposed seeding, vegetative covering and landscaping.

608.02 ON-SITE FACILITIES

608.02.A A stormwater quantity facility shall be constructed on-site and be above ground/open surfaced. Underground detention systems (pipe/vault) may be used where specifically approved by the City Engineer.

608.03 IMPERVIOUS AREA

608.03.A The sizing of stormwater quantity facilities shall be based on the impervious area created by the development and for all existing contributing impervious areas proposed to remain on site, including but not limited to roofs, structures, roads, developed open water surface areas, and other impervious areas. Impervious areas shall be determined based upon building permits, construction plans, or other appropriate methods of measurement as approved by the City Engineer.

608.03.B The City encourages design initiatives that reduce effective impervious area.

608.04 OPERATION AND MAINTENANCE PLAN AND AGREEMENT

608.04.A An operation and maintenance plan and agreement shall be submitted for City review and approval for all stormwater quality facilities. The O&M Plan shall include types and frequencies of operation and maintenance activities and shall comply with the most current edition of the *City of Portland SWMM*.

608.05 ABOVE GROUND DETENTION FACILITIES

608.05.A GENERAL

1. Interior slopes of detention facilities shall not exceed 3-feet horizontal to 1-foot vertical (3H:1V) for all detention facilities in public developments, master planned developments, subdivisions, and land partitions unless otherwise approved by the City Engineer. Facilities in commercial, industrial, and multifamily developments that are to remain under private ownership and maintenance shall have at least one interior slope not exceeding 3H:1V with all other interiors exceeding 3H:1V to be either retaining walls designed by a licensed structural engineer or a design submitted by a licensed engineer experienced in soils mechanics. Detention facilities exterior slopes shall not exceed 3-feet horizontal to 1-foot vertical.
2. The maximum design water depth in all detention facilities shall be 4-feet. Facilities less than 3-feet shall have a minimum bottom dimension of 6-feet or as approved by the City Engineer. Facilities 3-feet to 4-feet deep shall have a minimum bottom dimension of 15-feet.
3. Facilities suited to multiple use are encouraged. Examples of multiple uses are sport courts, play areas, neighborhood parks, picnic areas, and athletic fields. Such facilities that will provide public access shall be designed with special attention to safety of the public during inundation of the facility. Side-slopes shall be very gradual to avoid the risk of someone slipping into the facility and not being able to walk out.



4. Facilities shall be landscaped so as to provide slope stability, water treatment, and pleasant appearance by utilizing sodding, seeding, and planting of trees and shrubbery. Under no circumstances will the use of easily floatable or erodible materials (such as "bark dust") be permitted in facility interiors.
5. Maintenance of surface facilities is the responsibility of the property owner(s) or owner's association. Maintenance of surface facility landscaping in single family residential areas and Master Planned Developments shall be the responsibility of an owner's association, unless otherwise accepted for maintenance by the City.

608.05.B STORMWATER QUALITY CONSIDERATIONS

1. Stormwater quantity facilities that will also be designed to address stormwater quality shall include the appropriate water quality volume (permanent pool or dead storage) as further required in the most current edition of the *City of Portland SWMM*.
2. The bottom of constructed and graded retention/detention facilities shall be sloped no flatter than 0.01 foot/foot (1 percent) towards the outlets for drainage unless otherwise approved by the City Engineer. **EXCEPTION:** This requirement need not apply to natural facilities, which exist and are utilized for stormwater detention.
3. Detention facilities shall have a well-defined low flow channel to contain runoff of lesser storms. Low flow channels shall be designed so as to enhance the facility landscaping and overall facility appearance.
4. Outlets of detention facilities shall be provided with suitable debris barriers designed to protect the outlet from blockage or plugging. Properly-sized overflow structures shall be designed into the facility.
5. The inlet and outlet structures shall be on opposite ends of the facility to promote maximum residence time and to prevent short-circuiting. Baffles may be required to be installed to increase the residence time and flow path if locating outlet structures on opposite sides of the facility is not practical.
6. Detention facilities shall be designed so that the "drawdown" time does not exceed 48 hours. In the event drawdown time exceeds 48 hours, additional calculations shall be submitted showing the proposed facility can contain an additional 25-year, 24-hour storm event.
7. The use of a sedimentation fore-bay will be required during the construction process if the facility is to be used for sedimentation control. After construction is complete, the facility shall be completely cleaned and any sediment shall be removed prior to connection to City infrastructure.

608.05.C OVERFLOW - EMERGENCY SPILLWAY

1. Detention facilities shall have a minimum of 1-foot of freeboard above the 100-yr maximum water surface elevation. The maximum water surface elevation will occur when the 100-yr storm event is being conveyed over the emergency spillway weir and will depend on the depth of water designed above the spillway. An analysis should be performed to review and verify emergency overflow water surface elevations.
2. A detention facility emergency overflow spillway shall be designed to adequately convey the 100yr, 24-hr design storm event for the undetained post-developed conditions, assuming the



detention facility is full to the overflow spillway or structure crest. Emergency overflow spillway weir calculations, sections, and details shall be provided for review. The design shall provide controlled discharge directly into the downstream conveyance system. An emergency overflow spillway (auxiliary outlet) shall be provided in accordance with the most current edition of the *City of Portland Stormwater Management Manual* to safely pass emergency overflows in the event of control structure failure and for storm/runoff events exceeding design. The spillway shall be located to direct overflows safely towards the downstream conveyance system. The emergency spillway shall be located in existing soils when feasible and shall be armored with riprap or other approved erosion protection extending to the toe of each face of the berm embankment.

608.05.D ACCESS - MAINTENANCE

1. City-maintained detention facility control structures not abutting a public right-of-way shall be accessible to the City for maintenance and operation. Access roads and easements shall be provided to accommodate vehicular traffic year-round to both sides of the facility as necessary for vehicular maintenance access. Control structures shall be designed to operate automatically as much as possible.
2. A vehicular access shall be provided to the bottom of the detention facility when the bottom width of the facility is 20-feet or greater or when the height of the facility interior wall exceeds 5-feet.
3. Access roads shall meet the following criteria:
 - ❖ A maximum grade of 15 percent and a maximum cross slope of 3 percent.
 - ❖ A 40-foot minimum outside turning radius.
 - ❖ A minimum width of 15-feet.
 - ❖ Access roads in excess of 50-feet in length shall have a turn around.
 - ❖ The capability of supporting a 20-ton vehicle under all weather conditions.

608.05.E BERM EMBANKMENT - SLOPE STABILIZATION

1. Any embankment for a detention facility with berms 4-feet in height or less (3-feet maximum water depth), forming one or more sides of a retention/detention facility shall have a minimum 10-foot wide top of berm with a back slope not to exceed three (3) horizontal to one (1) vertical, unless otherwise approved by the City Engineer. Facility embankment shall be designed and the construction certified by a professional Civil Engineer licensed in the State of Oregon.
2. Any embankment for a detention facility in excess of 4-feet must be designed by a professional Geotechnical Engineer licensed in the State of Oregon and approved by the City Engineer. The geotechnical engineer shall design, inspect, and certify the construction such that the facility and earth berms are safe for the intended use. Notes to the effect of the above shall be shown on the plans submitted for approval. The minimum top width of the berm shall be 15-feet, unless otherwise approved by the City Engineer.
3. The toe of the exterior slope of facility berm embankment shall be no closer than 5-feet from the tract or easement property line.
4. The facility berm embankment shall be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a geotechnical engineer) free of loose surface soil materials, roots and other organic debris.



5. The facility berm embankments shall be constructed by excavating a 'key' equal to 50 percent of the berm embankment cross-sectional height and width or as designed by a geotechnical engineer.
6. Anti-seepage collars shall be placed on pipes in berm embankments which impound water greater than 3-feet in depth at the design water surface.
7. Exposed earth on the facility bottom and side slopes shall be seeded with seed mixture approved by the City Engineer.

608.05.F DETENTION FACILITY VOLUME

1. The design volume of the detention facility shall be shown on the plans, and the design volume shall be inspected after construction and verified by the Design Engineer to meet or exceed the stormwater report requirements, prior to landscaping (a note to this effect shall be shown on the plans).

608.05.G USE OF PARKING LOTS FOR DETENTION

1. Parking lots may be used to provide additional detention volume for runoff events greater than the 2-year storm event provided that:
 - ❖ The depth of water detained shall not exceed one (1) foot at any location in the parking lot for runoff events up to and including the 100-year storm event, AND
 - ❖ The gradient of the parking lot area subject to ponding shall be one (1) percent or greater, AND
 - ❖ The emergency overflow path shall be identified and noted on the engineering plan, and comply with all other development and drainage requirements, AND
 - ❖ Fire lanes used for emergency equipment shall be free of ponding water for all runoff events up to and including the 100-year storm event, AND
 - ❖ Buildings and parking lot utilities and facilities are not affected.

608.05.H USE OF ROOFS FOR DETENTION

1. Detention on roofs of structures may not be used to meet flow control requirements.

608.06 UNDERGROUND DETENTION FACILITIES

608.06.A GENERAL

1. City preference is to have stormwater runoff detention occur above ground. In select locations, the City may approve the use of underground detention facilities. Underground detention facilities may only be proposed once all other means of surface detention have been explored and exhausted, and are subject to the approval of the City Engineer. Underground detention facilities shall be designed by a professional Civil Engineer licensed in the state of Oregon, and shall only be used as a means of controlling stormwater quantity. Stormwater quality treatment measures by utilizing manufactured treatment devices may only be used when specifically approved by the City Engineer.
2. To minimize the occurrence of routine maintenance, all underground detention facilities shall be designed with a stormwater quality manhole (or equivalent) upstream, to facilitate sediment fallout prior to stormwater entering the detention facility. Incoming velocities shall be reviewed as to reduce the potential for sediment washout.



608.06.B FREEBOARD

1. Underground detention facilities shall be designed to provide adequate freeboard. Freeboard is measured as the vertical distance between the water surface and the rim of the auxiliary outlet or the inside top of the detention pipe or detention vault.
2. The following freeboard shall be provided:
 - ❖ DESIGN STORM EVENT – 6 inches from design storm high water elevation to the auxiliary outlet rim elevation (i.e. overflow riser pipe). The freeboard criteria apply to the highest intensity storm if there are multiple design storms.
 - ❖ 100-YEAR STORM EVENT – 6 inches from the 100-year storm event (check storm) high water elevation to the inside top of the detention facility. The water surface elevation for the 100-year storm event freeboard calculations is based on the entire flow passing through the auxiliary outlet (i.e. overflow riser pipe) and no flow through the primary outlet (i.e. orifice(s)).
3. The detention facility should have adequate venting to prevent pressure or vacuum as the water surface level rises or falls within the facility. This can be accomplished by having vented access cover over the facility or by connecting the top of the facility to a ventilated area with a pipe having a minimum diameter of 2 inches.

608.06.C DETENTION PIPE SYSTEMS

1. GENERAL
 - a. Detention pipes serve as runoff quantity control through the means of underground storage. In addition to runoff quantity control, detention pipes shall be designed for factors such as environmental conditions (soil corrosivity, inundation, etc.), maintenance access, and ground and/or surface loadings.
 - b. The minimum pipe size allowed for a detention pipe in the public drainage system shall be 36-inches in diameter.
 - c. Detention pipes shall be designed as flow-through systems, incorporating the use of in line manholes for maintenance and sediment removal.
 - d. Detention pipe bottoms shall be set at a minimum grade of 0.002-feet per foot.
 - e. City owned detention pipes shall be located in the right-of-way; detention pipes proposed to be located outside the public right-of-way shall be located in a public easement, dedicated to the City.
 - f. The outlet flow control structure and detention pipe shall comply with the Standard Drawings, unless otherwise approved by the City Engineer.
2. MATERIALS
 - a. Acceptable materials for City owned detention pipes in public rights-of-way or public easements are:
 - ❖ Reinforced concrete pipe.



- ❖ Solid wall HDPE.
- ❖ As approved by City Engineer

b. The following materials may be used for private systems located outside of public rights-of-way or public easements:

- ❖ Reinforced concrete pipe.
- ❖ Solid wall HDPE.
- ❖ Sanitite HDPE
- ❖ PVC pipe.
- ❖ As approved by City Engineer.

3. BUOYANCY

a. The effects of buoyancy shall be considered in areas with a known high groundwater table, or areas where seasonal high groundwater may cause flotation of the detention pipe.

b. Measures such as concrete anchors, concrete backfill, subsurface drains, etc. shall be required in these areas, as well as supporting engineered calculations.

4. STRUCTURAL STABILITY

a. Special consideration shall be given to ensure pipes meet requirements for potential traffic loading and overburden support. Access and structural end-cap bracing specifications from the manufacturer are required. Pipes shall be placed on stable, well consolidated native material or engineered fill with appropriate bedding. A structural analysis, geotechnical analysis, and engineered calculations may be required with the design, demonstrating stability and constructability. For pipes proposed under the traveled way, H20 live loadings shall be accommodated.

5. ACCESS MAINTENANCE

a. Access easements and roads shall be provided when pipes are not located within the public right-of-way.

b. Access openings shall be provided at a distance of no less than 100 feet from any location within the pipe, shall be a minimum of 36 inches in diameter, and shall have water-tight round lids. Additionally, access openings shall be located at both the inlet and outlet locations of the detention pipe. Improvements shall be made to facilitate maintenance equipment access to the maintenance access points year-round. Maintenance access point shall not be in areas that can be fenced off by private property owners.

c. Access openings shall have surface access for maintenance vehicles.

d. The distance from pipe invert to finished grade shall be not more than 15 feet, unless otherwise approved by the City Engineer.

e. OSHA confined space requirements shall be met for pipes, and entrances to confined spaces shall be clearly marked.

6. ACCESS ROADS

a. Access roads shall meet the requirements set forth in Section 608.05.D above.



608.06.D DETENTION VAULTS

1. GENERAL

- a. Detention vaults serve as runoff quantity control through the means of underground storage. Besides runoff quantity control, vaults shall be designed for considerations such as environmental conditions (soil corrosivity, inundation, etc.), maintenance access, and ground and/or surface loadings.
- b. Detention vaults shall be a box-shaped design constructed with reinforced concrete.
- c. Detention vaults shall be designed as flow-through systems with level bottoms.
- d. Ventilation pipes (minimum 1 foot diameter or equivalent) should be provided in all four corners of vaults to allow for ventilation for maintenance personnel. This is not required if removable panels are provided over the entire vault.
- e. City owned detention vaults shall be located in the right-of-way; detention vaults proposed to be located outside the right-of-way shall be located in a Public Utility Easement, dedicated to the City.

2. MATERIALS

- a. Detention vaults shall consist of minimum 3,300 psi structural reinforced concrete. Joints shall be constructed with water stops.

3. BUOYANCY

- a. The effects of buoyancy shall be considered in areas with a known high groundwater table, or areas where seasonal high groundwater may cause flotation of the detention vaults.
- b. Measures such as concrete anchors, concrete backfill, subsurface drains, etc. shall be required in these areas, as well as supporting engineering calculations.

4. STRUCTURAL STABILITY

- a. Special consideration shall be given to ensure vaults meet requirements for potential traffic loading and overburden support. Vaults shall be placed on stable, well consolidated native material or engineered fill with appropriate bedding. A structural analysis, geotechnical analysis, and engineering calculations may be required with the design, demonstrating stability and constructability. For vaults proposed under the traveled way, H-20 live loadings shall be accommodated.

5. ACCESS MAINTENANCE

- a. Access easements and roads shall be provided when vaults are not located within the public right-of-way.
- b. Access openings shall be provided at a distance of no less than 50 feet from any location within the vault, shall be a minimum of 36 inches in diameter, and shall have water-tight round lids. Additionally, access openings shall be located at both the inlet and outlet locations of the detention vault. Improvements shall be made to facilitate maintenance



equipment access to the maintenance access points year-round. Maintenance access point shall not be in areas that can be fenced off by private property owners.

- c. Access openings shall have surface access for maintenance vehicles.
- d. The distance from vault invert to finished grade shall be not more than 15 feet, unless otherwise approved by the City Engineer.
- e. OSHA confined space requirements shall be met for vaults, and entrances to confined spaces shall be clearly marked.

6. ACCESS ROADS

- a. Access roads shall meet the requirements set forth in Section 608.05.D above.

608.07 OUTLET FLOW CONTROL STRUCTURES

608.07.A In many instances, the 2-year pre-developed flow rate is so small that it is impracticable to release at the allowable flow rate from an outlet flow control structure. In these cases, the total post-developed 2-year storm event runoff shall be infiltrated (preferred) or stored for evaporation, and the detention facility designed to release at the pre-developed 10-year storm event flow rates. The minimum allowable diameter for an orifice in an outlet flow control structure shall be 1-1/2-inches due to the possibility of clogging or plugging.

608.07.B See Standard Drawings for typical outlet flow control structure.

608.07.C Primary (orifice(s)) and auxiliary (overflow riser pipe) outlets within the outlet flow control structure shall be designed in accordance with the most current edition of the *ODOT Hydraulics Manual, Chapter 12 – Storage Facilities* or the *City of Portland Stormwater Management Manual*.

608.08 RIGHT-OF-WAY / EASEMENTS

608.08.A All publicly maintained storm drainage systems including collection, conveyance, flow restrictors and detention systems not located in right-of-way shall be located in a drainage easement or tract dedicated to the City.

608.08.B Detention facilities in subdivisions or partitions shall be located in separate tracts dedicated to the City with access easements for maintenance where required. The minimum width of a dedicated tract or access easement shall be 15 feet. The City Engineer may require wider easements.

608.08.C When a storm drainage detention facility is located on property not owned by the developer, a permanent access and drainage easement shall be granted to the City from the owner in fee simple and contract purchaser of the property on which the facility is located. An all-weather access road to that facility, located within an access easement, shall be constructed in accordance with 608.05.D.



609 STORMWATER INFILTRATION

609.01 GENERAL

- 609.01.A** The City is known to have high seasonal groundwater issues and the groundwater elevations shown in adjacent well logs may or may not be a reflection of the seasonal variations that actually exist at the site. As such, the seasonal high groundwater elevation needs to be determined by field investigation and observed by the City Public Works Department so that the City can verify that proper vertical separation distances are being provided in order to support the infiltration facility design.
- 609.01.B** The City of Stayton's stormwater surface infiltration requirements are designed to:
- ❖ Protect watershed health by requiring onsite surface infiltration wherever feasible in order to mimic pre-development hydrologic conditions.
 - ❖ Protect the capacity of downstream infrastructure.
 - ❖ Protect groundwater resources by preventing and removing pollutants from stormwater before discharging it into an underground injection control (UIC).
- 609.01.C** All stormwater infiltration system design and testing requirements shall comply with the *City of Portland SWMM* unless otherwise approved by the City Engineer. All stormwater infiltration requirements are minimums and can be increased, as required by the City Engineer.
- 609.01.D** Field testing shall be performed by the Design Engineer or Geotechnical Engineer following construction of infiltration facilities in order to confirm that the design infiltration rates, and basin volumes meet or exceed the design.

609.02 SURFACE INFILTRATION

- 609.02.A** Stormwater shall be surface infiltrated onsite to the maximum extent feasible, before discharging any flows offsite. The appropriate use of surface infiltration depends on a number of factors, including soil type, soil conditions, slopes, and depth to groundwater. The point of discharge is also site specific and dependent on the availability and condition of public and private infrastructure. The feasibility of surface infiltration and the discharge point have a direct impact on the pollution reduction and flow control requirements for a site. Therefore, it is critical to determine the feasibility of surface infiltration and the point of discharge before designing a stormwater facility.
- 609.02.B** While many of the stormwater facilities aim to maximize surface infiltration, not every site can infiltrate all of the stormwater from large, intense rainfall events. Unless complete surface infiltration of the 100-year storm can be accomplished, an offsite discharge point must be identified.
- 609.02.C** The City has the authority to determine if infiltration is feasible or not, including approving or denying requests to infiltrate onsite or to discharge offsite from private and public properties or the public right-of-way

609.03 SUBSURFACE INFILTRATION

609.03.A UNDERGROUND INJECTION CONTROL (UIC)

1. In Oregon, all fresh water aquifers are protected as underground sources of drinking water. The Oregon Department of Environmental Quality (DEQ) regulates and requires the registration of



certain infiltration facilities as injection wells. Registration covers all injection wells, including stormwater drainage wells, industrial/commercial injection facilities, aquifer recharge wells, subsidence control wells, aquifer remediation wells, and other miscellaneous injection wells.

2. The use of a UIC for the discharge of stormwater shall not be considered unless specifically approved in advance by the City Engineer. If approved, the UIC shall be designed in accordance with DEQ and the most current edition of the *City of Portland SWMM* and will be required to be registered with DEQ. A geotechnical evaluation of the site, prepared by a geotechnical Engineer or licensed Geologist will be required. In addition to the minimum Federal UIC requirements, all UICs shall further comply with Oregon Administrative Rule 340-44.
3. An infiltration test and groundwater depth determination for UICs and retention basin design shall be performed prior to plan approval and done during the periods of high groundwater (January to May). Using well logs to determine the depth to ground water is not acceptable.



610 PRIVATE STORM DRAIN SYSTEMS

- 610.01.A** The City reviews, approves, and observes construction of all stormwater conveyance and management facilities on private property as part of the development permitting process. This includes, but is not limited to, private storm drain systems associated with parking areas, private streets, and other impervious surfaces that are required to conform to these Standards. Private storm drain systems associated with buildings on private property shall comply with the State of Oregon Plumbing Specialty Code and other applicable Building Codes.
- 610.01.B** Private storm drain systems will not be permitted within a public right-of-way, unless otherwise approved by the City Engineer. Where approved, private storm drain lines shall be a minimum of 6 inches in diameter and directly connected into a drainage structure of the public system at a location and elevation approved by the City Engineer. Private storm drain systems that convey water directly from private property shall be 3 inches in diameter for drains under sidewalks and through curbs.
- 610.01.C** Private easements for private storm drain systems are the responsibility of the property owners. Copies of the recorded easements must be given to the City prior to any construction.

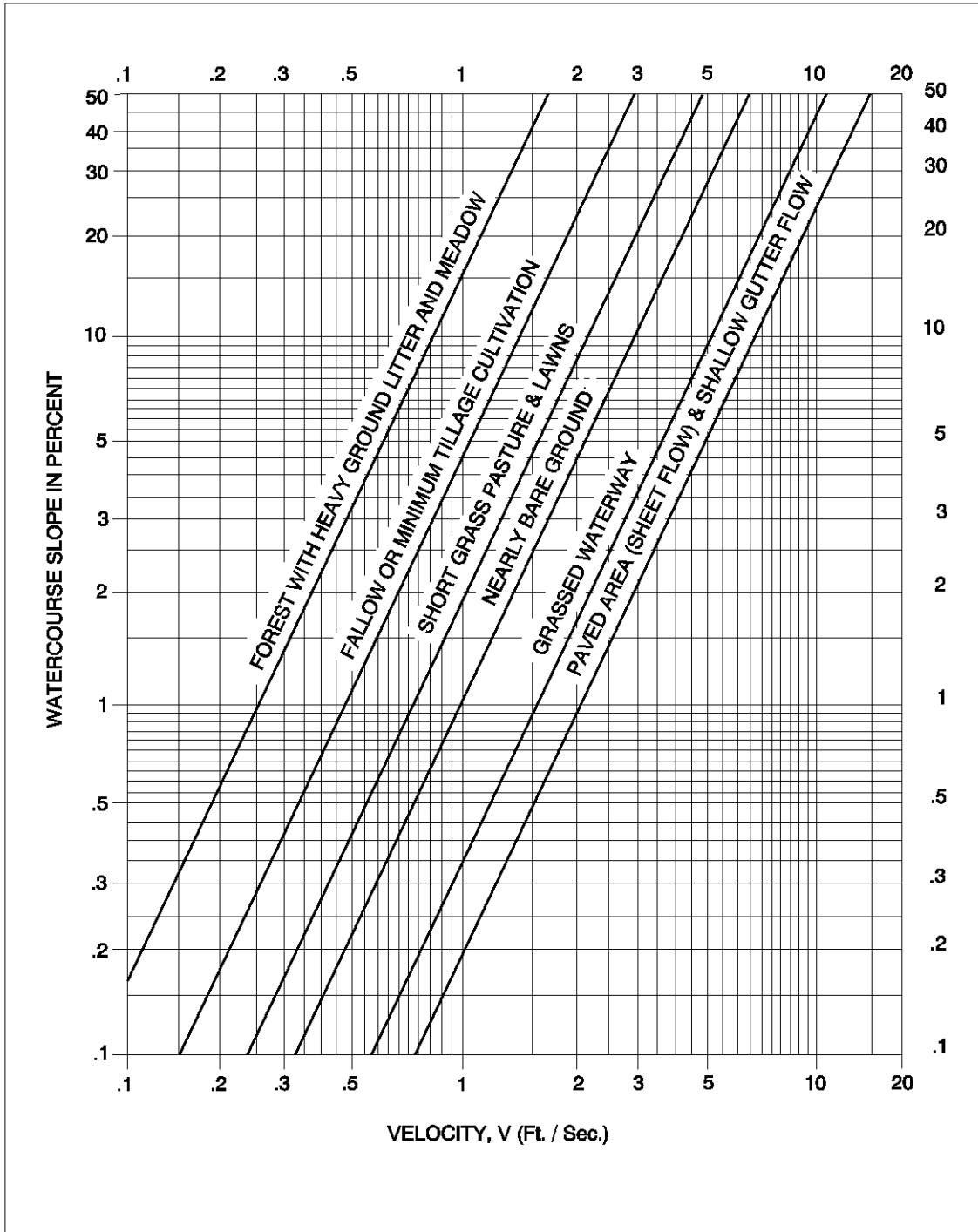


611 DESIGN ATTACHMENTS



SHALLOW CONCENTRATED FLOW VELOCITIES

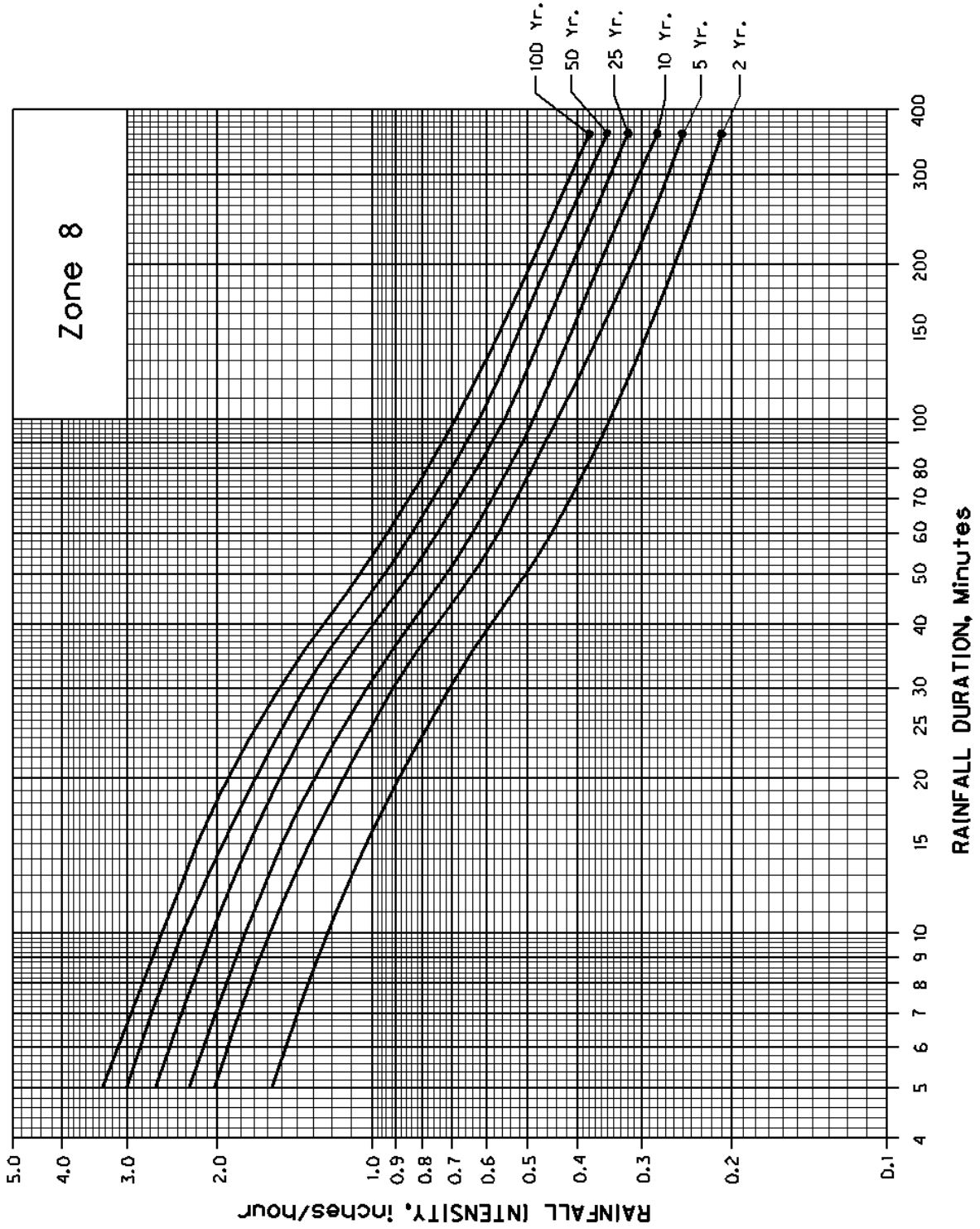
(source: ODOT Hydraulics Manual, 2011)





ODOT ZONE 8 IDF CURVE
(source: ODOT Hydraulics Manual, 2011)

RAINFALL INTENSITY - DURATION - RECURRENCE INTERVAL CURVES





NRCS RUNOFF CURVE NUMBERS

(source: City of Portland SWMM, 2008)

Runoff curve numbers for urban areas*

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

Runoff curve numbers for other agricultural lands*

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range-continuous forage for grazing					
<50% ground cover or heavily grazed with no mulch	Poor	68	79	86	89
50 to 75% ground cover and not heavily grazed	Fair	49	69	79	84
>75% ground cover and lightly or only occasionally grazed	Good	39	61	74	80
Meadow-continuous grass, protected from grazing and generally mowed for hay	-	30	58	71	78
Brush--weed-grass mixture with brush as the major element					
<50% ground cover	Poor	48	67	77	83
50 to 75% ground cover	Fair	35	56	70	77
>75% ground cover	Good	30	48	65	73
Woods-grass combination (orchard or tree farm)					
	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79



Runoff curve numbers for other agricultural lands*

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Woods					
Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.	Poor	45	66	77	83
Woods are grazed but not burned, and some forest litter covers the soil.	Fair	36	60	73	79
Woods are protected from grazing, and litter and brush adequately cover the soil.	Good	30	55	70	77

Runoff curve numbers for Simplified Approaches**

Cover description		Curve numbers for hydrologic soil group			
Simplified Approaches	Hydrologic condition	A	B	C	D
Eco-roof	Good	n/a	61	n/a	n/a
Roof Garden	Good	n/a	48	n/a	n/a
Contained Planter Box	Good	n/a	48	n/a	n/a
Infiltration & Flow-Through Planter Box	Good	n/a	48	n/a	n/a
Pervious Pavement	-	76	85	89	n/a
Trees					
New and/or Existing Evergreen	-	36	60	73	79
New and/or Existing Deciduous	-	36	60	73	79

n/a - Does not apply, as design criteria for the relevant mitigation measures do not include the use of this soil type.

*Soil Conservation Service, *Urban Hydrology for Small Watersheds*, Technical Release 55, pp. 2.5-2.8, June 1986.

**CNs of various cover types were assigned to the Proposed Simplified Approaches with similar cover types as follows:

Eco-roof – assumed grass in good condition with soil type B.

Roof Garden – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Contained Planter Box – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Infiltration & Flow-Through Planter Box – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Pervious Pavement – assumed gravel.

Trees – assumed woods with fair hydrologic conditions.

Note: To determine hydrologic soil type, consult local USDA Soil Conservation Service Soil Survey.



NRCS 24-HOUR TYPE 1A HYETOGRAPHIC DISTRIBUTION

(source: City of Portland SWMM, 2008)

Time From Start of Storm, Minutes	% Rainfall	Cumu- lative %	Rainfall	Time From Start of Storm, Minutes	% Rainfall	Cumu- lative %	Rainfall	Time From Start of Storm, Minutes	% Rainfall	Cumu- lative %	Rainfall	Time From Start of Storm, Minutes	% Rainfall	Cumu- lative %	Rainfall
0 - 10	0.40	0.40	0.40	360 - 370	0.95	22.57	0.95	720 - 730	0.72	67.40	67.40	1080 - 1090	0.40	86.00	86.00
10 - 20	0.40	0.80	0.80	370 - 380	0.95	23.52	1.90	730 - 740	0.72	68.12	68.12	1090 - 1100	0.40	86.40	86.40
20 - 30	0.40	1.20	1.20	380 - 390	0.95	24.47	2.85	740 - 750	0.72	68.84	68.84	1100 - 1110	0.40	86.80	86.80
30 - 40	0.40	1.60	1.60	390 - 400	0.95	25.42	3.80	750 - 760	0.72	69.56	69.56	1110 - 1120	0.40	87.20	87.20
40 - 50	0.40	2.00	2.00	400 - 410	1.34	26.76	5.14	760 - 770	0.57	70.13	70.13	1120 - 1130	0.40	87.60	87.60
50 - 60	0.40	2.40	2.40	410 - 420	1.34	28.10	6.48	770 - 780	0.57	70.70	70.70	1130 - 1140	0.40	88.00	88.00
60 - 70	0.40	2.80	2.80	420 - 430	1.34	29.44	7.82	780 - 790	0.57	71.27	71.27	1140 - 1150	0.40	88.40	88.40
70 - 80	0.40	3.20	3.20	430 - 440	1.80	31.24	9.62	790 - 800	0.57	71.84	71.84	1150 - 1160	0.40	88.80	88.80
80 - 90	0.40	3.60	3.60	440 - 450	1.80	33.04	11.42	800 - 810	0.57	72.41	72.41	1160 - 1170	0.40	89.20	89.20
90 - 100	0.40	4.00	4.00	450 - 460	3.40	36.44	14.82	810 - 820	0.57	72.98	72.98	1170 - 1180	0.40	89.60	89.60
100 - 110	0.50	4.50	4.50	460 - 470	5.40	41.84	20.22	820 - 830	0.57	73.55	73.55	1180 - 1190	0.40	90.00	90.00
110 - 120	0.50	5.00	5.00	470 - 480	2.70	44.54	22.92	830 - 840	0.57	74.12	74.12	1190 - 1200	0.40	90.40	90.40
120 - 130	0.50	5.50	5.50	480 - 490	1.80	46.34	24.72	840 - 850	0.57	74.69	74.69	1200 - 1210	0.40	90.80	90.80
130 - 140	0.50	6.00	6.00	490 - 500	1.34	47.68	26.06	850 - 860	0.57	75.26	75.26	1210 - 1220	0.40	91.20	91.20
140 - 150	0.50	6.50	6.50	500 - 510	1.34	49.02	27.40	860 - 870	0.57	75.83	75.83	1220 - 1230	0.40	91.60	91.60
150 - 160	0.50	7.00	7.00	510 - 520	1.34	50.36	28.74	870 - 880	0.57	76.40	76.40	1230 - 1240	0.40	92.00	92.00
160 - 170	0.60	7.60	7.60	520 - 530	0.88	51.24	29.62	880 - 890	0.50	76.90	76.90	1240 - 1250	0.40	92.40	92.40
170 - 180	0.60	8.20	8.20	530 - 540	0.88	52.12	30.50	890 - 900	0.50	77.40	77.40	1250 - 1260	0.40	92.80	92.80
180 - 190	0.60	8.80	8.80	540 - 550	0.88	53.00	31.38	900 - 910	0.50	77.90	77.90	1260 - 1270	0.40	93.20	93.20
190 - 200	0.60	9.40	9.40	550 - 560	0.88	53.88	32.26	910 - 920	0.50	78.40	78.40	1270 - 1280	0.40	93.60	93.60
200 - 210	0.60	10.00	10.00	560 - 570	0.88	54.76	33.14	920 - 930	0.50	78.90	78.90	1280 - 1290	0.40	94.00	94.00
210 - 220	0.60	10.60	10.60	570 - 580	0.88	55.64	34.02	930 - 940	0.50	79.40	79.40	1290 - 1300	0.40	94.40	94.40
220 - 230	0.70	11.30	11.30	580 - 590	0.88	56.52	34.90	940 - 950	0.50	79.90	79.90	1300 - 1310	0.40	94.80	94.80
230 - 240	0.70	12.00	12.00	590 - 600	0.88	57.40	35.78	950 - 960	0.50	80.40	80.40	1310 - 1320	0.40	95.20	95.20
240 - 250	0.70	12.70	12.70	600 - 610	0.88	58.28	36.66	960 - 970	0.50	80.90	80.90	1320 - 1330	0.40	95.60	95.60
250 - 260	0.70	13.40	13.40	610 - 620	0.88	59.16	37.54	970 - 980	0.50	81.40	81.40	1330 - 1340	0.40	96.00	96.00
260 - 270	0.70	14.10	14.10	620 - 630	0.88	60.04	38.42	980 - 990	0.50	81.90	81.90	1340 - 1350	0.40	96.40	96.40
270 - 280	0.70	14.80	14.80	630 - 640	0.88	60.92	39.30	990 - 1000	0.50	82.40	82.40	1350 - 1360	0.40	96.80	96.80
280 - 290	0.82	15.62	15.62	640 - 650	0.72	61.64	40.02	1000 - 1010	0.40	82.80	82.80	1360 - 1370	0.40	97.20	97.20
290 - 300	0.82	16.44	16.44	650 - 660	0.72	62.36	40.74	1010 - 1020	0.40	83.20	83.20	1370 - 1380	0.40	97.60	97.60
300 - 310	0.82	17.26	17.26	660 - 670	0.72	63.08	41.46	1020 - 1030	0.40	83.60	83.60	1380 - 1390	0.40	98.00	98.00
310 - 320	0.82	18.08	18.08	670 - 680	0.72	63.80	42.18	1030 - 1040	0.40	84.00	84.00	1390 - 1400	0.40	98.40	98.40
320 - 330	0.82	18.90	18.90	680 - 690	0.72	64.52	42.90	1040 - 1050	0.40	84.40	84.40	1400 - 1410	0.40	98.80	98.80
330 - 340	0.82	19.72	19.72	690 - 700	0.72	65.24	43.62	1050 - 1060	0.40	84.80	84.80	1410 - 1420	0.40	99.20	99.20
340 - 350	0.95	20.67	20.67	700 - 710	0.72	65.96	44.34	1060 - 1070	0.40	85.20	85.20	1420 - 1430	0.40	99.60	99.60
350 - 360	0.95	21.62	21.62	710 - 720	0.72	66.68	45.06	1070 - 1080	0.40	85.60	85.60	1430 - 1440	0.40	100.00	100.00



SAMPLE DRAINAGE REPORT FORMAT

1. Cover Sheet

- ❖ Project name and owner
- ❖ Site address
- ❖ Associated land use/permit numbers
- ❖ Report submittal date
- ❖ Preliminary submittal or final version
- ❖ Engineering firm/address
- ❖ Design Engineer name/contact information

2. Title Sheet with Design Engineer's Certification Statement and PE Stamp

"I hereby certify that this Drainage Report for _____ (name of project) has been prepared by me or under my direct supervision and complies with the City of Stayton's Public Works Standards and standard engineering practice."

*Design
Engineer's
Professional
Oregon Stamp*

3. Table of Contents with List of Tables, List of Figures, Appendices, etc.

4. Project Overview and Description

- ❖ Purpose of study (proposed improvements)
- ❖ Project location and site description (include vicinity map)
- ❖ Project planning/permit requirements (property zoning, permits required (local, state, federal))
- ❖ Stormwater concepts and relation to master plan.

5. Existing Site Characteristics

- ❖ Existing and offsite contributing area topography and drainage patterns
- ❖ Existing and offsite contributing area land use and ground cover
- ❖ Existing soils information (include soil report, where applicable)
 - Engineering properties (soil map and classifications)
 - Infiltration testing results

6. Drainage Sub-basin Descriptions and Maps

- ❖ Existing conditions (total size, percent impervious/pervious, point(s) of discharge, etc.)
- ❖ Proposed developed conditions (total size, percent impervious/pervious, point(s) of discharge, etc.)

7. Hydrologic Design Methodology and Analysis

- ❖ Methodology/Assumptions
 - Design storms used
 - Computation methods
 - Software used
 - Safety factors, curve numbers, and design coefficients
 - Clarify any variations from the Public Works Standards or normal standard engineering practices
- ❖ Comparison table of the peak runoff flow rates for pre- and post-development **without** flow control. See Example Table 1 below.



Example Table 1

Pre- vs. Post-Development Peak Runoff Flow Rates **without** Flow Control

Design Point	2-yr Storm Event		5-yr Storm Event		10-yr Storm Event		25-yr Storm Event		50-yr Storm Event		100-yr Storm Event	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1												
2												

8. Stormwater Management Facility Design

- ❖ Design Methodology/Assumptions
 - Computation methods
 - Software used
 - Safety factors, design coefficients, etc.
 - Clarify any variations from the Public Works Standards or normal standard engineering practices
- ❖ Catchment and facility table. See Example Table 2 below.
- ❖ Comparison table of the peak runoff flow rates for pre- and post-development **with** flow control. Table must show that the project meets the flow control requirements. See Example Table 3 below.
- ❖ Determination of the overflow route for the 24-hour, 100-year storm event.
- ❖ Stormwater quality considerations/calculations.
- ❖ Brief summary of any special operation and maintenance requirements for the stormwater management facility (as applicable). An operation and maintenance (O&M) plan and agreement is required for privately owned and maintained stormwater quality and quantity control facilities. The O&M plan will need to be an attachment to any declaration of covenants for the project and included as part of the recorded Stormwater O&M Agreement.

Example Table 2

Catchment and Facility Table (show each catchment as well as proposed facility)

Catchment/ Facility ID	Source (roof, road, etc)	Total Site Area (sf/ac)	Impervious Area (sf/ac)	Ownership (public/private)	Facility Type	Facility Size (sf/ac)
AA						
BB						

Example Table 3

Pre- vs. Post-Development Peak Runoff Flow Rates **with** Flow Control

Design Point	2-yr Storm Event		5-yr Storm Event		10-yr Storm Event		25-yr Storm Event		50-yr Storm Event		100-yr Storm Event	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1												
2												

9. Conveyance System Design Information

- ❖ Design Methodology/Assumptions



- Computation methods
- Software used
- Safety factors, design coefficients, etc.
- ❖ Existing site conveyance piping (as applicable)
- ❖ New site conveyance piping

10. Downstream Capacity Analysis Summary/Report

- ❖ If a downstream capacity analysis is required, the summary/report shall identify capacity issues that may result from the project/development runoff, and provide the supporting data and analysis as required. The summary/report shall provide recommendations for mitigation downstream capacity issues identified.
- ❖ Open Channel Hydraulic Modeling: Where open channel hydraulic modeling is used in the downstream analysis, the following information shall be included in the report:
 - A site map showing the location of the project and the surrounding drainage basin.
 - A description of all calculations, references, and modeling used in the analysis.
 - A discussion of how Manning's n-values were determined, including photos of typical cross sections used in determining the n-values.
 - A description of the storm events used in the study and where the information was obtained.
 - A brief description of the physical condition and the estimated capacity of all existing drainage structures analyzed.
 - A list of any previous hydraulic analysis and references relied on for the current study.
 - Cross section plots for all cross sections, plotted at no more than two per 8½ x 11 sheet. Each cross section shall be scaled consistently and properly labeled with the cross section number. Cross sections shall be perpendicular to the flow and waterway centerline. Sections shall be oriented left to right facing downstream and show the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year water surface elevations.
 - An electronic digital file with the model input and output files shall be included in the report package.
 - Additional information may be required by the City as appropriate, based on the size and complexity of the project.

11. Floodway and Floodplain Analysis

If a Floodway/Floodplain Analysis is required, the following information shall be submitted in addition to the requirements listed above for Open Channel Hydraulic Modeling as part of the Downstream Capacity Analysis Summary/Report:

- ❖ A description of how the upstream and downstream boundary conditions were established.
- ❖ All proposed grading, culverts, bridges, drop structures, access ramps, etc., that are in the floodplain must be shown and included in the modeling.
- ❖ Describe the floodway analysis.
- ❖ Photographs of the existing study reach shall be included.
- ❖ A table with existing and proposed water surface elevations and velocities at each cross section.
- ❖ The 100-year floodplain and floodway lines shall be clearly shown on the map based on the modeling results and tied to the appropriate contour lines.

12. Conclusions/Recommendations

- ❖ Compliance with the Public Works Standards
- ❖ How water quality, flow control, and discharge requirements are satisfied
- ❖ Anticipated post-developed peak flows at point(s) of discharge
- ❖ How the stormwater system will function during the 100-year storm event, inundation level, and any provisions needed to convey the 100-year storm event to an approved point of discharge.
- ❖ Recommendations for mitigation of any downstream capacity issues identified (as applicable).
- ❖ Recommendations based on floodway and floodplain analysis (as applicable).



13. Appendices (Supporting data)

- ❖ Maps/Exhibits
 - Project Vicinity Map
 - Existing Conditions Map
 - North arrow, elevations and topography, property lines, lot area and setbacks, footprints of structures, easements and driveways, wells and septic systems, utility lines, sub-basin area delineation, impervious and pervious areas, existing surface drainage, assumed time of concentration flow path, point(s) of discharge.
 - Developed Conditions Map
 - North arrow, elevations and topography, property lines, lot area and setbacks, footprints of structures, easements and driveways, wells and septic systems, utility lines, width of right-of-way and curb height, sub-basin area delineation, impervious and pervious areas, existing surface drainage, assumed time of concentration flow path, type and location of stormwater management facility, existing and proposed surface drainage, proposed discharge point.
 - Stormwater Management Facility Information (with cross sections and details showing elevations of inlets, outlets, and discharge points to show how gravity drainage will be met)
 - Landscaping
- ❖ Web Soil Survey Information (as applicable)
- ❖ Geotechnical/Soils Report (as applicable)
- ❖ Calculations
 - Hydrologic Design Calculations (sub-basin hydrographs, time of concentration, runoff volumes, etc.)
 - Hydraulic Design Calculations (for all culverts, storm drainage pipes, outlet control structures, overflow/spillways, etc.)
- ❖ Downstream Capacity Analysis Summary/Report (as applicable)
- ❖ Floodway and Floodplain Analysis Summary/Report (as applicable)
- ❖ Stormwater Facility Operations and Maintenance (O&M) Plan and Agreement
 - Must include entity responsible for long-term fiscal responsibilities of O&M.
- ❖ Other supporting information as appropriate.

DIVISION 7 – EROSION AND SEDIMENT CONTROL

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DIVISION 7

EROSION AND SEDIMENT CONTROL

701 GENERAL

701.01 AUTHORITY AND PURPOSE

- 701.01.A** These Design Standards shall apply to all improvements within existing and proposed public right-of-way and public easements, to all improvements to be maintained by the City, and to all improvements for which the City Code requires approval by the City.
- 701.01.B** Private construction firms, Developers, consulting engineers, or any other individuals or business entities engaged in the design and construction of improvement projects shall comply with these standards. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used whenever practical.
- 701.01.C** It is important to emphasize that these Design Standards are not intended to inappropriately restrict or constrain the originality or innovativeness of the Design Engineer and his or her ability to exercise and apply professional judgment to each situation and project. The City recognizes that every improvement project has unique characteristics and situations. These Design Standards cannot provide for all situations and are intended to assist, but not to serve as a substitute for competent work by design professionals. It is expected that the Design Engineer will bring to each project the standard of care from the Design Engineer's respective discipline.
- 701.01.D** If the Design Engineer anticipates challenges in meeting these Design Standards, they should contact the City Engineer prior to extensive design efforts. The City Engineer will seek to work with each designer to achieve a satisfactory design and construction project that is in the best long-term interests of the City of Stayton and one that complies with applicable rules and regulations.
- 701.01.E** These Design Standards are not intended to limit any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Design Standards will be judged; however, on the likelihood that such variance will produce a comparable result, or long-term benefit to the City, while meeting the intended purpose of the design standard.
- 701.01.F** Requests for alternatives to these Design Standards will be considered for approval by the City Engineer as the need arises and conditions warrant modification. The Design Modification Request (DMR) must show that the variance meets the intent of the Design Standards and will not compromise safety, impact other properties or cause an increase in maintenance. This consideration will be on a case-by-case basis and require sufficient justification prior to approval. All DMRs shall be submitted per 101.09.C of the Design Standards.
- 701.01.G** In the case of conflicts between the text of these Design Standards and the Standard Drawings, or between the provisions of these Design Standards and the Standard Construction Specifications, the more stringent as determined by the City Engineer shall apply.



- 701.01.H** All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to NAVD 88 vertical datum. Vertical benchmark locations shall be coordinated with the City.
- 701.01.I** On completion of projects to become public works facilities, the Design Engineer shall submit one complete set of reproducible “Record Drawings” (As-Builts), a digital file containing electronic PDFs and cad files (AutoCAD, or others as approved) to the City Engineer. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate public works facilities. No bond will be released until the City Engineer receives and approves an acceptable set of reproducible Record Drawings from the Design Engineer, with his/her stamp of certification. See Division 2, Section 202 for specific As-Built requirements.
- 701.01.J** For privately financed public improvements, the Design Engineer, at the completion of construction, shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- 701.01.K** Before the City accepts a public works project for operation and maintenance and releases the Performance Bond, a one (1) year Warranty Bond on all materials and workmanship incorporated in the project shall be provided to the City.
- 701.01.L** The objective of these Design Standards is to provide for an erosion and sediment control plan that will:
- ❖ Safely manage stormwater runoff that is generated upstream and on the site from given storm intervals to an approved discharge point.
 - ❖ Maintain or improve Stayton’s overall stormwater quality and incorporate best management practices.
 - ❖ Be consistent with the Stayton Municipal Code (SMC), Stayton Standard Construction Specifications and applicable state and federal regulations and requirements for stormwater quantity and quality.

701.02 APPLICABILITY

- 701.02.A** This Division will be referred to as the Erosion and Sediment Control Design Standards. Erosion and Sediment Control measures shall be provided on all property improvements within the City per these Design Standards for all types of development, including:
1. Partitions and subdivisions.
 2. Commercial, industrial, multifamily, and single-family residential developments.
 3. Construction or reconstruction of public roadways and temporary detours.
 4. Developments entailing construction in or adjacent to any existing stream or surface watercourse including intermittent streams.
 5. Developments requiring construction in or adjacent to the 100-year floodplain.

701.03 REFERENCES

- 701.03.A** These Design Standards are intended to be consistent with the most current provisions of the documents and requirements listed and referenced in Section 101.03 and others specifically listed below. Projects are expected to be consistent with the following:



1. Applicable concepts consistent with the most recent Stormwater Master Plan adopted by the City of Stayton. Where additional detailed information and background is required for a particular project, the Stormwater Master Plan shall be referred and adhered to, as applicable. Any deviations from the Stormwater Master Plan shall be flagged and presented to the City Engineer for consideration.
2. Applicable design guidelines published by the American Society of Civil Engineers.
3. Applicable design guidelines published by the Federal Highway Administration.
4. Applicable design guidelines published by the Oregon Department of Transportation.
5. Applicable stormwater and erosion control design manuals including, but not limited to, the following.
 - ❖ ODOT Erosion Control Manual, Guidelines for Developing and Implementing Erosion and Sediment Controls
 - ❖ Oregon DEQ Surface Water Management, Small Lot Construction Stormwater Permit Manual, NPDES 1200-C general Permit Disturbance Less than One Acre
 - ❖ Oregon DEQ Surface Water Management, Construction Stormwater Permit Guidance, 1200-C NPDES General Permit, Disturbance of One Acre or More
 - ❖ Oregon DEQ Water Quality Division, Construction Stormwater Best Management Practices Manual
 - ❖ Clean Water Services – Erosion Prevention and Sediment Control Planning and Design Manual
 - ❖ U.S. EPA National Menu of Best Management Practices (BMPs) for Stormwater



702 EROSION AND SEDIMENT CONTROL MEASURES FOR PROJECTS LESS THAN ONE ACRE

702.01 GENERAL

702.01.A APPLICATION AND PURPOSE

1. It is a City requirement to reduce the amount of sediment and other pollutants reaching the public storm and surface water system resulting from development, construction, grading, excavating, clearing, and any other activity that accelerates erosion, through the use of Best Management Practices (BMPs).
2. It is the policy of the City to require temporary and permanent measures for all construction projects to lessen the adverse effects of construction on the environment. Projects shall include properly installed, operated, and maintained temporary and permanent erosion-control measures as provided in these Standards or in an approved plan, designed to protect the environment during the term of the project. Compliance with the measures prescribed herein or in an approved plan does not lessen the necessity to provide effective and comprehensive erosion prevention and sediment control.
3. The use of erosion prevention techniques shall be emphasized, rather than measures to control sediment. This shall be especially important on construction sites immediately before and during the rainy season. Erosion prevention techniques are designed to protect soil particles from the force of rain and wind so they will not erode. When land is disturbed at a construction site, the erosion rate accelerates dramatically.
4. This section describes the requirements for preparing an Erosion and Sediment Control Plan (ESCP) for projects less than one acre requiring a site development permit and/or a building permit.

702.01.B PERMIT REQUIREMENTS

1. Erosion and sediment control measures are required by the City for all developments regardless of the project size and shall be shown in the submitted plan review sets.
2. An erosion and sediment control plan shall be required to be submitted to the City for any ground-disturbing activity that requires a building, public works, or development permit. The plan shall be submitted with the site development and/or building permit application.
3. Construction projects which disturb one or more acres of land through clearing, grading excavating, or stockpiling of fill material, or less than one acre that is part of a larger common plan of development or sale that ultimately disturbs one acre or more is required to obtain a Department of Environmental Quality (DEQ) National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit 1200-C or CN as described further in Section 703.

702.01.C EROSION PROHIBITED

1. Construction activities that have potential to cause erosion or sediment movement shall not begin until the ESCP and implementation schedules are approved. All BMP measures are to be in place prior to any disturbance of the site.



2. Visible or measurable erosion that enters, or is likely to enter, the public or private stormwater and surface water system or other properties is hereby prohibited and is a violation of these Standards. An offsite sedimentation control facility may be utilized if it has been identified and approved in writing by the City Engineer, written approval is obtained from the respective property owner, and a written agreement for rehabilitation of the facility by the applicant or contractor is submitted to the City. The owner of the property or the applicant under a Public Works Permit, together with any person or persons, including but not limited to the Contractor or the Design Engineer causing such erosion, shall be held responsible for violation of the City's Standards.
3. No person shall create physical erosion by dragging, dropping, tracking, or otherwise placing or depositing, or permitting to be deposited, mud, dirt, rock, or other such debris on a public street, or into any part of the public stormwater and surface water system, or into any part of a private stormwater and surface water system that drains or connects to the public stormwater and surface water system. Any such deposited material shall be immediately removed by hand labor or mechanical means. No material shall be washed or flushed into any part of the stormwater and surface water system until all means to remove the debris are exhausted and preventive sediment filtration is in place.
4. The owner of the property or the applicant under a Public Works Permit is responsible to ensure that adequate erosion and sediment control measures are planned, designed, constructed, operated, and maintained to prevent sediment and pollutants from leaving the construction site. These requirements shall be upheld throughout the life of the construction project. Additional or revised erosion control measures may be necessary based upon field observations of the effectiveness of the original planned measures. The applicant shall revise and add measures as necessary to comply with regulatory permit requirements. Approval of an ESCP by the City does not relieve the applicant's responsibility to comply with regulatory permit requirements.
5. The following minimum provisions are required for projects less than one acre requiring a site development permit and/or a building permit.
 - a. Install BMP measures intended to keep soil on site or out of water bodies, storm drainage systems or the public right-of-way as the first step in any development. These measures shall be made functional prior to any development taking place.
 - b. Remove any soil that enters the public right-of-way.
 - c. Protect stormwater inlets that are functioning during the course of the development by approved BMP measures so that sediment-laden water cannot enter the inlets without first being filtered.
 - d. Select appropriate BMPs from the Standard Drawings, the ODOT Erosion Control Manual, and/or the Clean Water Services Erosion Prevention and Sediment Control Planning and Design Manual. The minimum BMPs for single family, duplex, and triplex projects are as follows:
 - ❖ Linear and perimeter control such as straw wattles or sediment fencing.
 - ❖ Storm drain inlet protection such as bio-filter bags or inset bags.
 - ❖ Construction entrance/exit tracking controls such as a gravel entrance or a rumble track.
 - ❖ Soil stockpile management such as erosion control blankets or plastic sheeting.
 - ❖ Concrete truck washout and cleanup.



6. Existing vegetation shall be protected and left in place whenever practicable. Work areas shall be carefully located and marked to reduce potential damage to trees and existing vegetation. Trees shall not be used as anchors for stabilizing working equipment. Where required, trees and existing vegetation shall be protected with a non-movable, chain link fence.
7. Where existing vegetation has been removed, or the original land contours have been disturbed, the site shall be revegetated, and the vegetation established, as soon as practicable. Apply permanent or temporary soil stabilization to denuded development site areas in conformance with the following schedule:
 - ❖ Between October 1 and May 31, all denuded sites shall be provided with either temporary or permanent soil stabilization as soon as practicable, but in no case more than 2 days after ground-disturbing activity occurs.
 - ❖ Between May 1 and September 30, temporary erosion and sediment control measures to reduce dust and sediment transport shall be applied as soon as practicable, but in no case more than seven days after ground-disturbing activity occurs.

702.01.D ENFORCEMENT

1. Failure to comply with any provision of this Section or with any term of a permit shall be deemed a violation and subject to enforcement action pursuant to applicable City ordinance and resolutions and orders, including all implementing rules and regulations. Nothing in this Section shall relieve any person of the obligation to comply with the regulations or permits of the City, County, State, or Federal authority.

702.02 EROSION AND SEDIMENT CONTROL PLAN (ESCP)

702.02.A GENERAL

1. An Erosion and Sediment Control Plan (ESCP) is a detailed description of where and how BMPs will be implemented to control erosion, sediment, and pollutants on a development site. The ESCP is a central, specific component of the overall site development management plan. The ultimate goal of erosion prevention is to limit the time and area of ground disturbance, keep pollutants separate from stormwater runoff, and establish permanent groundcover as quickly and thoroughly as possible.
2. The ESCP shall be submitted and approved prior to any ground disturbance. Construction projects with ground disturbance of one (1) or more acres will require a NPDES 1200-C or CN permit, as required by the Oregon Department of Environmental Quality. At a minimum the following must be included on the ESCP:
 - a. Provide the name and phone number of the person(s) responsible for the erosion and sediment control measures on site.
 - b. Identify any slopes greater than 5%.
 - c. Show the location of and the maintenance schedule of erosion and sediment control measures to be used on the site including but not limited to:
 - ❖ Gravel construction entrance/exit.
 - ❖ Sediment barrier on the downslope side(s) of the site.



- ❖ Storm drain inlet protection.
- ❖ Concrete truck washout.

3. Between October 1 and May 31 additional wet weather BMPs shall be utilized. See Section 702.02.C.

702.02.B ESCP REVIEW AND APPROVAL WHEN REQUIRED BY CITY PERMIT

- ❖ The City Engineer may deny a plan if it is determined that the plan does not meet the minimum ESCP requirements stated above and/or standard industry practices.
- ❖ Review of ESCPs will look for the following approval criteria:
 - Efforts to minimize area of disturbance.
 - Use of combination of BMP types, not just sediment controls. Good plans will include at least one type of BMP from each BMP group in the manual (site entry, perimeter, stormwater, erosion prevention, etc.).
 - Use of stabilized construction entrances away from the low points of sites. Use of multiple entrances for large sites.
 - A specific construction schedule.
 - Description of stormwater controls prior to storm sewer or infiltration system installation.
 - Description of vehicle storage, maintenance, and fueling practices. Designation of staging areas, if appropriate.
 - Description of designated and protected materials storage and stockpile areas.
 - Description of site inspection and maintenance requirements for all BMPs after any storm event.
- ❖ Approval of an Erosion and Sediment Control Plan by the City does not relieve the applicant's responsibility to ensure that the approved erosion control BMPs are constructed and maintained to contain sediment and pollutants on the construction site.
- ❖ During the construction period, measures in the ESCP shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment-laden water does not leave the site.

702.02.C WET WEATHER MEASURES

1. On sites where vegetation and ground cover have been removed, vegetative ground cover shall be stabilized according to the following time frames.
 - ❖ All seeding applications must be completed prior to September 1st with ground cover established by October 15th.
 - ❖ Wet weather season – October 1st through May 31st . Open areas shall be protected through the winter with mulch, erosion blankets, or other method(s) approved by the City's authorized representative.
 - ❖ Soils exposed during wet weather season as a result of construction must be covered at the end of each day.



702.02.D MAINTENANCE AND INSPECTIONS

1. The developer or designated person shall be required to provide ongoing inspection of erosion and sediment control measures throughout the life of the project. Inspections shall be recorded on an approved monitoring form. Minimum inspection requirements shall be as follows.
 - a. Once every two weeks on inactive sites.
 - b. Within 24 hours followings a water quality event. A water quality event is 1.61 inches of rainfall in a 24-hour period.
2. If the facilities and techniques approved in an erosion and sediment control plan are not effective or sufficient as determined by the City site inspection, the applicant shall submit a revised plan within three (3) working days of written notification by the City Engineer. On approval of the revised plan by the City Engineer, the applicant shall immediately implement the additional facilities and techniques included in the revised plan.
3. In cases where erosion is likely to occur, the City Engineer may require the applicant to install interim control measures before submitting a revised erosion and sediment control plan.
4. The erosion and sediment control measures shall remain in place and be maintained in good condition until all disturbed soil areas are permanently stabilized by installation and establishment of landscaping, grass, or mulching, or are otherwise covered and protected from erosion.

702.02.E CITY INSPECTION OF EROSION CONTROL MEASURES

1. City Initial Inspection: On a site development or any other type of project, the erosion and sediment control measures shall be installed before the start of any permitted activity. The applicant shall coordinate with the City Engineer for a pre-construction conference before beginning any site clearing or grading.
2. City Final Inspection: A final erosion control inspection will be required before the removal of erosion and sediment control measurements. Site conditions must be permanently stabilized.



703 EROSION AND SEDIMENT CONTROL MEASURES FOR PROJECTS GREATER THAN ONE-ACRE

703.01 GENERAL

703.01.A APPLICATION AND PURPOSE

1. This section describes the general requirements for preparing an Erosion and Sediment Control Plan (ESCP) for projects in excess of one acre that will require an Oregon DEQ 1200-C permit. The Developer is required to follow all of the Oregon DEQ 1200-C permit requirements.
2. It is a City requirement to reduce the amount of sediment and other pollutants reaching the public storm and surface water system resulting from development, construction, grading, excavating, clearing, and any other activity that accelerates erosion, through the use of Best Management Practices (BMPs).
3. It is the policy of the City to require temporary and permanent measures for all construction projects to lessen the adverse effects of construction on the environment. Projects shall include properly installed, operated, and maintained temporary and permanent erosion-control measures as provided in these Standards or in an approved plan, designed to protect the environment during the term of the project. Compliance with the measures prescribed herein or in an approved plan does not lessen the necessity to provide effective and comprehensive erosion prevention and sediment control.

The use of erosion prevention techniques shall be emphasized, rather than measures to control sediment. This shall be especially important on construction sites immediately before and during the rainy season. Erosion prevention techniques are designed to protect soil particles from the force of rain and wind so they will not erode. When land is disturbed at a construction site, the erosion rate accelerates dramatically.

703.01.B PERMIT REQUIREMENTS

1. Erosion and sediment control measures are required by the City for all developments regardless of the project size and shall be shown in the submitted plan review sets.
2. An erosion and sediment control plan shall be required to be submitted to the City for any ground-disturbing activity that requires a City building, public works, or development permit. The plan shall be submitted with the building permit application.
3. Construction projects which disturb one or more acres of land through clearing, grading excavating, or stockpiling of fill material, or less than one acre that is part of a larger common plan of development or sale that ultimately disturbs one acre or more is required to obtain a Department of Environmental Quality (DEQ) National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit 1200-C or CN.

703.01.C EROSION PROHIBITED

1. Construction activities that have potential to cause erosion or sediment movement shall not begin until the ESCP and implementation schedules are approved by the City Engineer and a 1200-C permit has been obtained.



2. Visible or measurable erosion that enters, or is likely to enter, the public or private stormwater and surface water system or other properties is hereby prohibited and is a violation of these Standards. An offsite sedimentation control facility may be utilized if it has been identified and approved in writing by the City Engineer, written approval is obtained from the respective property owner, and a written agreement for rehabilitation of the facility by the applicant or contractor is submitted to the City. The owner of the property or the applicant under a Public Works Permit, together with any person or persons, including but not limited to the Contractor or the Design Engineer causing such erosion, shall be held responsible for violation of the City's Standards.
3. No person shall create physical erosion by dragging, dropping, tracking, or otherwise placing or depositing, or permitting to be deposited, mud, dirt, rock, or other such debris on a public street, or into any part of the public stormwater and surface water system, or into any part of a private stormwater and surface water system that drains or connects to the public stormwater and surface water system. Any such deposited material shall be immediately removed by hand labor or mechanical means. No material shall be washed or flushed into any part of the stormwater and surface water system until all mechanical means to remove the debris are exhausted and preventive sediment filtration is in place.
4. The owner of the property or the applicant under a Site Development or Building Permit, is responsible to ensure that adequate erosion and sediment control measures are planned, designed, constructed, operated, and maintained to prevent sediment and pollutants from leaving the construction site. These requirements shall be upheld throughout the life of the construction project. Additional or revised erosion control measures may be necessary based upon field observations of the effectiveness of the original planned measures. The applicant shall revise and add measures as necessary to comply with regulatory permit requirements. Approval of an ESCP by the City does not relieve the applicant's responsibility to comply with regulatory permit requirements.
5. The following minimum provisions are required for all ground-disturbing activities:
 - a. Install BMP measures intended to keep soil on site or out of water bodies, storm drainage systems or the public right-of-way as the first step in any development. These measures shall be made functional prior to any development taking place.
 - b. Remove any soil that enters the public right-of-way.
 - c. Protect stormwater inlets that are functioning during the course of the development by approved BMP measures so that sediment-laden water cannot enter the inlets without first being filtered.
 - d. Apply permanent or temporary soil stabilization to denuded development site areas in conformance with the following schedule:
 - ❖ Between October 1 and May 31, all denuded sites shall be provided with either temporary or permanent soil stabilization as soon as practicable, but in no case more than 2 days after ground-disturbing activity occurs.
 - ❖ Between June 1 and September 30, temporary erosion and sediment control measures to reduce dust and sediment transport shall be applied as soon as practicable, but in no case more than seven days after ground-disturbing activity occurs.



- ❖ Groundcover shall be installed on any portion of a site that is denuded for more than six months. Sports fields or playgrounds surrounded by vegetative cover or permanently installed curbing are exempt from this requirement.
 - ❖ Temporary measures shall be maintained until permanent measures are established.
 - ❖ Plant appropriate non-invasive replacement vegetative cover.
 - ❖ Secure or protect soil stockpiles throughout the project with temporary or permanent soil stabilization measures. The responsible party is accountable for the protection of all stockpiles on the site, and those transported from the site. Depositions of soil may be subject to additional regulations requiring permit, review or erosion and sediment control.
 - ❖ Select appropriate BMPs from the Standard Drawings, ODOT Erosion Control Manual, the Clean Water Services Erosion Prevention and Sediment Control Planning and Design Manual, or other appropriate manual.
6. Existing vegetation shall be protected and left in place whenever practicable. Work areas shall be carefully located and marked to reduce potential damage to trees and existing vegetation. Trees shall not be used as anchors for stabilizing working equipment. Where required, trees and existing vegetation shall be protected with a non-movable, chain link fence.
7. Where existing vegetation has been removed, or the original land contours have been disturbed, the site shall be revegetated, and the vegetation established, as soon as practicable.

703.01.D ENFORCEMENT

703.01.E Failure to comply with any provision of this Section or with any term of a permit shall be deemed a violation and subject to enforcement action pursuant to applicable City ordinance and resolutions and orders, including all implementing rules and regulations. Nothing in this Section shall relieve any person of the obligation to comply with the regulations or permits of the City, County, State, or Federal authority.

703.02 EROSION AND SEDIMENT CONTROL PLAN (ESCP)

703.02.A GENERAL

1. An Erosion and Sediment Control Plan (ESCP) is a detailed description of where and how BMPs will be implemented to control erosion, sediment, and pollutants on a development site. The ESCP is a central, specific component of the overall site development management plan. The ultimate goal of erosion prevention is to limit the time and area of ground disturbance, keep pollutants separate from stormwater runoff, and establish permanent groundcover as quickly and thoroughly as possible.
2. An ESCP shall be developed by a professional knowledgeable in erosion and sediment control. The responsible party shall designate an individual to be responsible for onsite installation, maintenance, and removal of ESCP measures. The ESCP shall be submitted and approved prior to any ground disturbance. Construction projects with ground disturbance of one (1) or more acres will require a NPDES 1200-C or CN permit, as required by the Oregon Department of Environmental Quality.



3. A Certified Professional in Sediment and Erosion Control (CPESC) or a licensed Professional Engineer with the State of Oregon may be required to prepare the ESCP under a City issued permit for special sites or when a major plan revision is required because of site violations.

703.02.B ESCP DEVELOPMENT MINIMUM REQUIREMENTS

1. As part of the construction plans, an Erosion and Sediment Control Plan shall be developed in accordance with the following criteria and the Oregon DEQ guidelines. The ESCP shall meet the following minimum requirements:
 - ❖ Demonstrate compliance requirements set forth above in Section 701.01.
 - ❖ Show compliance with special requirements mandated by the City Engineer.
 - ❖ Identify any wetland, water body or outfalls within 200 feet of the ground-disturbing activity.
 - ❖ Provide a simplified narrative description of existing land uses and proposed land use. Provide a copy of any applicable land use review documents.
 - ❖ Provide clear delineation and approximate size of the area to be disturbed. Show existing and proposed ground contours. Provide drainage patterns for existing and final ground contours. In addition, provide drainage patterns for all intermediate contours throughout the length of the ground-disturbing activity.
 - ❖ Show drainage controls that will be used prior to installation of a final stormwater conveyance system.
 - ❖ Indicate the name and address of responsible parties, including the Developer and property owner.
 - ❖ Identify an emergency contact and telephone number.
 - ❖ Provide a preliminary activity schedule (general construction schedule), including anticipated start and completion dates for all sequencing of ground-disturbing activity and the associated dates for installation of erosion, sediment, and pollution control BMPs. The activity schedule shall indicate the timeframe for installation, maintenance, and removal of temporary BMPs. The applicant is responsible for notifying the City when site work will deviate from the preliminary schedule. The preliminary schedule can be modified through the designated site inspector as work on the site progresses.
 - ❖ Identify the application and maintenance of BMPs, including planning-level BMPs such as speed limits on interior roads.
 - ❖ Show the location of erosion and sediment control BMPs and their position in relation to ground-disturbing activities. Identify which BMPs, if any, are permanent controls. Provisions shall be made for the interception of all potential silt-laden runoff that could result from the site clearing and grading. Interception shall preclude any silt-laden runoff from discharging from the proposed land development to downstream properties. Interception shall cause all silt-laden runoff to be conveyed by open ditch or other means to whatever temporary facility is necessary to remove silt prior to discharge to downstream properties.
 - ❖ Identify development activities/areas with the potential to generate pollutants, such as vehicle maintenance, fueling, trash and debris collection, dewatering discharge, and topsoil or other material stockpiles. Note whether any of these activities will occur offsite.



- ❖ Provide a simplified site landscape plan that indicates the types and amounts of vegetation to be used and when and where the vegetation will be planted. Distinguish between temporary vegetative cover and permanent site landscaping.
- ❖ Indicate on the site plan all areas of non-disturbance and/or retention of existing vegetation.
- ❖ For structural erosion and sediment control BMPs, provide a detail of installation methods, including any sizing calculations (flow volumes, rates, etc.) or reference to BMPs outlined in the Standard Drawings or in the Oregon DEQ Construction Stormwater BMP Manual.
- ❖ Provide drainage calculations, when required by the City Engineer.

703.02.C ESCP REVIEW AND APPROVAL WHEN REQUIRED BY CITY PERMIT

- ❖ The City Engineer may deny a plan if it is determined that the plan does not meet the minimum ESCP requirements stated above and/or standard industry practices.
- ❖ Review of ESCPs will look for the following approval criteria:
 - Efforts to minimize area of disturbance.
 - Use of combination of BMP types, not just sediment controls. Good plans will include at least one type of BMP from each BMP group in the manual (site entry, perimeter, stormwater, erosion prevention, etc.).
 - Use of stabilized construction entrances away from the low points of sites. Use of multiple entrances for large sites.
 - A specific construction schedule.
 - Description of stormwater controls prior to storm sewer or infiltration system installation.
 - Description of vehicle storage, maintenance, and fueling practices. Designation of staging areas, if appropriate.
 - Description of designated and protected materials storage and stockpile areas.
 - Description of site inspection and maintenance requirements for all BMPs after any storm event.
- ❖ Approval of the ESCP is based on meeting the minimum requirements outlined in Subsection 703.03.B, in accordance with the anticipated site conditions and schedule. Approval of an Erosion and Sediment Control Plan by the City does not relieve the applicant's responsibility to ensure that the approved erosion control BMPs are constructed and maintained to contain sediment and pollutants on the construction site.
- ❖ During the construction period, measures in the ESCP shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment-laden water does not leave the site. Approval of a plan may be granted with or without restrictions. Restrictions on a plan may include, but shall not be limited to, the following:
 - Work is conducted only during a specified time of the year.
 - Only a portion of the work is approved.
 - Oversight by an erosion control professional is mandated.



703.02.D WET WEATHER MEASURES

1. On sites where vegetation and ground cover have been removed, vegetative ground cover shall be stabilized according to the DEQ approved ESCP and the 1200-C permit requirements.

703.02.E MAINTENANCE AND INSPECTIONS

1. The developer or designated person shall be required to provide ongoing inspection of erosion and sediment control measures throughout the life of the project. Inspections shall be in accordance with the DEQ approved ESCP and the 1200-C permit requirements.
2. The erosion and sediment control measures shall remain in place and be maintained in good condition until all disturbed soil areas are permanently stabilized by installation and establishment of landscaping, grass, or mulching, or are otherwise covered and protected from erosion.

703.02.F CITY INSPECTION OF EROSION CONTROL MEASURES

1. City Initial Inspection: On a site development or any other type of project, the erosion and sediment control measures shall be installed before the start of any permitted activity. The applicant shall coordinate with the City Engineer for a pre-construction conference before beginning any site clearing or grading.
2. City Final Inspection: A final erosion control inspection will be required before the removal of erosion and sediment control measurements. Site conditions must be permanently stabilized.

703.02.G ESCP DEVELOPMENT AND IMPLEMENTATION

1. The three principal parties involved in implementing an ESCP are the Designer, the Applicant or Designer's Inspector, and the Contractor. In addition to being responsible for reviewing the project's applicable NPDES 1200-C or CN permit and knowing what is required, each has the following corresponding project responsibilities, which include, but not limited to the following:
 - a. Designer Responsibilities:
 - ❖ Research construction project site conditions.
 - ❖ Ensure that topography and drainage are clearly delineated on the ESCP.
 - ❖ Understand the scope of the construction project including detour facilities, duration of construction, and time of year construction will commence.
 - ❖ Develop supplemental specifications as required to specify practices necessary to control erosion and contain sediment on site.
 - ❖ Provide an ESCP with proper erosion control items to address erosion and sediment throughout project construction.
 - ❖ Regularly update knowledge of the latest technology in commercial erosion control materials and methods.
 - ❖ Ensure that the specified erosion control products are readily available.



- b. Applicant or Designer's Inspector Responsibilities:
- ❖ Have knowledge and understanding of the project ESCP and environmental protection requirements.
 - ❖ Ensure that the Contractor submits revisions to the ESCP and presents the revised ESCP at the pre-construction meeting.
 - ❖ Ensure that the Contractor updates the ESCP as construction progresses.
 - ❖ Ensure that the Contractor maintains the erosion control facilities as needed.
 - ❖ Ensure that the Contractor completes monitoring reports weekly or after more than 0.5 inches (in) of rain in a 24-hour period during active projects and once every 2 weeks during inactive projects of more than 7 days, if required by the City.
 - ❖ Understand Sections 205 (Erosion Prevention and Sediment Control), 206 (Environmental Protections), and 213 (Landscape and Landscape Restoration of the Standard Construction Specifications for public improvement projects under City Contract.
 - ❖ Understand how to properly implement best management practices (BMPs) to control erosion and contain sediment.
 - ❖ Ensure that the Contractor and project complies with the NPDES 1200-C or CN Permit.
 - ❖ Be familiar with the Standard Drawings for erosion control.
- c. Contractor Responsibilities:
- ❖ Become knowledgeable about the latest technology to control erosion and contain sediment.
 - ❖ Be knowledgeable of site conditions.
 - ❖ Understand Sections 205 (Erosion Prevention and Sediment Control), 206 (Environmental Protections), and 213 (Landscape and Landscape Restoration of the Standard Construction Specifications for public improvement projects under City Contract
 - ❖ Revise the ESCP to meet conditions of construction (i.e., phasing, timing, weather) and present the revisions at the pre-construction meeting.
 - ❖ Develop a an ESCP that includes a site plan and narrative, describing methods of erosion and sediment control to be used to minimize erosion and sediment from project operations related to disposal sites, borrow pit operations, haul roads, equipment storage sites, fueling operations and staging areas.
 - ❖ Construct BMP's as described in the project ESCP and specifications.
 - ❖ Minimize clearing of vegetation and look for opportunities to minimize erosion, offering ideas to ODOT inspectors for approval.
 - ❖ Monitor erosion control devices.
 - ❖ Maintain erosion control facilities and modify when required to stay in compliance with NPDES 1200-C or CN Permit.
 - ❖ Update the ESCP as work progresses and modify plan as conditions change.
 - ❖ Ensure that permanent seeding is done within the time frames set forth in Section 213 of the Standard Construction Specifications for public improvement projects under City Contract.



703.03 EROSION PREVENTION TECHNIQUES AND MEASURES

703.03.A GENERAL

1. The use of erosion prevention techniques shall be emphasized, rather than measures to control sediment. This shall be especially important on construction sites immediately before and during the rainy season. Erosion prevention techniques are designed to protect soil particles from the force of rain and wind so they will not erode. When land is disturbed at a construction site, the erosion rate accelerates dramatically.
2. Erosion prevention techniques include, but are not limited to, construction scheduling, ground cover, and matting. Erosion prevention measures include, but are not limited to, silt fences, sediment barriers, and settling basins. Both erosion prevention techniques and sediment control measures have appropriate uses. Sediment control measures are designed to capture soil particles after they are dislodged and to retain the soil particles on site. Studies have shown, however, that sediment control measures are less effective than erosion prevention techniques in preventing soil movement.

703.03.B TYPICAL TECHNIQUES AND BEST MANAGEMENT PRACTICES TO BE IMPLEMENTED

1. The following provides a brief summary of some of the basic required erosion and sediment control techniques and measures to be implemented within the City. Refer to the Standard Drawings and the Oregon DEQ guidelines and other manuals as appropriate for additional information and for other best management practices (BMPs).
2. GENERAL EROSION CONTROL MEASURES
 - a. During periods of wet weather, disturbed areas of the site and/or stockpiled soil shall be covered by tarps or straw at the end of each day's operations; all disturbed, unworked areas of the site shall be protected from erosion.
 - b. Temporarily seed disturbed soils and slopes that are not at finished grade and which will be exposed for two months or longer before being disturbed again.
 - c. Where seeding is used for erosion control, Regreen® or equivalent, or sterile wheat shall be used to stabilize slopes until permanent vegetation is established.
 - d. Temporary seeding shall establish a minimum of 70% coverage of the ground surface with uniform healthy plants. If this coverage is not achieved, or if the City determines that it is not effective in stabilizing the soil from erosion, the applicant, at their expense, will be required stabilize the area with other temporary stabilization methods as approved by the City Engineer.
 - e. Biodegradable fabrics (Coir/Jute Matting), reinforced turf mats, or straw mulch can be used to stabilize slopes and channels. The fabrics can also be used to hold plugs in place and discourage floating upon inundation.
 - f. Permanent vegetation or seeding shall be established only between March 1 through May 15 and September 1 through October 15. If an irrigation system is installed, vegetation or seeding may be established from March 1 through November 15. If an area falls under definition of a wetland, permanent vegetation or seeding shall be established only between



March 1 through April 30 and September 1 through October 15 and in a manner satisfying applicable City, County, State and Federal requirements.

3. CONSTRUCTION ENTRANCE

- a. A gravel, paved, or constructed entrance is required. If there is more than one vehicle access point, a gravel, paved or constructed entrance shall be required at each entrance.
- b. The responsibility for design and performance of the driveway remains with the applicant. Vehicles or equipment shall not enter a property next to a stream, watercourse, stormwater or surface water facility, or wetlands unless adequate measures are installed to prevent physical erosion into the water or wetland.

4. SEDIMENT FILTERS AND FENCES

- a. The use of sediment fences will be required. Use of straw bales as a sediment filter, fence, or barrier is not allowed.

5. PLASTIC SHEETING

- a. Plastic sheeting may be used to protect small, highly erodible areas or temporary stockpiles of material until a more permanent stabilization can occur or until the stockpile is removed. If plastic sheeting is used, the path of concentrated flow from the plastic must be protected.

6. DUST PREVENTION

- a. During all phases of the work, the applicant shall take precautions to abate any dust nuisance. Dust-prevention measures shall be continuous until final inspection by the City Engineer. Dust shall be minimized to the extent practicable, using all measures necessary to accomplish results satisfactory to the City Engineer, including, but not limited to:
 - 1) Sprinkling haul and access roads and other exposed dust-producing areas with water.
 - 2) Applying City-approved dust palliatives on access and haul roads.
 - 3) Establishing temporary vegetative cover.
 - 4) Placing wood chips or other effective mulches on vehicle- and pedestrian-use areas.
 - 5) Maintaining proper moisture conditions on all fill surfaces.
 - 6) Prewetting cut and borrow area surfaces.
 - 7) Using covered haul equipment

7. BIOENGINEERING TECHNIQUES

- a. Any person performing work in a watercourse or in an environmentally sensitive area (e.g., essential salmonid habitat, wetlands, steep slopes) shall employ bioengineering techniques whenever feasible.
- b. Bioengineering techniques include, but are not limited to, contour wattling, brush layering or matting, live cuttings, fascines, and stakes.



704 EROSION AND SEDIMENT CONTROL MEASURES POST CONSTRUCTION REQUIREMENTS

- 704.01.A** All soil disturbance activities must be complete and no further soil disturbances will occur in conjunction with the project.
- 704.01.B** The site must have undergone final stabilization and a satisfactory vegetative coverage in accordance with the approved ESCP and permit requirements. Unless stated otherwise in the approved ESCP and/or permit, a satisfactory vegetative cover is as follows:
1. No bare spots larger than 2-square feet.
 2. Not more than 10 percent of the total area with bare spots larger than 1-square foot.
 3. Not more than 15 percent of the total area with bare spots larger than 6-inches square.
- 704.01.C** Removal and disposal of all temporary erosion and sediment controls unless otherwise directed.
- 704.01.D** Submit a written request for inspection of the vegetative cover to the City Engineer. Within 15-days of the request, the City Engineer will make an inspection of the site to determine if final stabilization has been achieved.
- 704.01.E** For projects with a 1200-C permit, a copy of the DEQ Notice of Termination shall be submitted to the city after completion of construction activities and final stabilization of the site.

END OF DIVISION



APPENDIX A

STANDARD DRAWINGS

DIVISION 2

Revision

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204 Typical utility Easement Widths	Sept 2021
206 Typical Trench Detail	Sept 2021
208 Typical Pipe Casing Detail	Sept 2021
210 Typical Gravity Pipe Anchor Block Detail	Sept 2021

DIVISION 3

302 Typical Alley Street Section	Sept 2021
304 Typical Street Section	Sept 2021
306 Typical Partial Street Section	Sept 2021
308 Typical Cul-De-Sac	Sept 2021
309 Typical Cul-De-Sac Eyebrow	Sept 2021
310 Hammer-Head Turnaround	Sept 2021
312 Pedestrian/Bicycle Multi-Use Path Access Way	Sept 2021
314 Recreational Trail	Sept 2021
316 Gravel and Native Surface Restoration	Sept 2021
318 Pavement Surface Restoration	Sept 2021
320 Pavement Connection Details	Sept 2021
322 Survey Monument Box	Sept 2021
324 Single Accessible Parking Space	Sept 2021
326 Double Accessible Parking Space	Sept 2021
328 International Symbol of Accessibility	Sept 2021
330 Typical Street Name and Stop Sign	Sept 2021
332 Mailbox Location	Sept 2021
334 Curb Knockout for Driveways	Sept 2021
336 Standard PCC Curb and Gutter and Straight Curbs	Sept 2021
337 Infill and Retrofit PCC Curb and Gutter and Straight Curbs	Sept 2021
338 Curb Drain Under Sidewalks	Sept 2021
340 Typical concrete Sidewalk	Sept 2021
342 Typical Sidewalk Around Obstructions	Sept 2021
344 Typical Property Line Sidewalk to Curblines Transition	Sept 2021
346 Driveway with Property Line Sidewalks	Sept 2021
348 Driveway with Curblines Sidewalks	Sept 2021
350 Curb Return for Commercial Driveway Approach	Sept 2021
352 Typical Driveway Approach for Unimproved Streets	Sept 2021
354 Intersection Ramps for Property Line Sidewalks	Sept 2021
356 Intersection Ramps for Curblines Sidewalks	Sept 2021
358 Parallel Sidewalk Ramps	Sept 2021
360 Typical Bollard	Sept 2021
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364 Typical Street Light Pole	Sept 2021
366 Street Barricade	Sept 2021
368 Street Tree and Shrub Planting	Sept 2021
370 Downtown Street Tree Well Grate Detail	Sept 2021
372 Downtown Street Tree Well Irrigation System	Sept 2021
374 Irrigation System Swing Joint Riser Assembly	Sept 2021



DIVISION 4

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404 Standard Straddle Block	Sept 2021
408 Gate Valve and Valve Box Assembly	Sept 2021
410 Butterfly Valve and Valve Box Assembly	Sept 2021
412 Valve Operating Nut Extension	Sept 2021
414 Standard Fire Hydrant Assembly	Sept 2021
416 Standard 2-Inch Blow-Off Assembly (Dead-End Main)	Sept 2021
418 Standard 2-Inch Blow-Off for Future Extension	Sept 2021
420 Standard Connection Assemblies	Sept 2021
422 Typical Waterline Undercrossing	Sept 2021
424 Temporary Main Line Chlorination Assembly	Sept 2021
426 Water Sampling Station	Sept 2021
428 1-Inch and 2-Inch Combination Air/Vacuum Release Valve	Sept 2021
430 ¾-Inch and 1-Inch Water Services	Sept 2021
432 1-1/2-Inch and 2-Inch Water Services	Sept 2021
434 Compound Water Meter Vault Detail 1 of 2	Sept 2021
436 Compound Water Meter Vault Detail 2 of 2	Sept 2021
438 Minimum Protection for Filling Tanker Truck	Sept 2021

DIVISION 5

502 Standard Manhole	Sept 2021
504 Standard Manhole for Large Diameter Pipes	Sept 2021
506 Standard Shallow Flat top Manhole	Sept 2021
508 Standard Outside Drop Manhole	Sept 2021
510 Standard Inside Drop Manhole	Sept 2021
512 Standard Flow Monitoring Manhole	Sept 2021
514 Cast-in-Place Manhole Base	Sept 2021
516 Manhole Frame and Cover	Sept 2021
518 Tamperproof and Waterproof Frame and Cover	Sept 2021
520 Manhole Frame and Cover Adjustment	Sept 2021
522 Manhole Access Locations	Sept 2021
524 Manhole Step Detail	Sept 2021
526 Mainline Cleanout Detail	Sept 2021
528 Sanitary Drain Service Laterals	Sept 2021
530 Insert-A-Tee Connections	Sept 2021
532 Grease Interceptor	Sept 2021

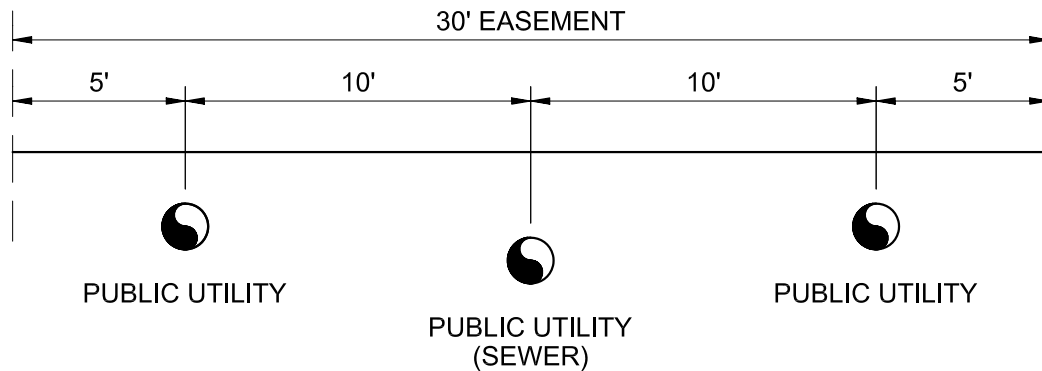
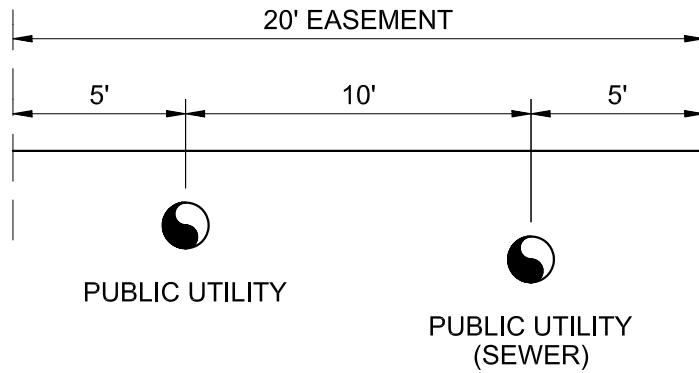
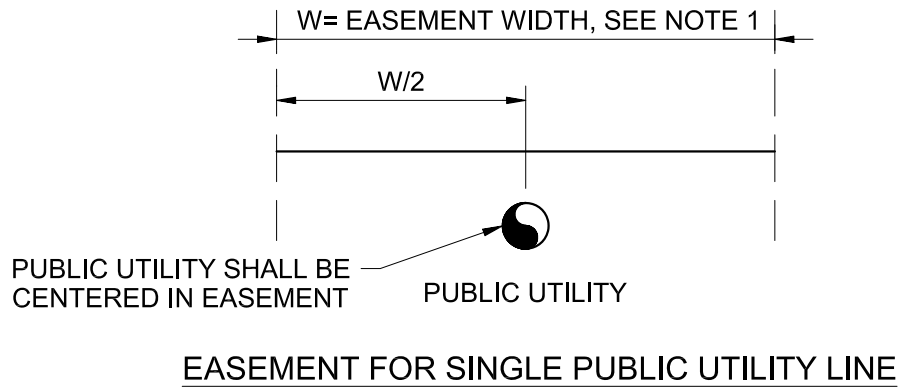
DIVISION 6

602 Side-Inlet Catch Basin (CG-2)	Sept 2021
604 Side-Inlet Catch Basin Frame and Grate	Sept 2021
606 Curb Inlet Top Section	Sept 2021
608 Curb Inlet Base Section	Sept 2021
610 Ditch Inlet (Type D)	Sept 2021
612 Area Drainage Basin or Field Inlet	Sept 2021
614 Pollution Control Box	Sept 2021
616 "Snout" Oil and Debris Stop	Sept 2021
618 Storm Drain Water Quality Manhole (Type 1)	Sept 2021
620 Storm Drain Water Quality Manhole (Type 2)	Sept 2021
622 Storm Drain Flow Control Manhole	Sept 2021
624 Typical Underground Detention Pipe	Sept 2021
626 Sand and Oil/Water Separator	Sept 2021



DIVISION 7

702 Gravel Construction Entrance	Sept 2021
704 Biofilter Bag Inlet Protection	Sept 2021
706 Polypropylene Bag Inlet Protection	Sept 2021
708 Sediment Fence	Sept 2021
710 Straw Wattles	Sept 2021
712 Sediment Trap	Sept 2021
714 Biofilter Bag Check Dams	Sept 2021
716 Rock Check Dams	Sept 2021
718 Channel Matting Installation	Sept 2021
720 Slope Matting Installation	Sept 2021
722 Temporary Plastic Sheeting Stockpile Covering	Sept 2021
724 Concrete Washout	Sept 2021
726 Riprap Outlet Protection	Sept 2021



NOTES:

1. MINIMUM EASEMENT WIDTHS FOR VARIOUS UTILITIES ARE:
 WATER W=15'
 STORM DRAIN W=15'
 SANITARY SEWER W=15'
2. AN INCREASE IN EASEMENT WIDTH MAY BE REQUIRED FOR ANY PUBLIC UTILITY THAT IS OVER 10' DEEP OR OVER 24" IN DIAMATER.
3. WITH THE EXCEPTION OF UTILITY CROSSINGS, PRIVATE UTILITY LINES MAY NOT BE LOCATED WITHIN THE PUBLIC UTILITY EASEMENTS.
4. NO STRUCTURES, INCLUDING DECKS AND OVERHANG AREAS, MAY ENCROACH INTO THE EASEMENT AREA.



DEPARTMENT OF PUBLIC WORKS

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STANDARD DRAWING TITLE

**TYPICAL UTILITY
 EASEMENT WIDTHS**

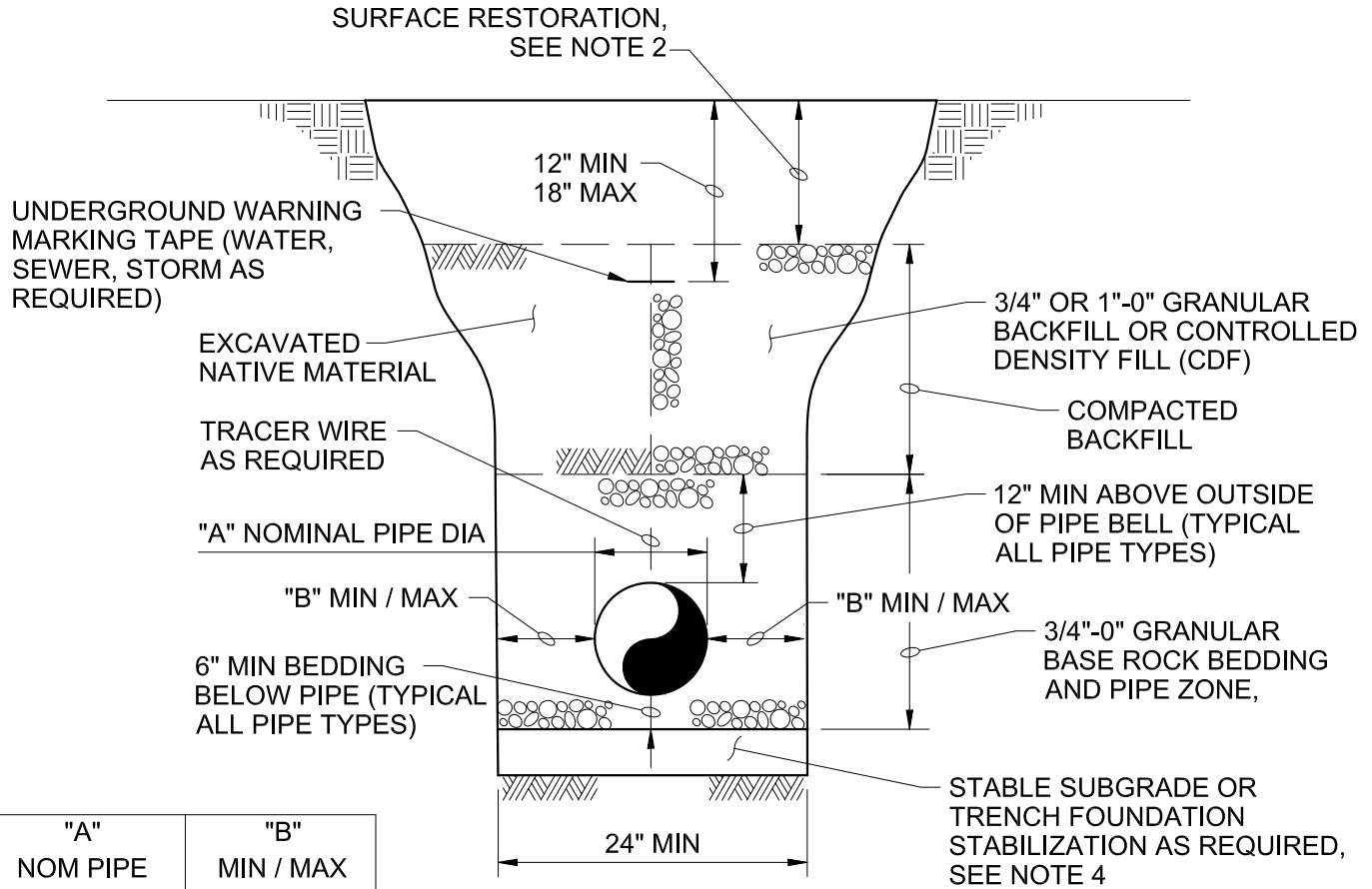
NO SCALE

DIVISION

GENERAL

DRAWING NO.

204



"A" NOM PIPE DIAMETER	"B" MIN / MAX CLEARANCE
<10"	10" / 18"
12" - 16"	12" / 18"
18" - 21"	16" / 24"
24" - 30"	18" / 30"
>30"	24" / 36"

NOTES:

1. SEE PLANS AND STANDARD CONSTRUCTION SPECIFICATIONS FOR TYPICAL TRENCH COMPACTION REQUIREMENTS. BEDDING AND PIPE ZONE SHALL BE COMPACTED TO A MINIMUM 90% PER AASHTO T-180.
2. FOR TYPICAL TRENCH SURFACE RESTORATION, SEE STANDARD DRAWINGS 304, 316 AND 318.
3. PIPE ZONE SHALL BE EXTENDED TO A MINIMUM 12-INCHES ABOVE OUTSIDE OF THE PIPE BELL, REGARDLESS OF THE TYPE OF PIPE MATERIAL INSTALLED. BEDDING AND PIPE ZONE MATERIAL SHALL BE COMPACTED, AS SPECIFIED, PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
4. PIPE BEDDING SHALL BE PLACED ON STABLE SUBGRADE. WHEN REQUIRED, OR AS DIRECTED BY CITY ENGINEER, GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON EXISTING SOIL CONDITIONS.
5. FOR FLEXIBLE PIPE INSTALLATIONS, BOTTOM OF THE TRENCH SHORING SHALL BE ABOVE THE PIPE SPRINGLINE, PRIOR TO COMPACTING BEDDING AND PIPE ZONE MATERIAL UNDER THE PIPE HAUNCHES.



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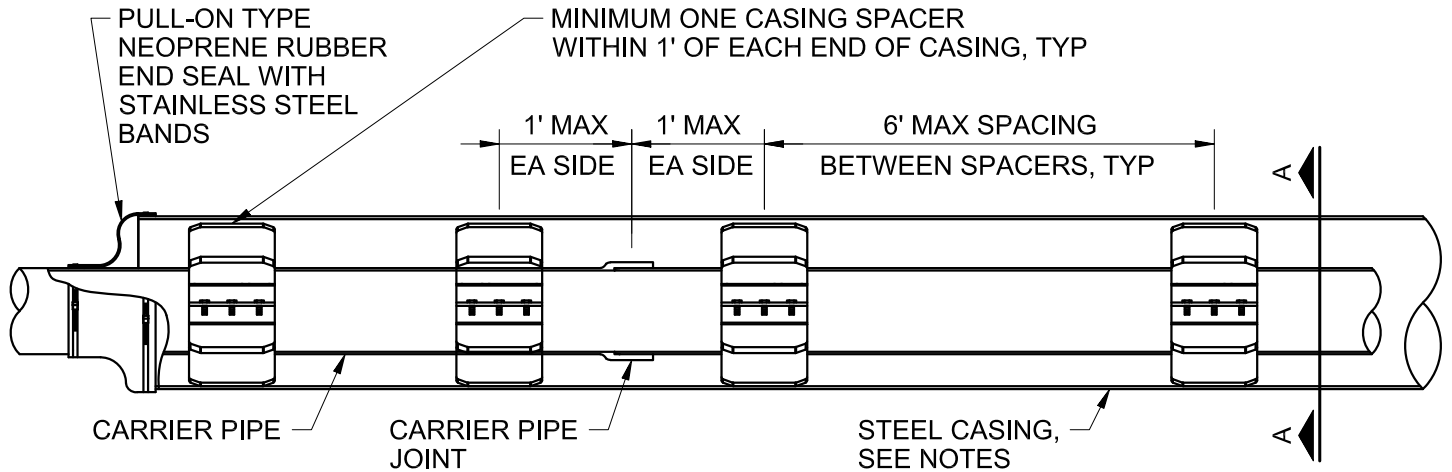
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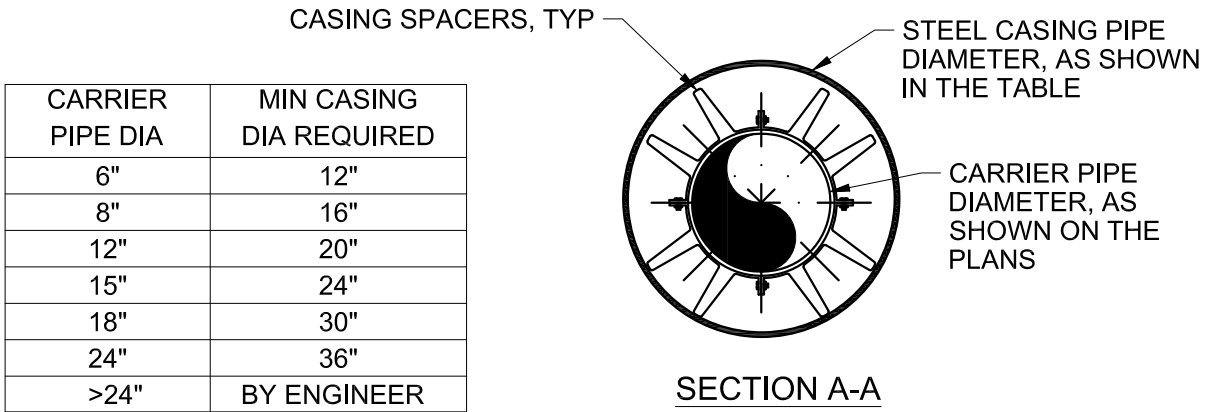
**TYPICAL TRENCH
DETAIL**

NO SCALE
DIVISION
GENERAL
DRAWING NO.

206



END DETAIL




CARRIER PIPE DIA	MIN CASING DIA REQUIRED
6"	12"
8"	16"
12"	20"
15"	24"
18"	30"
24"	36"
>24"	BY ENGINEER

SECTION A-A

NOTES:

1. BORING SHALL BE AT 90 DEGREES TO ALL CROSSINGS UNLESS OTHERWISE APPROVED. THE BORING OF THE HOLE AND INSTALLATION OF THE CASING PIPE SHALL BE SIMULTANEOUS. BORE HOLE DIAMETER SHALL ESSENTIALLY BE THE SAME AS THE OUTSIDE DIAMETER OF THE CASING PIPE TO BE INSTALLED.
2. STEEL PIPE CASING SHALL BE SMOOTH STEEL PIPE FABRICATED IN SECTIONS IN ACCORDANCE WITH AWWA C201. LENGTHS OF CASING PIPE SHALL BE AS LONG AS PRACTICAL FOR SITE CONDITIONS.
3. JOINTS SHALL CONFORM TO THE REQUIREMENTS OF AWWA C206. JOINTS BETWEEN SECTIONS SHALL BE COMPLETELY WELDED TO THE PRECEDING SECTIONS. PRIOR TO WELDING JOINTS, THE CONTRACTOR SHALL ENSURE THAT BOTH ENDS OF THE CASING SECTIONS BEING WELDED ARE SQUARE.
4. STEEL PIPE CASING WALL THICKNESS SHALL BE AS SPECIFIED. VERIFY CASING SIZES PRIOR TO ORDERING AND SIZING CASING INSULATORS.
5. CASING SPACERS SHALL RESTRAINED-TYPE BOLTED SPACERS AND SHALL HAVE A MAXIMUM SPACING AS SHOWN, OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS CLOSER. PIPE CASING SPACERS SHALL BE AS MANUFACTURED BY PIPELINE SEAL AND INSULATOR, INC., ADVANCE PRODUCTS AND SYSTEMS, INC., CALPICO, CASCADE WATER WORKS MFG, INC., OR APPROVED EQUAL.
6. CASING END SEALS SHALL BE SYNTHETIC NEOPRENE RUBBER PULL-ON TYPE END SEALS WITH STAINLESS STEEL BANDS, AS MANUFACTURED BY THE ABOVE MANUFACTURERS, OR APPROVED EQUAL.



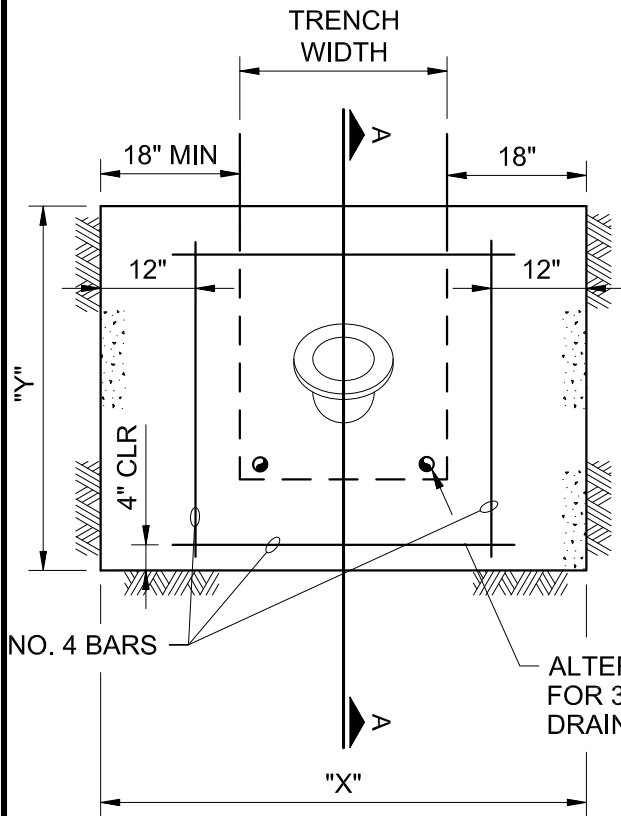
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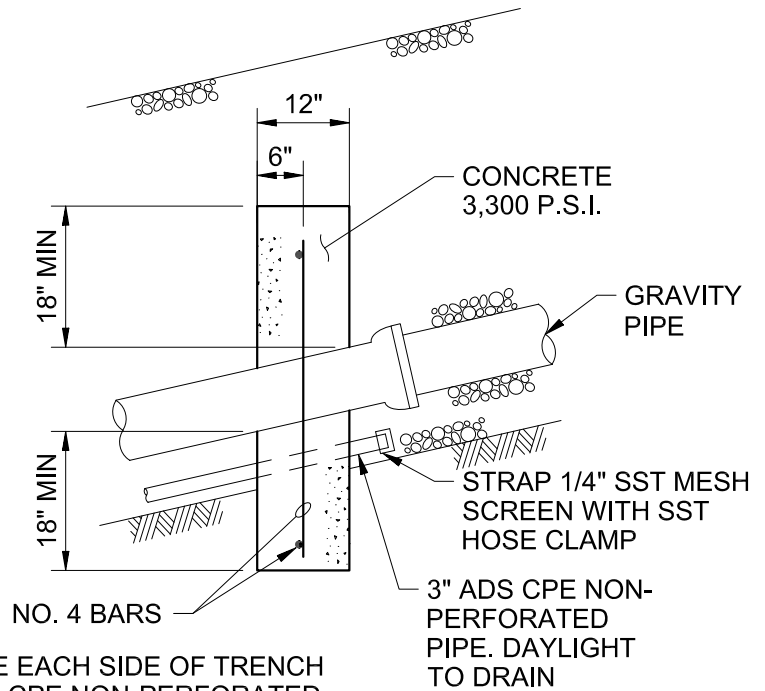
STANDARD DRAWING TITLE

TYPICAL PIPE CASING DETAIL

NO SCALE
DIVISION
GENERAL
DRAWING NO.
208



ELEVATION



SECTION A-A

SPACING FOR ANCHOR BLOCK FOR ALL SIZES


SLOPE %	MINIMUM SPACING (ft)
0 - 15	NO ANCHOR REQUIRED
15 - 35	35'
35 - 50	25'
> 50	BY DESIGN ENGINEER

ANCHOR BLOCK DIMENSION TABLE

PIPE DIA	"X", MIN (ft)	"Y", MIN (ft)
6"-10"	5'	4'
12"-15"	6'	5'
> 15"	BY DESIGN ENGINEER	

NOTES:

1. CONCRETE GRAVITY PIPE ANCHOR BLOCK SHALL BE CONSTRUCTED USING FORMS WHEN SANITARY SEWERS, STORM DRAINS, AND OTHER PIPELINES ARE CONSTRUCTED WITH SLOPES OVER 15%. REMOVE FORMS PRIOR TO BACKFILLING TRENCH.
2. FOR PIPES LARGER THAN 15", ANCHOR BLOCK SHALL BE DESIGNED BY THE DESIGN ENGINEER.
3. ANCHOR BLOCK SHALL ALWAYS BE LOCATED ALONG THE BARREL OF THE PIPE AND NOT AT THE JOINT.
4. INSTALL ONE 3" ADS CPE NON-PERFORATED DRAIN PIPE AT BOTTOM OF TRENCH SECTION DOWN THE SLOPE. ALTERNATE 3" DRAIN ON EACH SIDE OF TRENCH SECTION AND DAYLIGHT TO DRAIN. INSTALL 1/4" STAINLESS STEEL MESH SCREEN USING STAINLESS STEEL HOSE CLAMPS OVER UPSTREAM END.
5. OTHER PIPE SLOPE ANCHOR SYSTEMS WILL BE CONSIDERED FOR CITY ENGINEER APPROVAL UPON REQUEST.



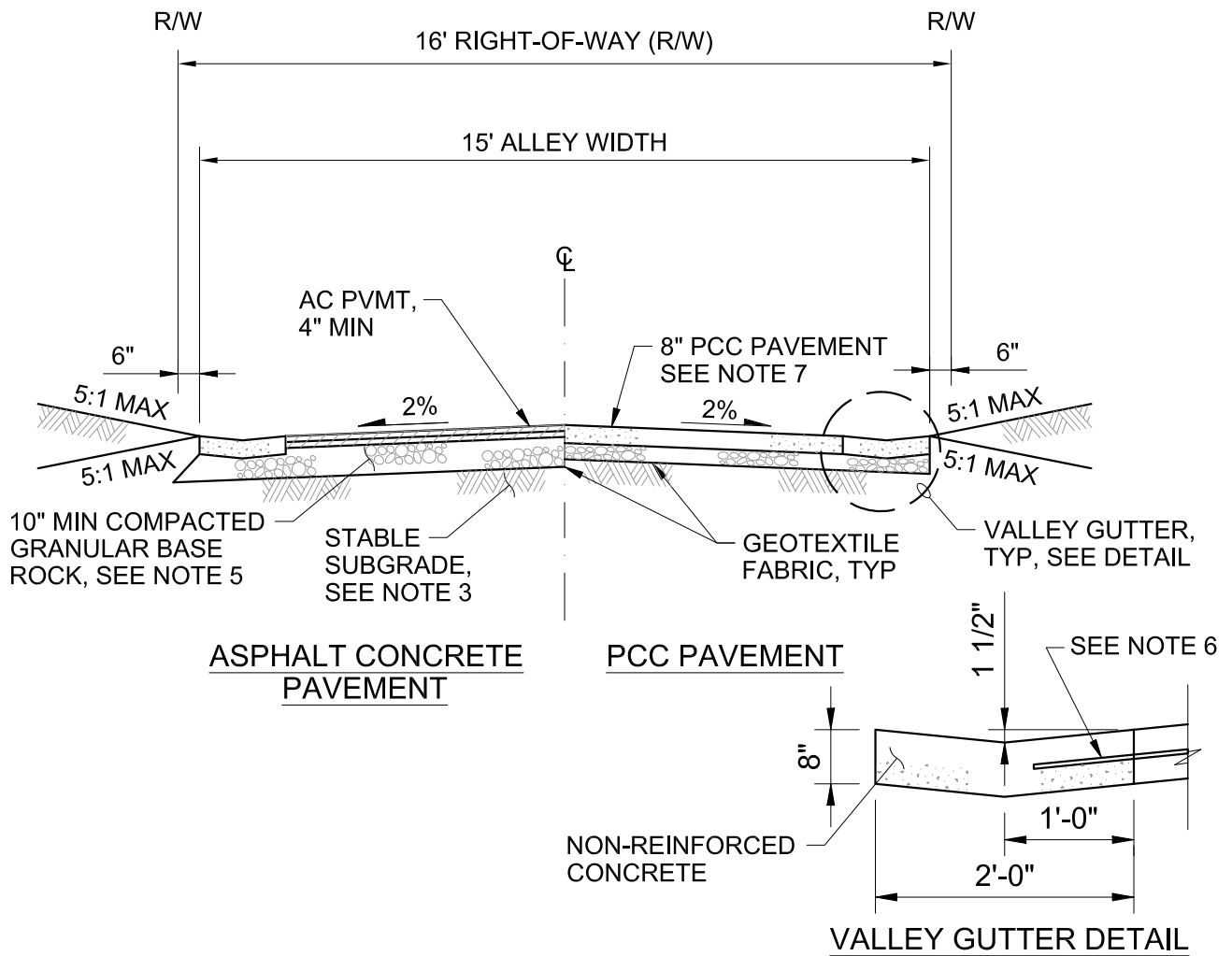
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TYPICAL GRAVITY PIPE ANCHOR BLOCK DETAIL


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DRAWING NO.
210



NOTES:

1. "NO PARKING" SIGNS SHALL BE POSTED THE ENTIRE LENGTH OF ALLEY.
2. FIRE HYDRANTS, WHEN REQUIRED, ARE TO BE LOCATED OUTSIDE THE RIGHT-OF-WAY IN A MINIMUM 5' x 5' EASEMENT.
3. SUBGRADE SHALL BE PREPARED, COMPACTED, AND PROOF-ROLLED PRIOR TO PLACEMENT OF GEOTEXTILE AND BASE ROCK, AS SPECIFIED. SUBGRADE SHALL BE PROTECTED FROM DAMAGE DUE TO WEATHER AND CONSTRUCTION TRAFFIC.
4. AC PAVEMENT THICKNESS SHALL BE 4" MINIMUM AND SHALL BE 1/2" DENSE ASPHALT COMPACTED IN EQUAL LIFTS TO MINIMUM OF 91% OF OPTIMUM PER AASHTO T-209. ALL EDGES AND COMPLETED LIFTS SHALL BE TACK COATED PRIOR TO PAVING. ALL JOINTS SHALL BE SAND SEALED AFTER COMPLETION.
5. BASE ROCK SHALL BE 1"-0" GRANULAR BASE ROCK COMPACTED TO A MINIMUM 95% PER AASHTO T-180.
6. ALL CONCRETE SHALL BE CLASS 5,000 PSI. MAX SLUMP SHALL BE 3" UNLESS OTHERWISE SPECIFIED. ALLEY MAY BE POURED MONOLITHICALLY OR GUTTER SECTIONS MAY BE PLACED SEPARATELY AS SHOWN. IF THE SECTIONS ARE PLACED SEPARATELY, THE CONSTRUCTION JOINT SHALL BE DOWELED EVERY 2' WITH 1/2" x 18" LONG DEFORMED REBAR DOWELS CENTERED AT THE JOINT.
7. SEE THE STANDARD CONSTRUCTION SPECIFICATIONS FOR INSTALLATION AND SURFACING REQUIREMENTS.
8. AN INVERTED CROWN ALLEY SECTION SHALL BE PROVIDED WHEN REQUIRED BY THE CITY ENGINEER.

DEPARTMENT OF PUBLIC WORKS



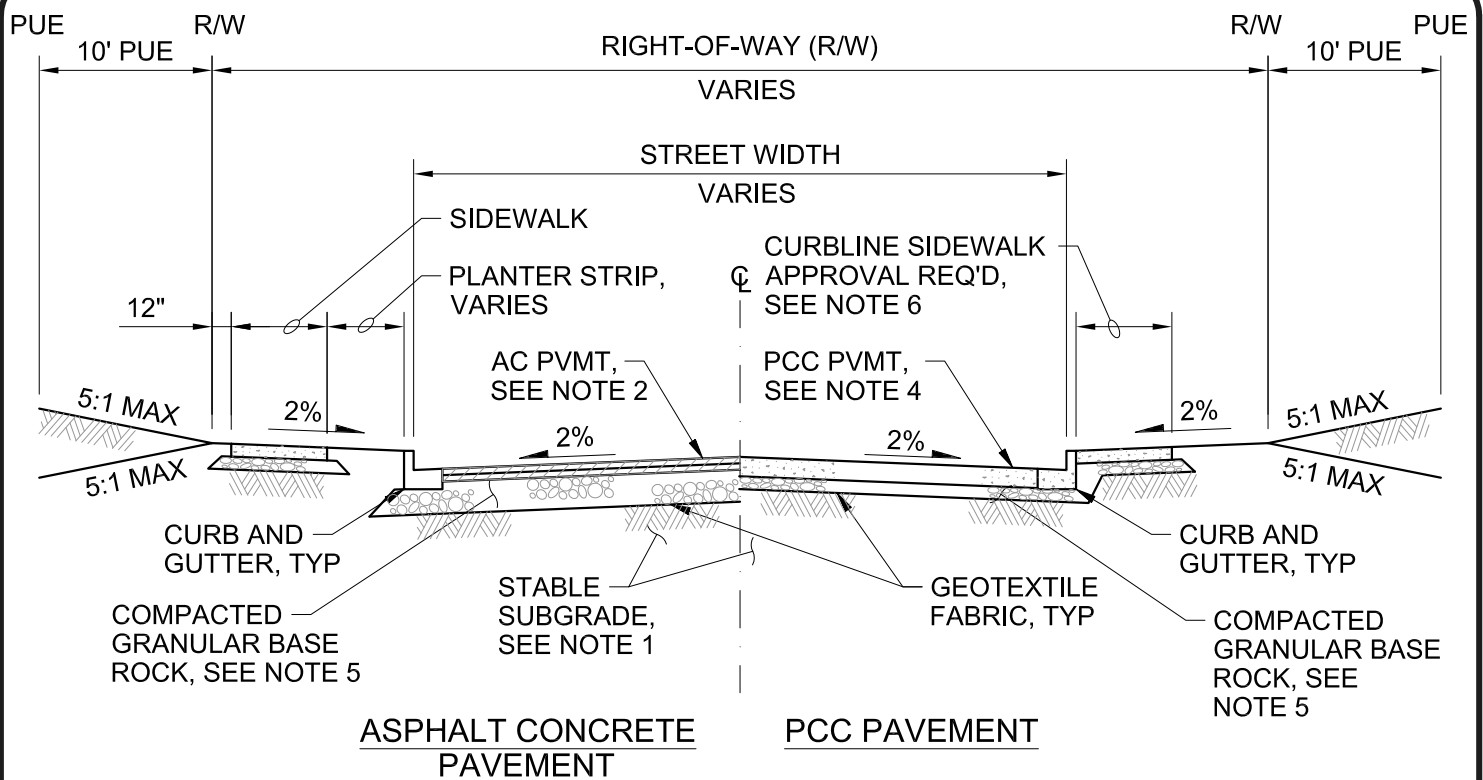
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TYPICAL ALLEY STREET SECTION

NO SCALE
DIVISION
STREET
DRAWING NO.
302




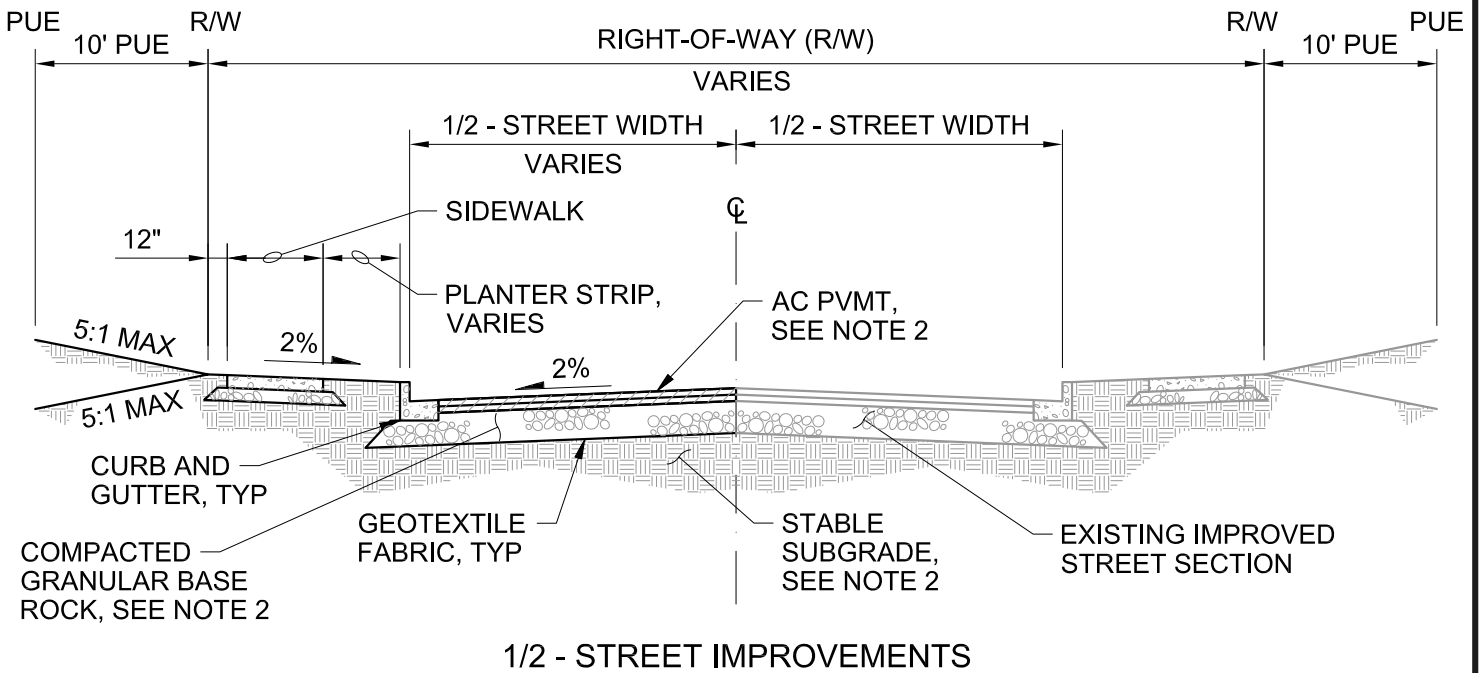
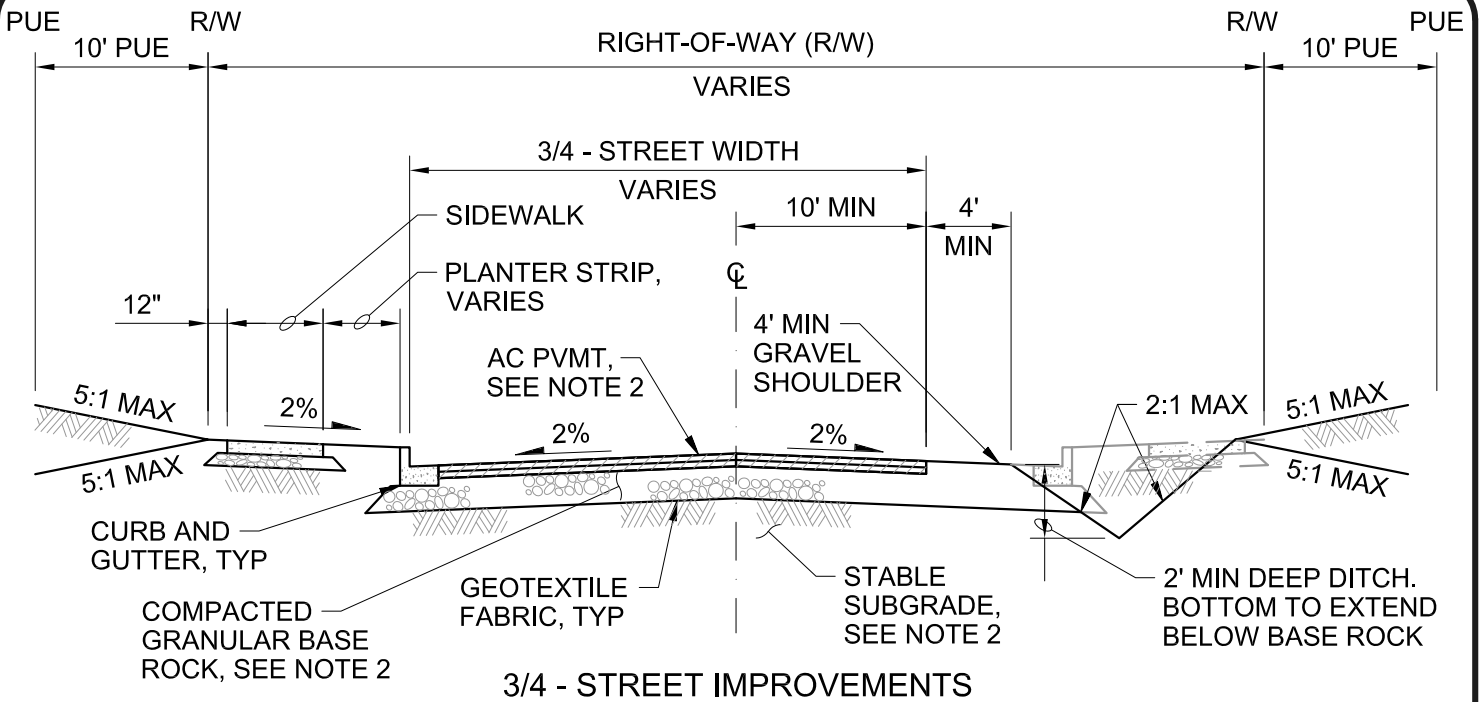
STREET SECTION	LOCAL STREETS	COLLECTOR STREETS	ARTERIAL STREETS
AC PAVEMENT W/ BASE ROCK	4" AC PVMT, LEVEL 2 10" BASE ROCK	5" AC PVMT, LEVEL 3 12" BASE ROCK	7" AC PVMT, LEVEL 3 15" BASE ROCK
PCC PAVEMENT W/ BASE ROCK	7" PCC PVMT 4" BASE ROCK	8" PCC PVMT 4" BASE ROCK	9" PCC PVMT 4" BASE ROCK

TABLE 1 - TYPICAL PAVEMENT STRUCTURE

NOTES:


- SUBGRADE SHALL BE PREPARED, COMPACTED, AND PROOF-ROLLED PRIOR TO PLACEMENT OF GEOTEXTILE AND BASE ROCK, AS SPECIFIED. SUBGRADE SHALL BE PROTECTED FROM DAMAGE DUE TO WEATHER AND CONSTRUCTION TRAFFIC.
- AC PAVEMENT THICKNESS SHALL BE AS SHOWN IN TABLE 1 AND SHALL BE CLASS "C" ASPHALT COMPACTED IN EQUAL LIFTS (3" MAX) TO MINIMUM OF 91% OF OPTIMUM PER AASHTO T-209. ALL EDGES AND COMPLETED LIFTS SHALL BE TACK COATED PRIOR TO PAVING. ALL JOINTS SHALL BE SAND SEALED AFTER COMPLETION.
- DESIGN ENGINEER MAY BE REQUIRED TO SUBMIT ASPHALT PAVEMENT DESIGN DATA FOR ANY STREET CITY ENGINEER HAS REASON TO SUSPECT UNSUITABLE SOIL CONDITIONS, HIGH PERCENTAGE OF TRUCKS, OR ANY OTHER CONDITIONS THAT MAY SIGNIFICANTLY AFFECT THE PAVEMENT DESIGN.
- PCC PAVEMENT SHALL BE 5,000 PSI AT 28 DAY STRENGTH. THICKNESS SHALL BE AS SHOWN IN TABLE 1.
- BASE ROCK SHALL BE 1"-0" GRANULAR BASE ROCK COMPACTED TO A MINIMUM 95% PER AASHTO T-180. BASE ROCK THICKNESS SHALL BE AS SHOWN IN TABLE 1.
- STREET TYPICAL SECTION SHALL HAVE PROPERTY LINE SIDEWALKS, AS SHOWN. CURBLINE SIDEWALKS ARE NOT PERMITTED WITHOUT CITY ENGINEER APPROVAL. SEE STANDARD DRAWING 340.
- FOR TYPICAL UTILITY LOCATIONS, SEE STANDARD DRAWING 202.

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	<p>REVISIONS</p>		<p>DIVISION</p>
			<p>STREET</p>
			<p>DRAWING NO.</p> <p>304</p>



NOTES:

1. STREET TYPICAL PARTIAL SECTION SHALL HAVE PROPERTY LINE SIDEWALKS, AS SHOWN. CURBLINE SIDEWALKS ARE NOT PERMITTED WITHOUT CITY ENGINEER APPROVAL. SEE STANDARD DRAWING 340.
2. FOR TYPICAL STREET SECTION AND NOTES, SEE STANDARD DRAWING 304.
3. FOR TYPICAL UTILITY LOCATIONS, SEE STANDARD DRAWING 202.
4. THE STORMWATER COLLECTION SYSTEM, INCLUDING SIDE INLET CATCH BASINS, SHALL BE CONSTRUCTED WITH PARTIAL STREET IMPROVEMENTS.



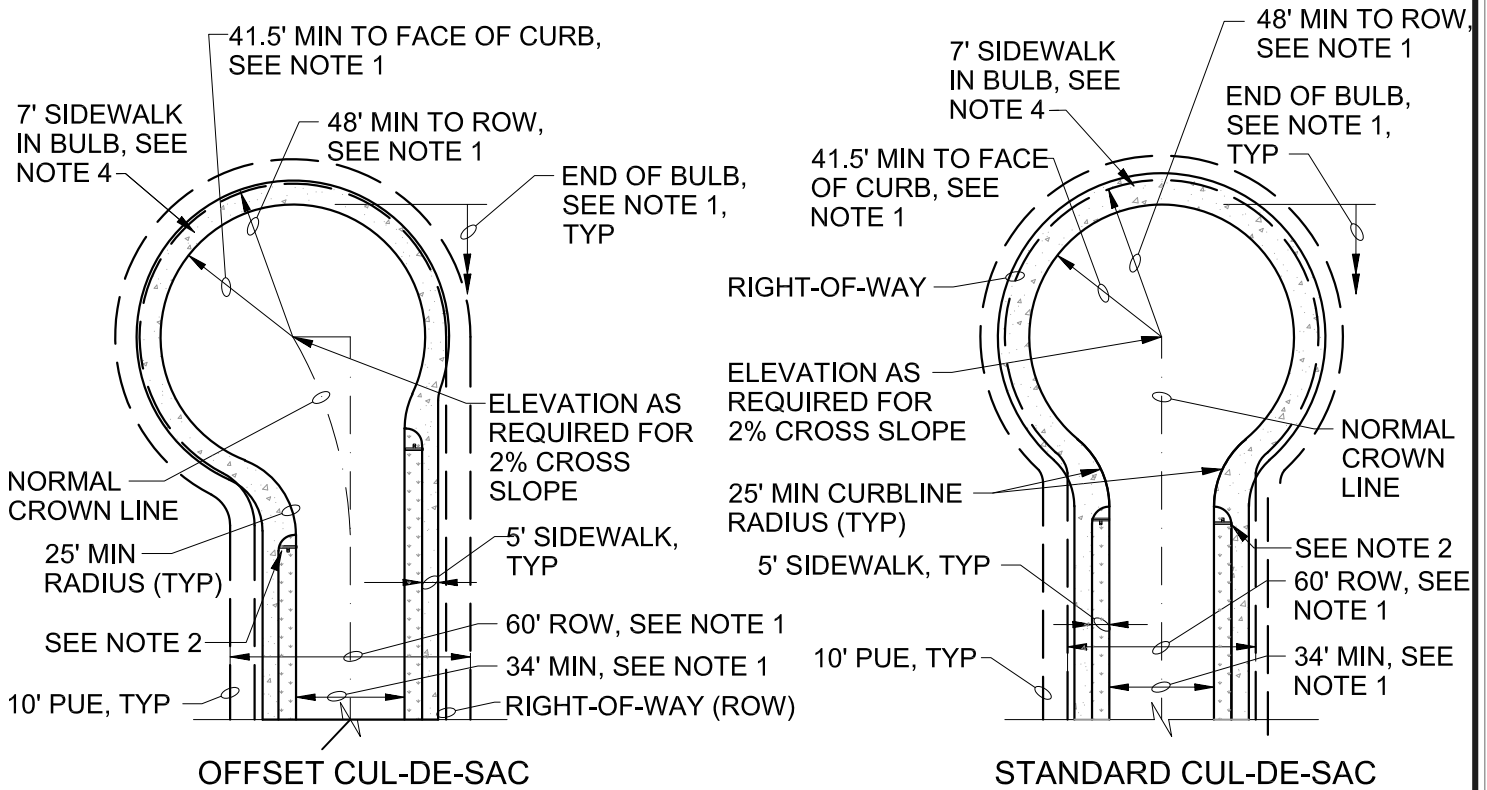
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TYPICAL PARTIAL STREET SECTION

NO SCALE
DIVISION
STREET
DRAWING NO.
306



NOTES:

1. WHEN CUL-DE-SACS ARE 200' OR LONGER TO THE END OF THE BULB, STREET SECTION SHALL BE AS SHOWN. WHEN CUL-DE-SACS ARE LESS THAN 200' TO THE END OF THE BULB (SHORT CUL-DE-SAC), THE STREET SECTION SHALL BE 30' WIDE BETWEEN FACE OF CURBS LOCATED WITHIN A 50' RIGHT-OF-WAY (ROW). CUL-DE-SAC BULB RADIUS AND RIGHT-OF-WAY SHOWN IS FOR LOCAL RESIDENTIAL STREETS ONLY. INDUSTRIAL STREET CLASSIFICATIONS SHALL BE 60' MINIMUM BULB RADIUS WITHIN A 80' RIGHT-OF-WAY.
2. "NO PARKING BEYOND THIS POINT" SIGNS SHALL BE INSTALLED AT BOTH SIDES OF CUL-DE-SAC BULB ENTRANCE AS SHOWN.
3. A 2% MIN CROSS SLOPE IS REQUIRED FROM CENTER OF BULB TO GUTTER. MINIMUM GUTTER SLOPE SHALL BE 0.5%.
4. SIDEWALKS ARE TO BE 7' WIDE CURB TIGHT, 6" THICK, WITHIN CUL-DE-SAC BULBS WITH TRANSITIONS AT THE CUL-DE-SAC PC. A 1' SIDEWALK EASEMENT WILL BE REQUIRED. SEE STANDARD DRAWING 344 FOR TRANSITION DETAILS.



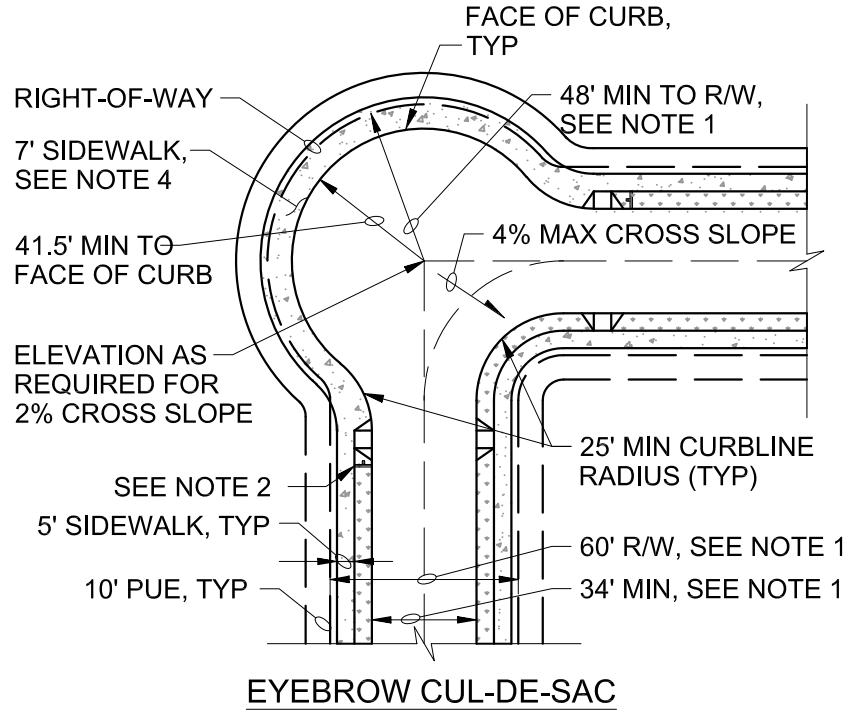
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TYPICAL CUL-DE-SAC

NO SCALE
DIVISION
STREET
DRAWING NO.
308



NOTES:

1. CUL-DE-SAC BULB RADIUS AND RIGHT-OF-WAY SHOWN IS FOR LOCAL RESIDENTIAL STREETS ONLY. INDUSTRIAL STREET CLASSIFICATIONS SHALL BE 60' MINIMUM BULB RADIUS WITHIN A 80' RIGHT-OF-WAY.
2. "NO PARKING BEYOND THIS POINT" SIGNS SHALL BE INSTALLED AT BOTH SIDES OF CUL-DE-SAC BULB ENTRANCE AS SHOWN.
3. A 2% MIN CROSS SLOPE IS REQUIRED FROM CENTER OF BULB TO GUTTER. MINIMUM GUTTER SLOPE SHALL BE 0.5%.
4. SIDEWALKS ARE TO BE 7' WIDE CURB TIGHT, 6" THICK, WITHIN CUL-DE-SAC BULBS WITH TRANSITIONS AT THE CUL-DE-SAC PC. A 1' SIDEWALK EASEMENT WILL BE REQUIRED. SEE STANDARD DRAWING 344 FOR TRANSITION DETAILS.



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**TYPICAL
CUL-DE-SAC
EYEBROW**

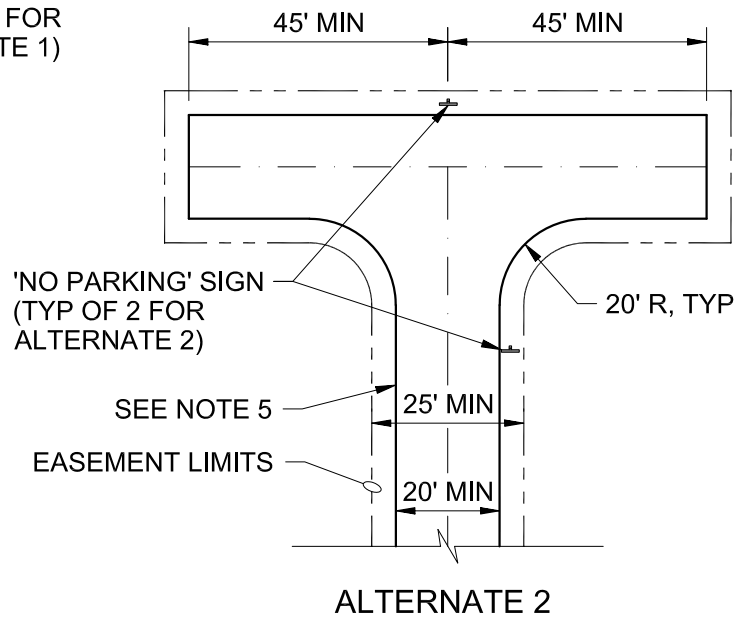
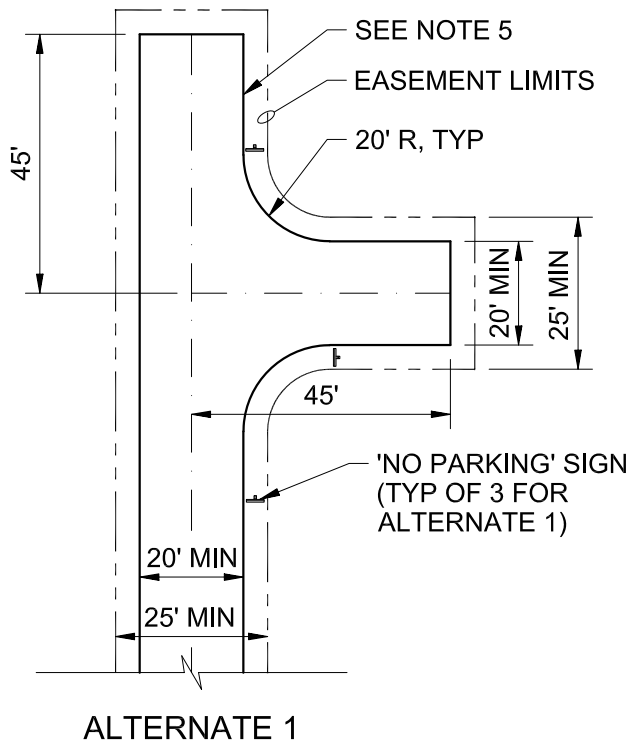
NO SCALE

DIVISION

STREET

DRAWING NO.

309



NOTES:

1. THE USE OF THIS HAMMER-HEAD TURNAROUND WILL BE LIMITED TO CERTAIN APPLICATIONS AND WILL REQUIRE APPROVAL OF THE CITY ENGINEER.
2. THE MAXIMUM LENGTH OF A PRIVATE STREET WITH THIS HAMMER-HEAD TURNAROUND SHALL BE 150 FEET TO THE END OF THE TURNAROUND. DEAD END PRIVATE STREETS IN EXCESS OF 150 FEET SHALL MEET THE CITY AND THE FIRE DISTRICT ACCESS, TURN-OUT, AND TURNAROUND STANDARDS.
3. "NO PARKING" SIGNS ARE REQUIRED WITHIN THE ACCESS EASEMENT LIMITS AND TURNAROUND AREA AS SHOWN.
4. A "PRIVATE STREET" SIGN SHALL BE POSTED AT THE ENTRANCE TO THE DEAD-END STREET.
5. PAVEMENT DIMENSIONS SHOWN ARE TO EDGE OF PAVEMENT OR FACE OF CURB.
6. FIRE HYDRANTS SHALL NOT BE LOCATED WITHIN PRIVATE STREETS HAVING A HAMMER-HEAD TURNAROUND, UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
7. DESIGNS SHOWN ARE TYPICAL MINIMUM DESIGNS. ALTERNATE DESIGNS SHALL MEET THE APPROVAL OF THE CITY ENGINEER.



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**HAMMER-HEAD
TURNAROUND**

(FOR PRIVATE STREETS ONLY)

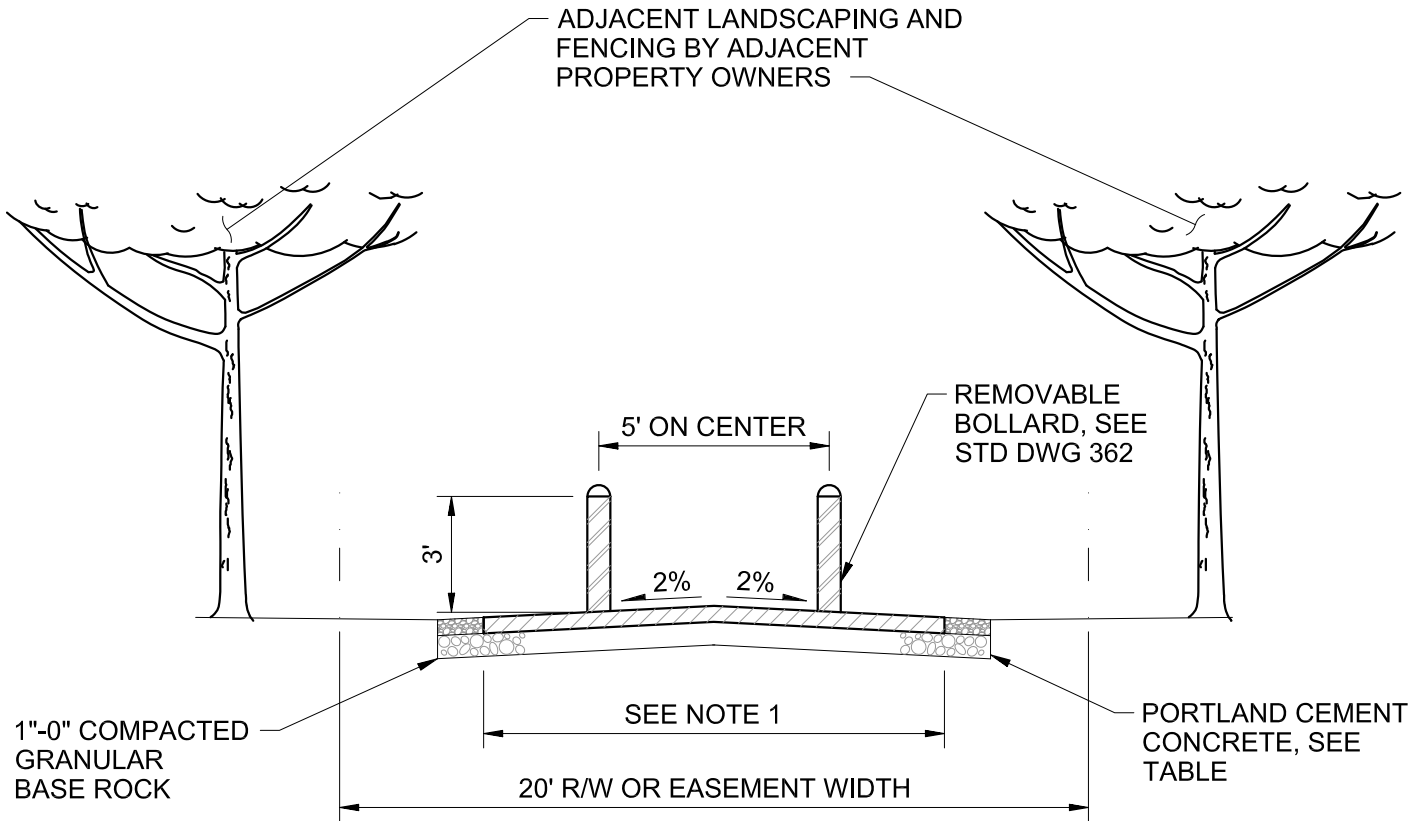
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DIVISION

STREET

DRAWING NO.

310




USE	GRANULAR BASE ROCK	CONCRETE THICKNESS	CONCRETE STRENGTH	REINFORCEMENT
NON-VEHICULAR*	4" MIN	4" MIN	3,300 PSI	N/A
HEAVY VEHICLE	4" MIN	8" MIN	5,000 PSI	10 GA. WIRE 6" O.C.

* SEE DESIGN STANDARDS FOR SURFACING OF RECREATIONAL TRAILS, PARK, AND NATURAL AREAS.

NOTES:

- MULTI-USE PATHS FOR PEDESTRIAN AND BICYCLISTS SHALL BE 8' WIDE CONCRETE WITH 2' WIDE GRAVEL SHOULDERS. MULTI-USE PATHS THAT ALSO PROVIDE SECONDARY FIRE AND/OR UTILITY MAINTENANCE VEHICLE ACCESS SHALL BE A MINIMUM OF 12' WIDE CONCRETE WITH 2' WIDE GRAVEL SHOULDERS. PATH SHALL BE CENTERED IN RIGHT-OF-WAY OR EASEMENT.
- IF THE RIGHT-OF-WAY OR EASEMENT IS WIDER THAN 20', THEN THE SHOULDERS SHALL HAVE A WEED BARRIER PLACED ON THE SUBGRADE AND BE COVERED BY 6" MINIMUM OF 3/4"-0 GRANULAR BASE ROCK COMPACTED TO 95% PER AASHTO T-180, OR SHALL BE PORTLAND CEMENT CONCRETE.
- SUBGRADE SHALL BE FIRM AND UNYIELDING AND THE GRANULAR BASE ROCK SHALL BE COMPACTED TO 95% PER AASHTO T-180.
- CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES OF DIRECTION, POINTS OF CURVATURE AND AT 15' (MAX) INTERVALS. JOINTS SHALL BE 1/8" TO 1/4" WIDE AND A MINIMUM DEPTH OF 1/3 THE THICKNESS OF THE CONCRETE.
- ALL SURFACES SHALL BE TROWELED AND BROOMED PER INDUSTRY STANDARDS. SEE THE STANDARD CONSTRUCTION SPECIFICATIONS.
- WHERE LIGHTING IS NEEDED AND/OR REQUIRED, LIGHTING SHALL MEET IES STANDARDS FOR PEDESTRIAN SCALE LIGHTING. STYLE AND HEIGHT MAY VARY (UP TO 12' HEIGHT).
- WHERE ACCESS WAYS CONTINUE ACROSS STREETS, ADA ACCESSIBLE RAMPS WILL BE REQUIRED.



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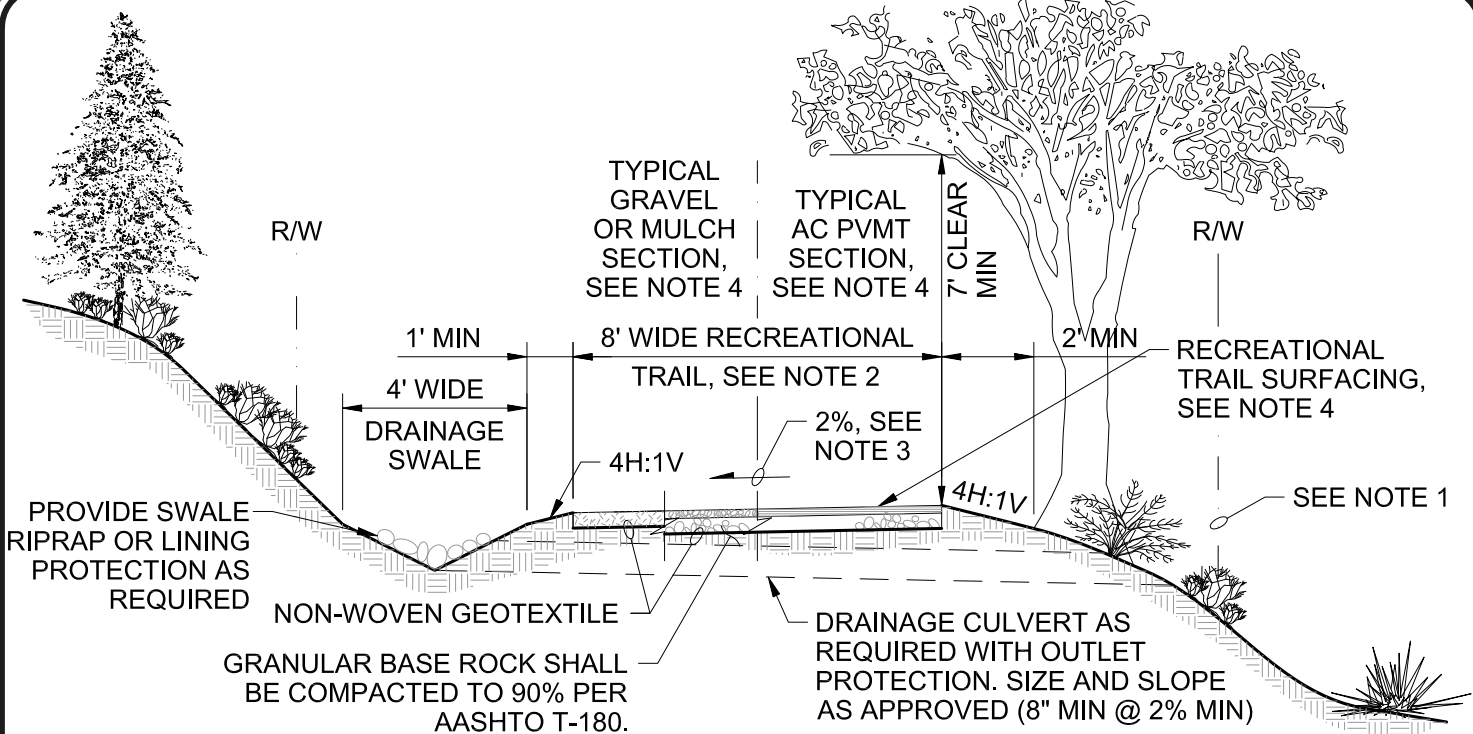
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**PEDESTRIAN/BICYCLE
MULTI-USE PATH
ACCESS WAY**

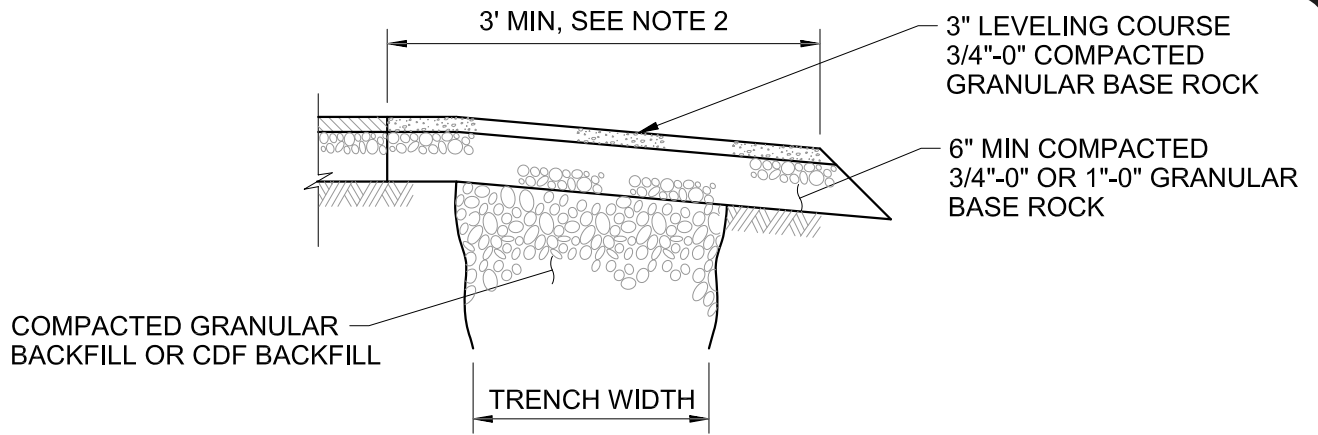
NO SCALE
DIVISION
STREET
DRAWING NO.
312



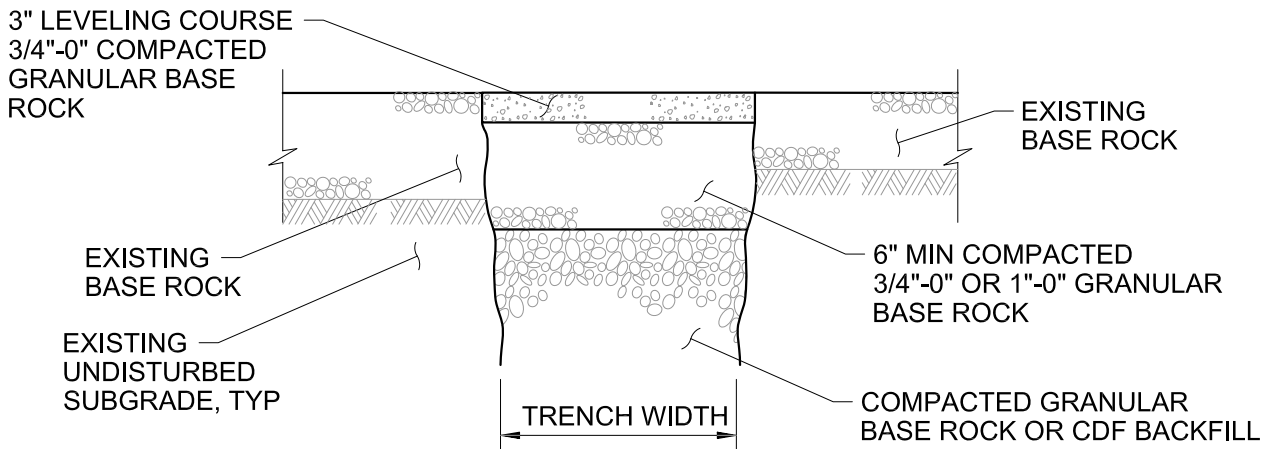
NOTES:

1. TRAIL RIGHT-OF-WAY OR EASEMENT WIDTH SHALL BE A MINIMUM OF 20 FEET OR AS REQUIRED BY THE CITY ENGINEER. TRAIL SHALL BE LOCATED A MINIMUM OF 20 FEET FROM THE TOP OF BANKS OF RIVERS, STREAMS, OR OTHER WATERWAYS TO PROTECT NATURAL RIPARIAN VEGETATION AND OTHER SENSITIVE AREAS. WHERE REQUIRED, TRAIL SHALL BE INTERRUPTED BY PERIODIC POINTS OF ACCESS TO PERMIT VIEWING OF THE WATERWAY FROM THE BANK.
2. TRAIL SHALL BE 8' WIDE AND SHALL BE FOR PEDESTRIAN USE ONLY. TRAIL WIDTH MAY BE REDUCED TO 4' WIDE MINIMUM IN AREAS OF STEEP OR DIFFICULT TERRAIN WHERE SPECIFICALLY APPROVED BY THE CITY ENGINEER. TRAIL SHALL HAVE 2' WIDE NATIVE SHOULDERS ON FILL SLOPES AND 1' WIDE NATIVE SHOULDERS WITH 4' WIDE DRAINAGE SWALES ON CUT SLOPES AS SHOWN.
3. TRAIL CROSS SLOPE SHALL BE 2%. IN AREAS OF STEEP OR DIFFICULT TERRAIN, A 5% CROSS SLOPE MAY BE ALLOWED WHERE APPROVED BY THE CITY ENGINEER. TRAILS THAT EXCEED AN 18 PERCENT LONGITUDINAL GRADE SHALL BE CONSTRUCTED WITH STAIRS AND HANDRAILS. STAIR DIMENSIONS SHALL BE THE TRAIL WIDTH BY 5 FEET LONG MINIMUM. THE USE OF SWITCHBACKS OR OTHER ALTERNATIVES TO STAIRS MAY BE USED WHERE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
4. TRAIL SHALL BE CONSTRUCTED OF 2-INCHES OF 1/2 INCH DENSE ASPHALT CONCRETE PAVEMENT OVER 4-INCHES OF COMPACTED 3/4"-0" GRANULAR BASE ROCK, UNLESS OTHERWISE APPROVED. TRAILS REQUIRED TO BLEND WITH THE SIDEWALK SYSTEM IN PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE TO SIDEWALK STANDARDS. TRAILS REQUIRED TO BLEND WITHIN A NATURAL RURAL SETTING, AS DETERMINED BY THE CITY ENGINEER, SHALL BE CONSTRUCTED OF 2-INCHES OF COMPACTED 1/4"-0" CRUSHED AGGREGATE OVER 4-INCHES OF COMPACTED 3/4"-0" GRANULAR BASE ROCK OR, IF DIRECTED, SHALL BE CONSTRUCTED OF 4-INCHES MINIMUM OF A CITY ENGINEER APPROVED BARK MULCH OR AN APPROVED UNPROCESSED MIX OF BARK AND WOOD FIBER (HOG FUEL). PAVEMENT OR OTHER APPROVED HARD SURFACING WILL BE REQUIRED IN LOCATIONS NEAR WETLANDS OR OTHER MARSHY AREAS.
5. EXISTING VEGETATION AND/OR OTHER OBSTRUCTIONS SHALL BE REMOVED COMPLETELY IN AREAS RECEIVING A HARD SURFACING, INCLUDING ALL STUMPS AND ROOTS. OTHER EXISTING VEGETATION SHALL BE REMOVED ONLY AS NECESSARY TO PERMIT THE INSTALLATION OF THE NEW TRAIL SYSTEM. AREAS BEYOND THE TRAIL CONSTRUCTION LIMITS SHALL NOT BE DISTURBED. ALL UNSUITABLE MATERIALS SHALL BE DISPOSED OF IN A MANNER AND LOCATION APPROVED BY THE CITY ENGINEER. ALL DISTURBED SURFACES NOT RECEIVING A HARD SURFACING SHALL BE SEEDED WITH AN APPROVED NON-INVASIVE NATIVE GRASS VARIETY.

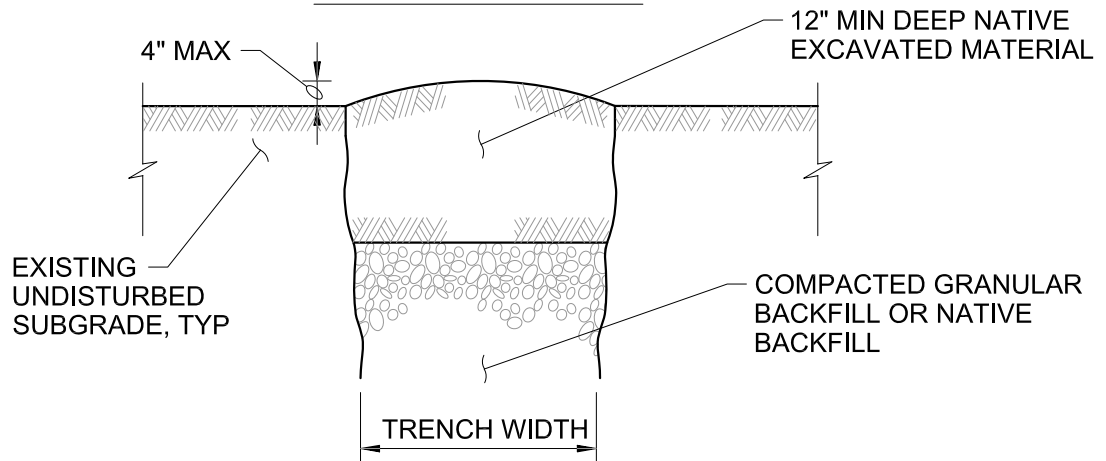
 <p>DEPARTMENT OF PUBLIC WORKS 362 N. THIRD AVENUE STAYTON, OR 97383 PH: (503) 769-2919 FAX: (503) 767-2134</p>	2021 EDITION	STANDARD DRAWING TITLE	NO SCALE
	REVIEWED BY	RECREATIONAL TRAIL	DIVISION
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	NAME DATE	REVISIONS	DRAWING NO.
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GRAVEL SURFACING FOR SHOULDER



GRAVEL SURFACING



NATIVE SURFACING

NOTES:

1. SEE THE STANDARD CONSTRUCTION SPECIFICATIONS FOR COMPACTION REQUIREMENTS.
2. SHOULDER SHALL BE RESTORED TO 3' MINIMUM WHERE ANY PORTION OF THE TRENCH EXCAVATION IS WITHIN THE SHOULDER AREA.
3. SEE STANDARD DRAWING NUMBER 206 FOR TRENCH WIDTH.



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**GRAVEL AND NATIVE
SURFACE
RESTORATION**

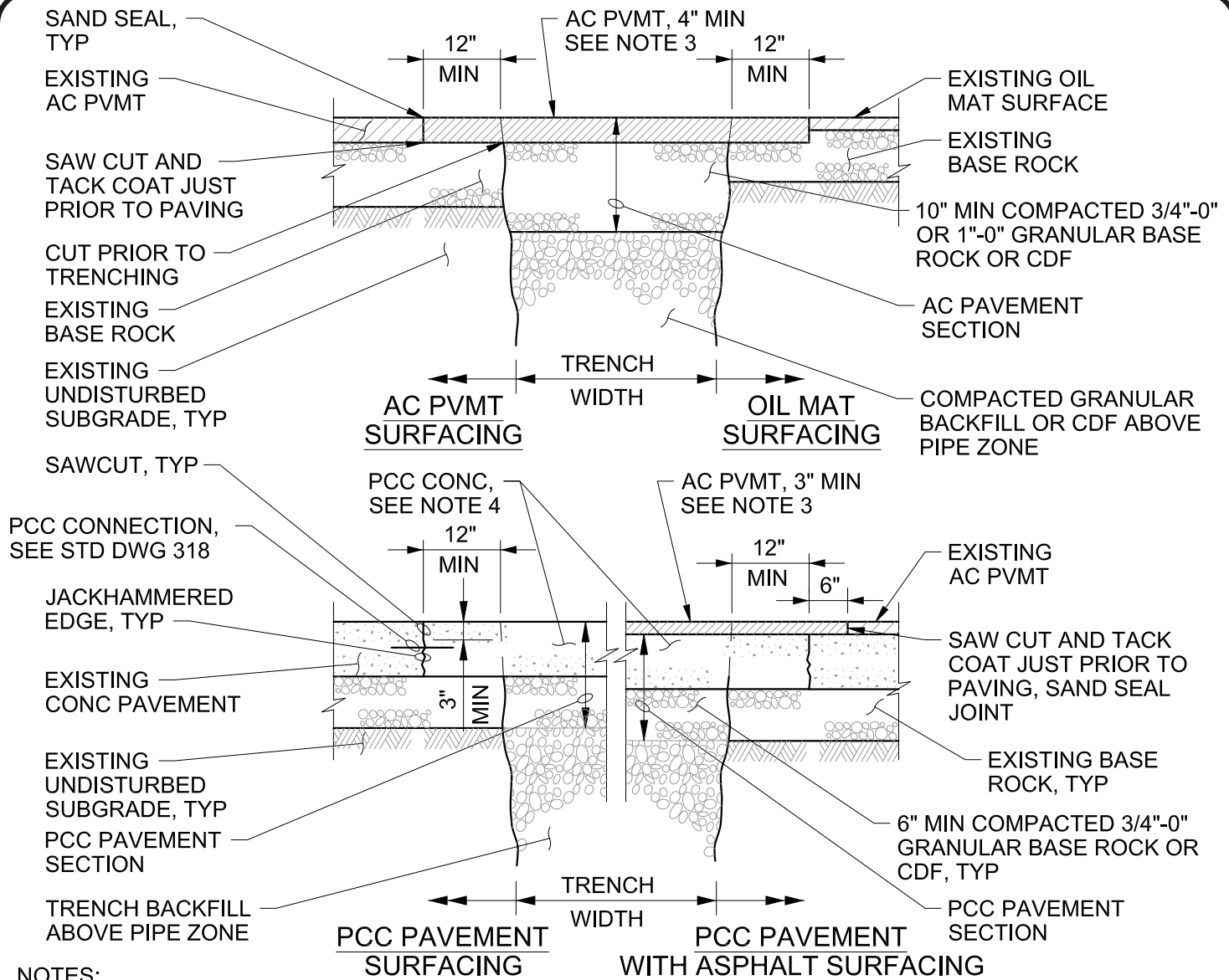
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NOTES:

1. IF LOCATION OF TRENCH SAWCUT IS WITHIN 3' OF AN EXISTING JOINT OR EDGE, REPLACE THE ENTIRE ASPHALT OR PORTLAND CEMENT CONCRETE PAVEMENT SECTION TO THE EXISTING JOINT OR EDGE.
2. ALL EXISTING AC AND PCC PAVEMENT SHALL BE SAWCUT JUST PRIOR TO PAVING. ALL CUT EDGES SHALL BE FREE OF LOOSE MATERIAL. SEE STANDARD DRAWING 304 FOR TYPICAL AC PVMT SECTION.
3. AC PAVEMENT SHALL BE PER STANDARD DRAWING 304 COMPACTED IN TWO EQUAL LIFTS TO 91% PER AASHTO T-209. PAVEMENT THICKNESS SHALL MATCH EXISTING OR 4" MIN, WHICHEVER IS GREATER. ALL EDGES SHALL BE TACK COATED PRIOR TO PAVING AND SAND SEALED AFTER COMPLETION.
4. PCC PAVEMENT SHALL BE 5,000 PSI AND SHALL MATCH EXISTING THICKNESS OR 7" MIN FOR LOCAL STREETS, 8" MIN FOR COLLECTOR STREETS, OR 9" MIN FOR ARTERIAL STREETS, WHICHEVER IS GREATER. CONSTRUCT JOINTS ACROSS NEW CONCRETE TO MATCH EXISTING JOINT TYPES AND LOCATIONS. SEE STANDARD DRAWING 304 FOR TYPICAL PCC PAVEMENT SECTION.
5. GRANULAR BASE ROCK SHALL BE 1"-0" COMPACTED TO A MIN 95% PER AASHTO T-180. THICKNESS SHALL MATCH EXISTING OR BE MINIMUM SHOWN, WHICHEVER IS GREATER.
6. A FULL WIDTH STREET OVERLAY OR GRIND/INLAY MAY BE REQUIRED DEPENDING UPON THE EXTENT OF NEW AND EXISTING PAVEMENT CUTS.



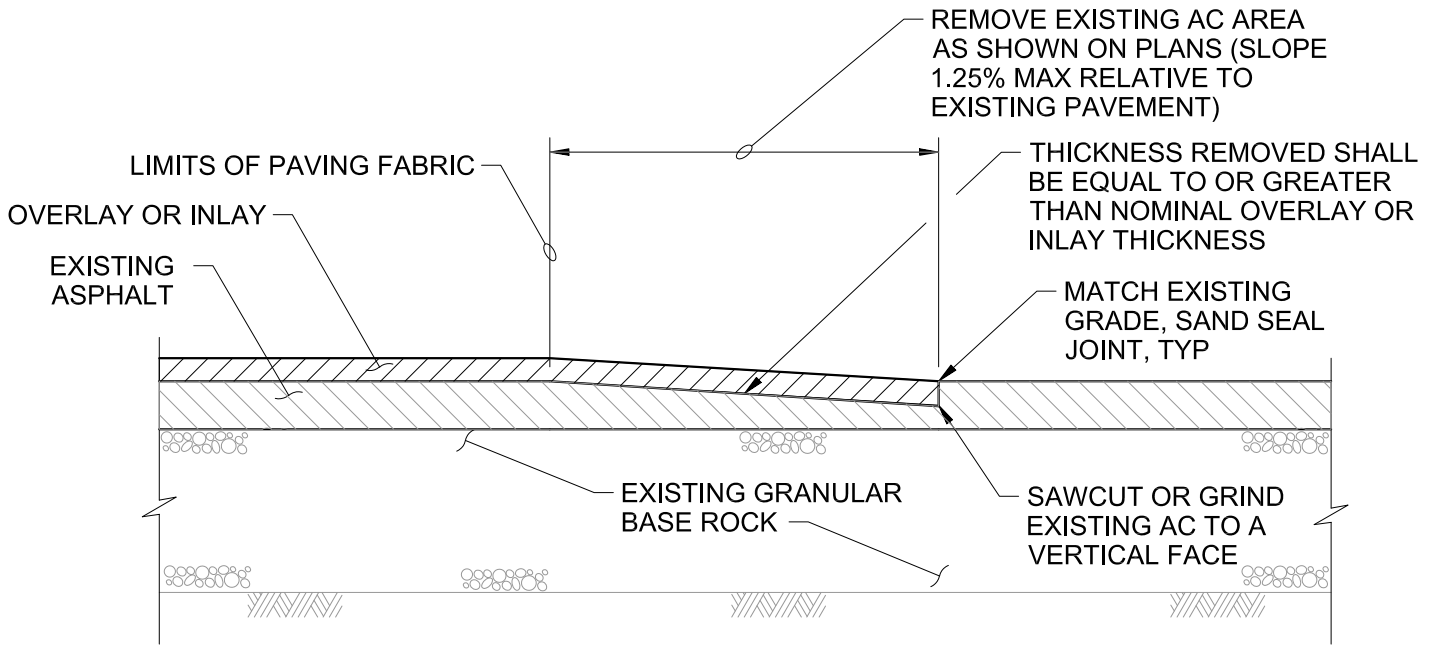
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PAVEMENT SURFACE RESTORATION

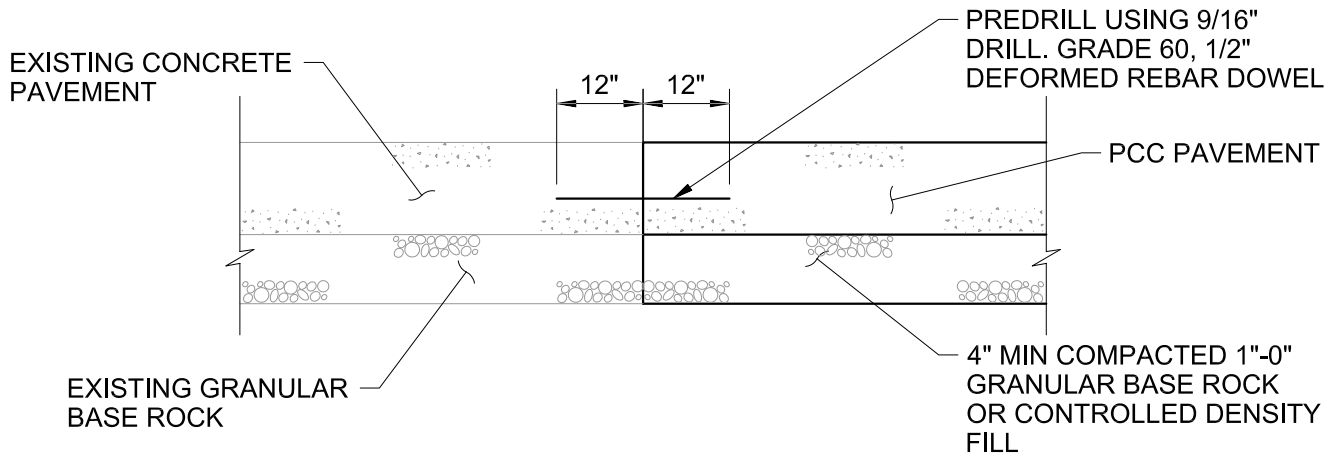
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318



NOTES:

1. ASPHALT CONCRETE PAVEMENT SURFACES SHALL BE PROPERLY PREPARED AND TACK COATED PRIOR TO PLACEMENT OF ASPHALT OVERLAY OR GRIND INLAY.
2. ASPHALT CONCRETE PAVEMENT SHALL BE COMPACTED TO 91% PER AASHTO T-209.


AC PAVEMENT NOTCHING DETAIL



NOTES:

1. EXISTING PORTLAND CEMENT CONCRETE PAVEMENT SHALL BE DRILLED USING APPROPRIATE MASONRY DRILL BIT.
2. DOWELS SHALL BE PLACED ALONG THE CENTERLINE OF THE PCC PAVEMENT AT 2' ON CENTER.

PCC PAVEMENT CONNECTION



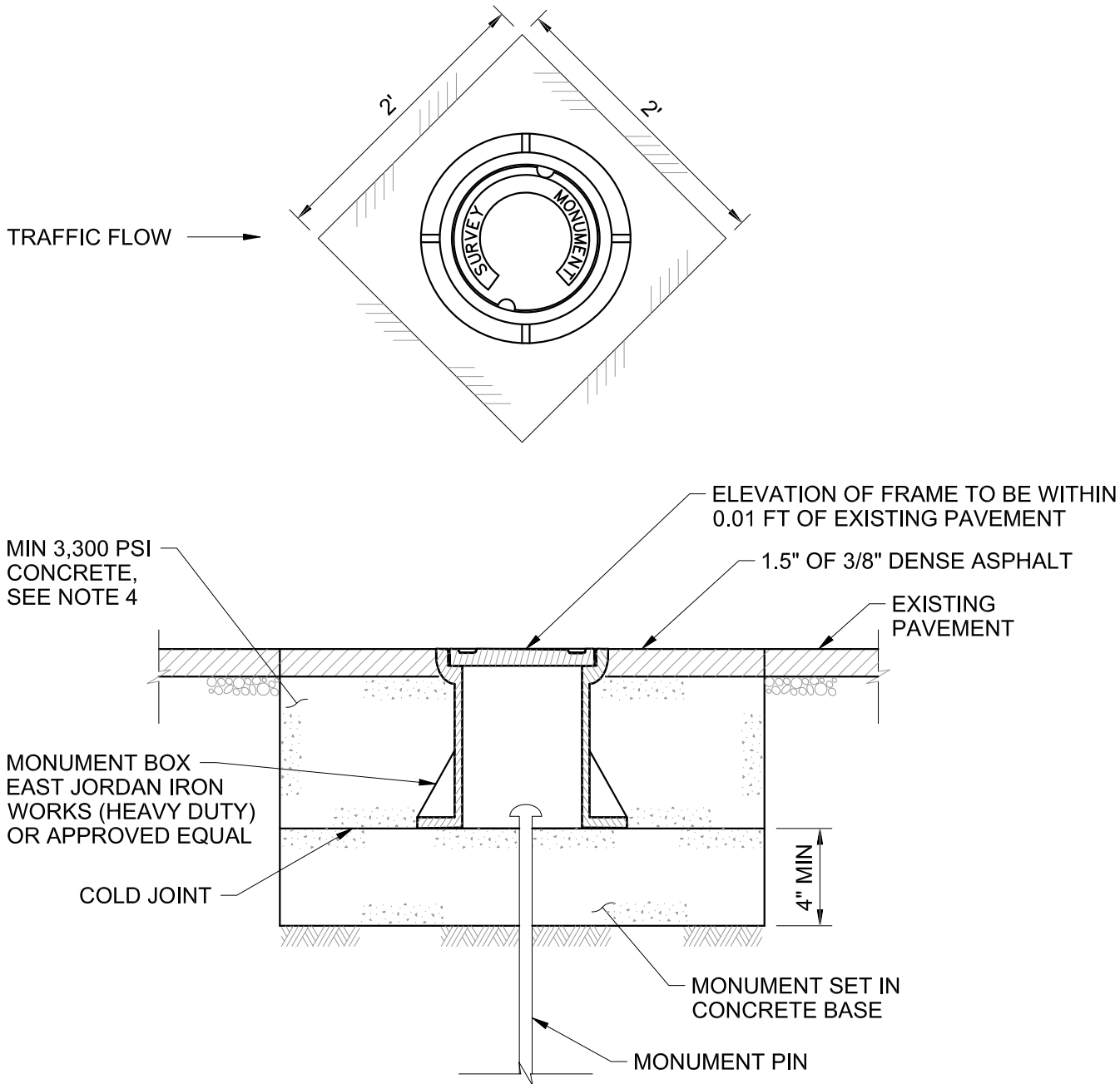
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PAVEMENT CONNECTION DETAILS

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NOTES:

1. A COLD JOINT SHALL BE CONSTRUCTED BETWEEN THE MONUMENT PIN BASE AND THE CONCRETE THAT IS PLACED DURING SURFACE RESTORATION.
2. THE MONUMENT BOX SHALL NOT BE CAST INTO THE MONUMENT PIN BASE.
3. FINISH ELEVATION OF SURVEY MONUMENT BOXES SHALL BE WITHIN 0.01 FOOT OF THE ADJACENT STREET FINISH GRADE. IF THE DIFFERENCE IN ELEVATION EXCEEDS 0.01 FOOT, THE MONUMENT BOX ASSEMBLY SHALL BE ADJUSTED AS SPECIFIED IN NOTE 4.
4. FOR SURVEY MONUMENT INSTALLATION IN EXISTING STREETS NOT SCHEDULED FOR NEW SURFACING, A 2' x 2' SQUARE OF ASPHALT SHALL BE REMOVED AND THE ENTIRE AREA EXCAVATED TO A DEPTH OF APPROXIMATELY 9.5" BELOW FINISH GRADE OF THE STREET. CONCRETE SHALL BE PLACED TO A DEPTH OF APPROXIMATELY 8" WITHIN THE ENTIRE CUT OUT AREA IN TWO SEPARATE POURS AS SHOWN. THE CONCRETE SHALL BE COVERED WITH 3/8" DENSE ASPHALT WITH A MINIMUM DEPTH OF 1.5".



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**SURVEY
MONUMENT BOX**

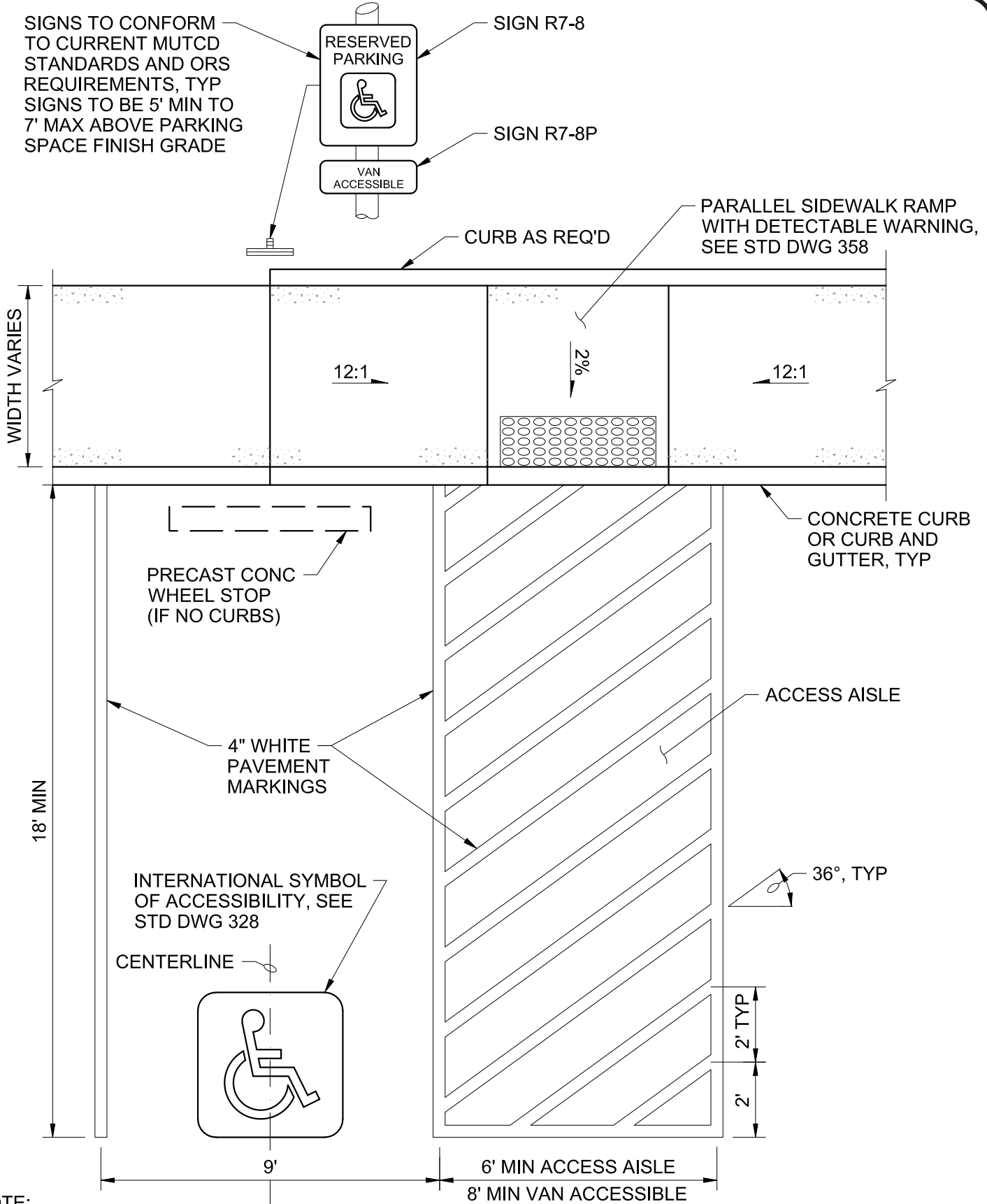
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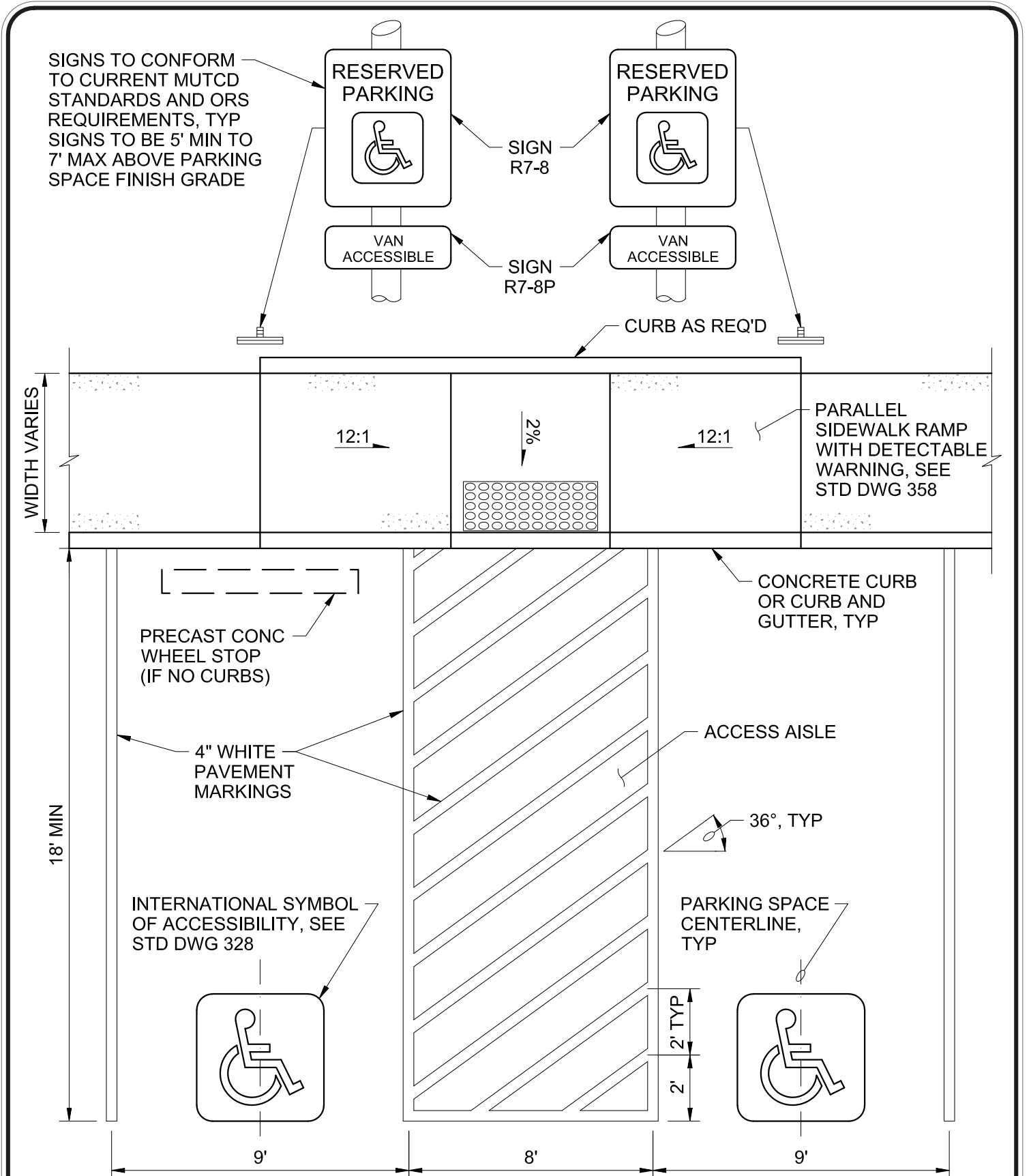
322



NOTE:


1. MAXIMUM 2% SLOPE WITHIN ACCESSIBLE PARKING SPACE OR ACCESS AISLE.

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NOTE:

1. MAXIMUM 2% SLOPE WITHIN ACCESSIBLE PARKING SPACES OR ACCESS AISLE.



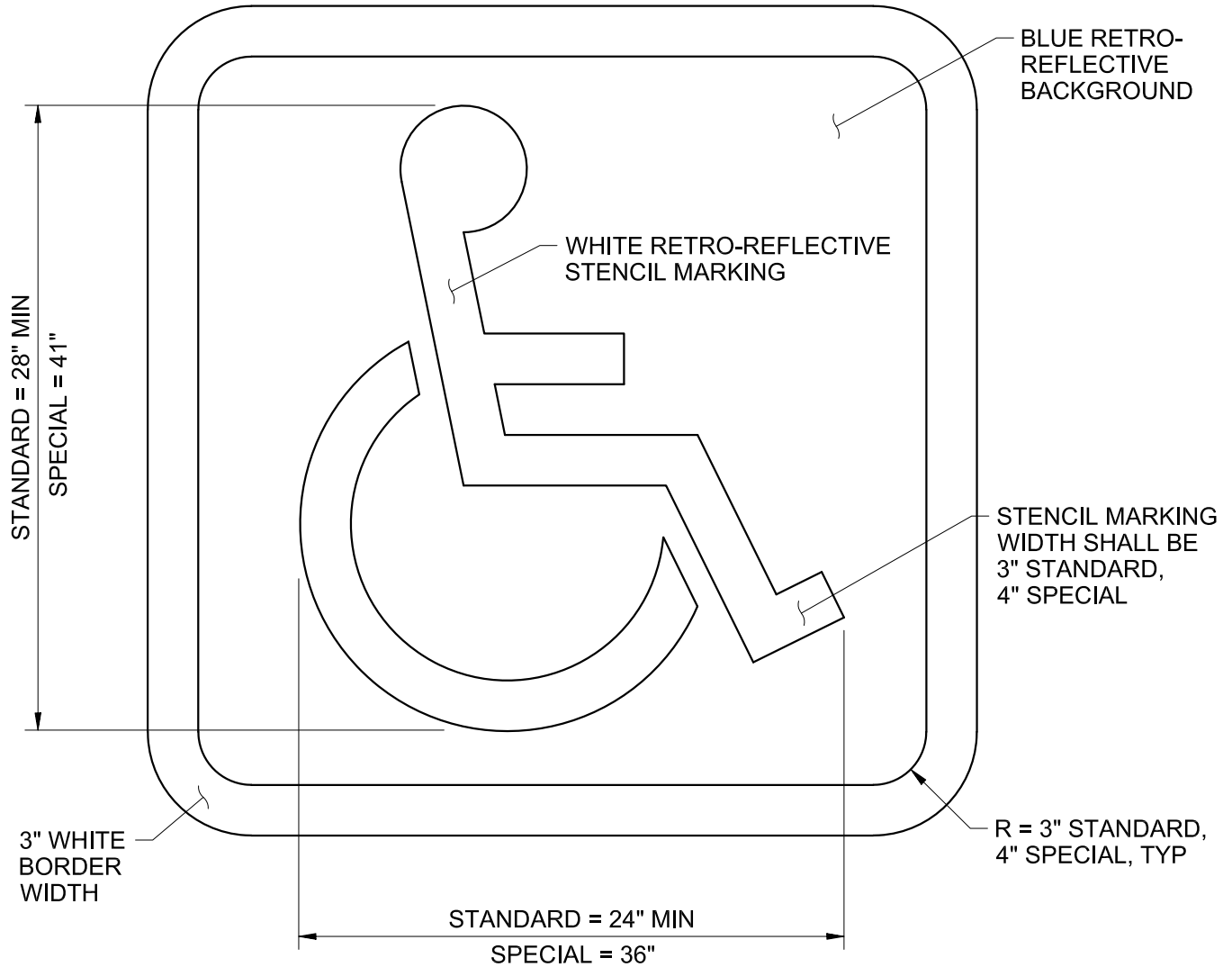
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DOUBLE ACCESSIBLE PARKING SPACE

NO SCALE
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326



NOTES:

1. PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH MUTCD 3B-19 AND SHALL BE USED TO DESIGNATE ANY ACCESSIBLE PARKING AREA RESERVED FOR VEHICLES WITH DEPARTMENT OF MOTOR VEHICLE PERMITS. THE STANDARD SYMBOL PAVEMENT MARKING SIZE AND WIDTHS SHALL BE USED, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
2. PAVEMENT MARKING BACKGROUND SHALL BE BLUE RETRO-REFLECTIVE. INTERIOR STENCIL AND EXTERIOR BORDER SHALL BE WHITE RETRO-REFLECTIVE, 3-INCH WIDE FOR STANDARD SYMBOLS AND 4-INCH WIDE FOR SPECIAL SYMBOLS.



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**INTERNATIONAL
SYMBOL OF
ACCESSIBILITY**

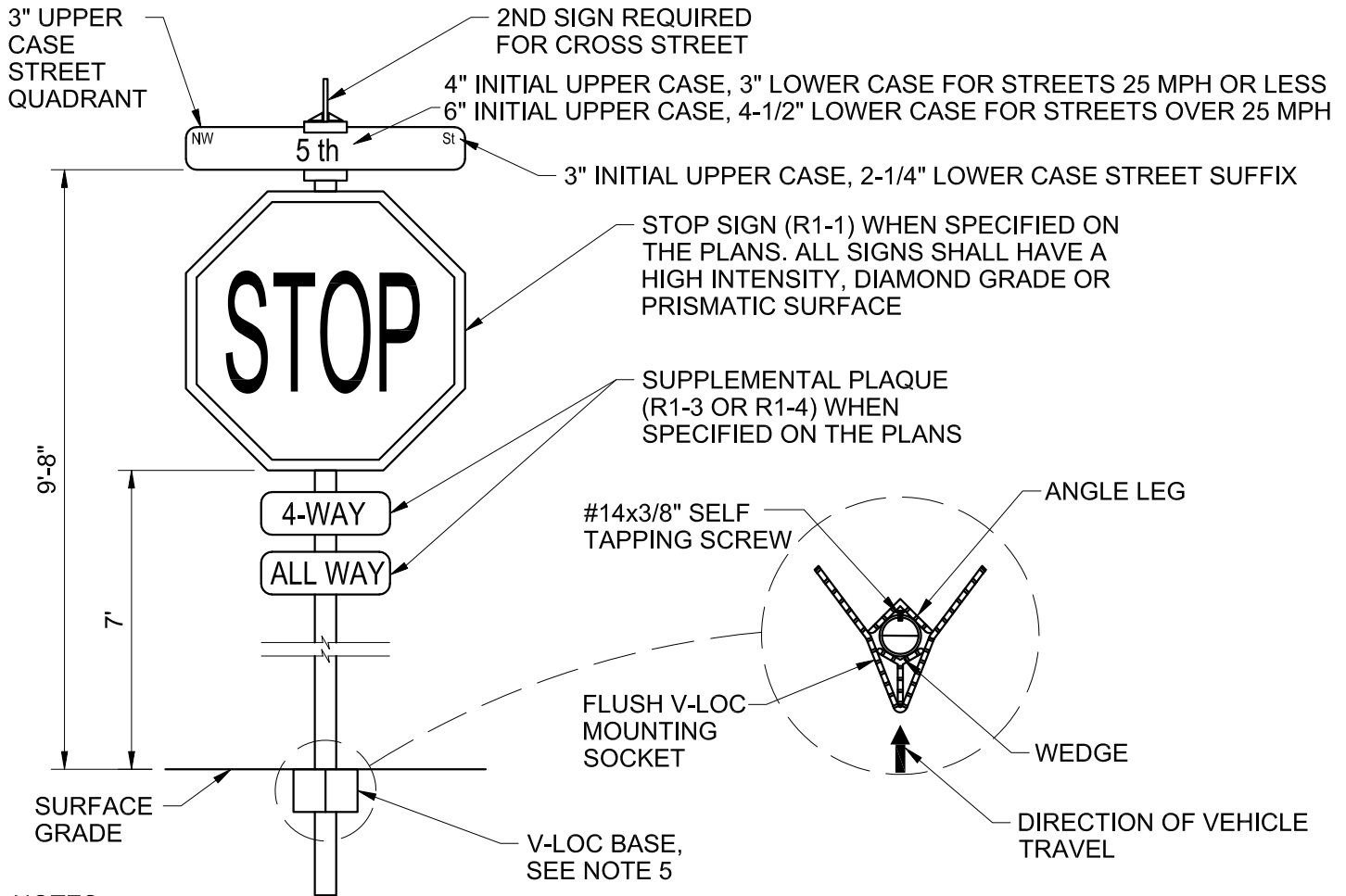
NO SCALE

DIVISION

STREET


DRAWING NO.

328



NOTES:

1. ALL SIGNS SHALL CONFORM TO THE CURRENT VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE CURRENT OREGON SUPPLEMENT TO THE MUTCD.
2. STREET NAME SIGNS SHALL BE 6"x30", 6"x36", OR 9"x42" (FOR SIGNS WITH 6" LETTERS) EXTRUDED ALUMINUM, DOUBLE-FACED WITH ENGINEERS GRADE WHITE ON GREEN REFLECTIVE SHEETING. PROVIDE EACH POLE WITH A SECOND SIGN FOR A CROSSING STREET.
3. STOP SIGNS SHALL BE 0.080-INCH THICK ANODIZED ALUMINUM. UNLESS SPECIFIED OTHERWISE, REGULATORY AND WARNING SIGNS SHALL BE A MINIMUM SIZE OF 30-INCHES.
4. SIGNS SHALL BE MOUNTED ON THE POST WITH HAWKINS, SINGLE CLAMP ON U-BRACKETS, WITH HEX HEAD SCREWS. GALVANIZED PRESS-ON PIPE CAPS SHALL BE INSTALLED ON THE TOP OF THE SIGN POST WHEN NO STREET SIGNS ARE PRESENT.
5. POLE BASE SHALL BE V-LOC ANCHOR SYSTEM MODEL 23-VR3 (SOIL APPLICATION) OR 23-VR1 (CONCRETE APPLICATION), OR APPROVED EQUAL. WHEN POLE IS PLACED IN CONCRETE, CONCRETE SHALL NOT COVER THE V-LOC WEDGE UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
6. POST SHALL BE 2 3/8" OUTSIDE DIAMETER GALVANIZED STEEL PIPE WITH 0.095" WALL THICKNESS.
7. ALL STREET SIGN LETTERS SHALL BE PER THE MUTCD SECTION 2D.43 AND TABLE 2D-2.
8. DISTANCE FROM THE FACE OF CURB TO THE EDGE OF THE STREET NAME SIGN SHALL BE 2' MIN.
9. FINAL SIGN LOCATIONS SHALL BE AS APPROVED BY THE CITY ENGINEER.



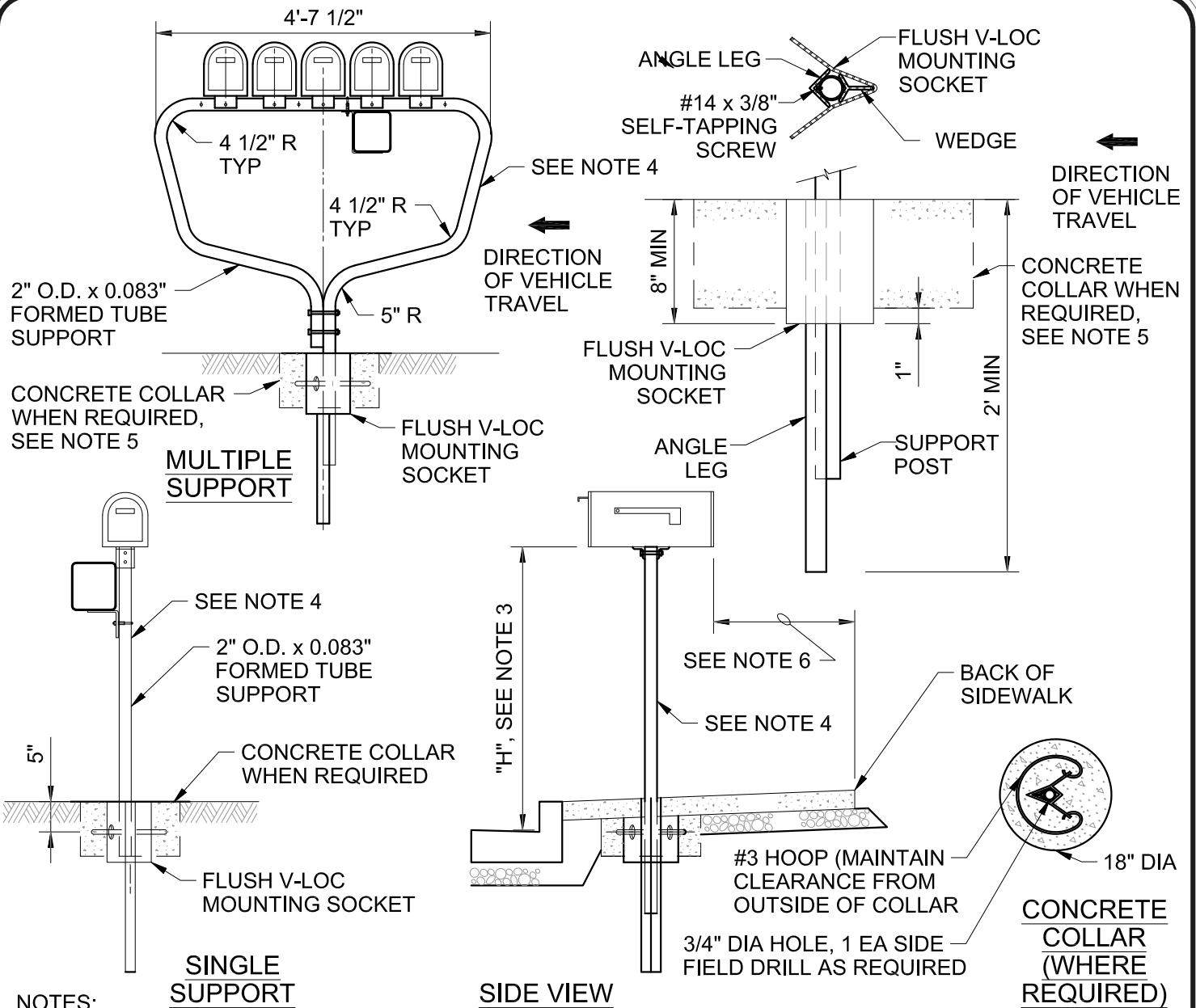
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STANDARD DRAWING TITLE

TYPICAL STREET NAME AND STOP SIGN


NO SCALE
DIVISION
STREET
DRAWING NO.
330



NOTES:

1. CONTACT THE USPS FOR REQUIREMENTS REGARDING LOCATIONS OF ALL MAILBOXES AND CLUSTER MAILBOXES. CLUSTER MAILBOX LOCATIONS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CHAPTER 11, SECTION 1111 OF THE OREGON STRUCTURAL SPECIALTY CODE (OSSC).
2. FACE OF MAILBOX SHALL BE 6" TO 12" FROM FACE OF CURB. ON STREETS WITHOUT CURBS, THE FRONT OF THE MAILBOX SHALL BE LOCATED AT THE OUTSIDE EDGE OF THE SHOULDER.
3. H = 50" MIN, 52" MAX FOR IMPROVED STREETS AND 36" MIN, 38" MAX FOR UNIMPROVED STREETS, UNLESS OTHERWISE DIRECTED BY THE USPS.
4. SUPPORTS SHALL BE MODEL 20-S (SINGLE), 20-D (DOUBLE) OR 20-M (MULTIPLE) MAILBOX SUPPORT KITS WITH V-LOC ANCHOR SYSTEM MODEL 23-VRS (SOIL APPLICATION) AND 23-VR1 (CONCRETE APPLICATION), AS MANUFACTURED BY TRAFFIC AND PARKING CONTROL COMPANY, INC OR APPROVED EQUAL.
5. CONCRETE SUPPORT COLLARS SHALL BE PROVIDED WHEN DIRECTED BY THE CITY ENGINEER.
6. SEE STANDARD DRAWING 342 FOR REQUIREMENTS RELATIVE TO CONSTRUCTION OF SIDEWALKS AROUND OBSTACLES.

DEPARTMENT OF PUBLIC WORKS



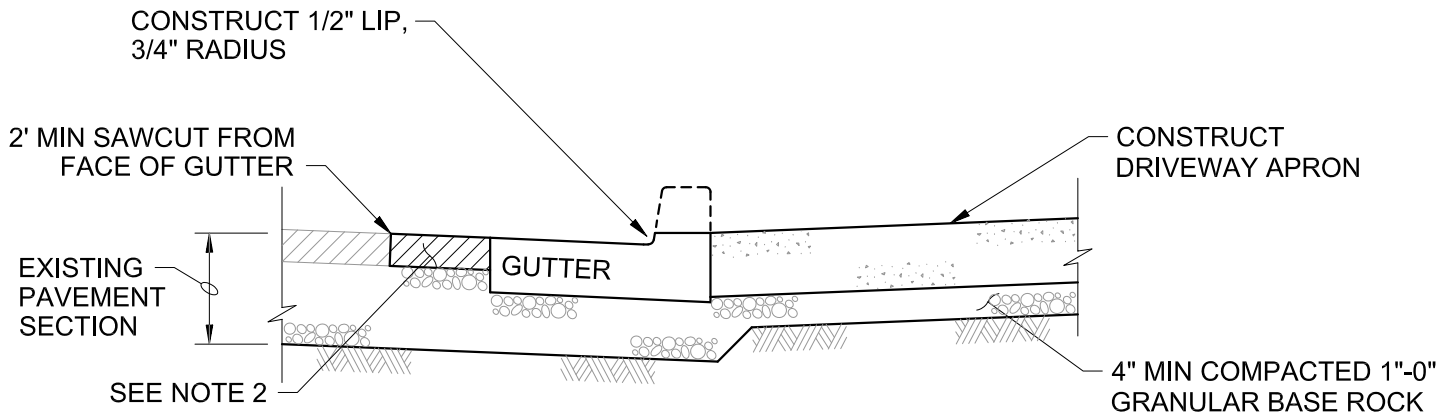
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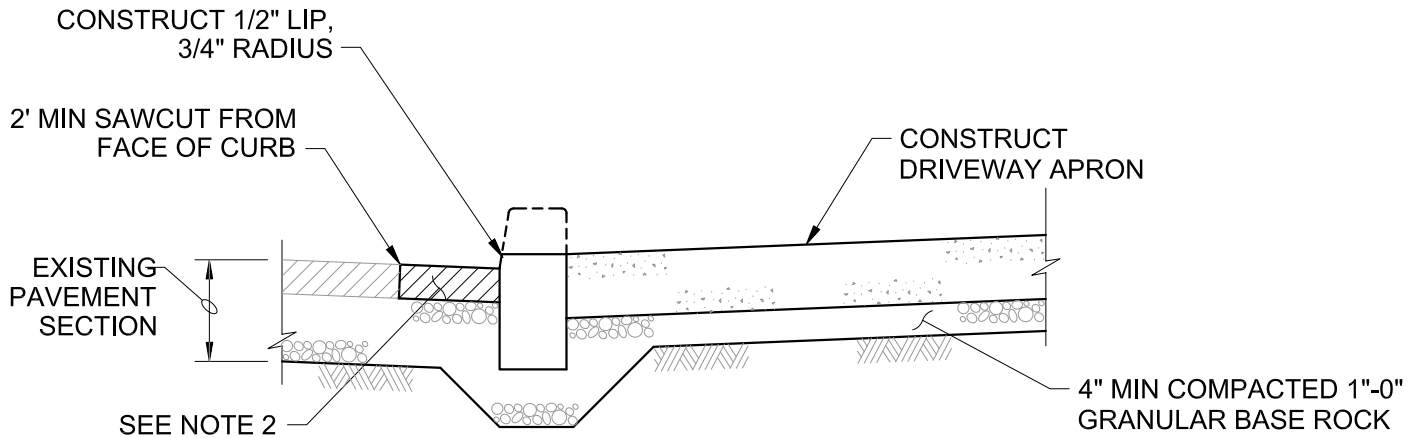
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MAILBOX LOCATION

NO SCALE
DIVISION
STREET
DRAWING NO.
332



CURB AND GUTTER



STRAIGHT CURB

NOTES:

1. ENTIRE CURB OR CURB AND GUTTER IS TO BE REMOVED AND REPLACED. THE EXISTING ASPHALT CONCRETE PAVEMENT SHALL BE SAWCUT BACK 2' FROM FACE OF CURB OR GUTTER AND REMOVED AND REPLACED WITH 4" MIN THICK 1/2" DENSE ASPHALT CONCRETE PAVEMENT. A 6" MONOLITHIC CONCRETE BENCH SHALL BE CONSTRUCTED WITH THE NEW GUTTER TO PROVIDE SUPPORT UNDER THE NEW PAVEMENT.
2. ALL CONCRETE JOINTS SHALL BE SEALED AFTER CONCRETE HAS CURED AND ALL ASPHALT JOINTS SHALL BE SAND SEALED AFTER ASPHALT HAS BEEN PLACED. SEE THE STANDARD CONSTRUCTION SPECIFICATIONS.



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STANDARD DRAWING TITLE

**CURB KNOCKOUT
FOR DRIVEWAYS**

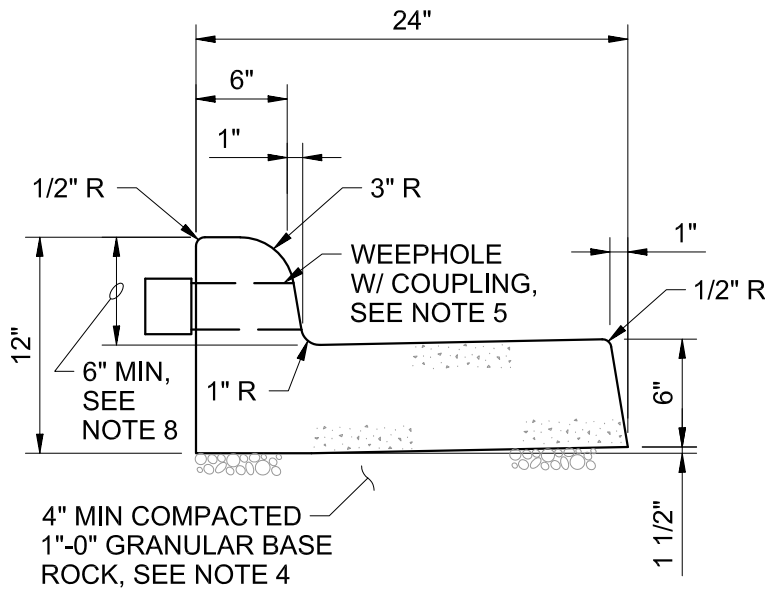
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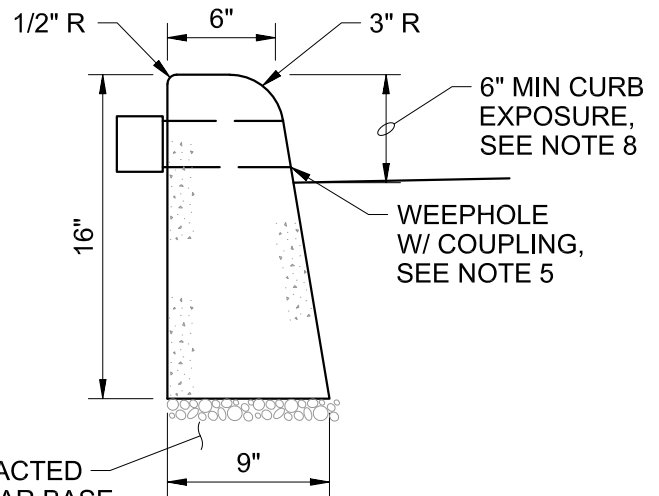
STREET

DRAWING NO.

334



CURB AND GUTTER



STRAIGHT CURB

NOTES:

1. CONCRETE TO HAVE COMPRESSIVE STRENGTH OF 3,300 PSI AT 28 DAYS.
2. CONTRACTION JOINTS SHALL BE PLACED AT A SPACING OF NOT MORE THAN 15 FEET WITH A DEPTH OF JOINT OF AT LEAST 1-1/2 INCHES.
3. EXPANSION JOINT MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2-INCH. EXPANSION JOINT TO BE PROVIDED AT EACH:
 - POINT OF TANGENCY.
 - COLD JOINT.
 - SIDE OF INLET STRUCTURES.
 - SIDE OF DRIVEWAYS.
4. GRANULAR BASE ROCK SHALL BE 1"-0" COMPACTED TO 95% PER AASHTO T-180. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4-INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12-INCHES BEHIND THE CURB.
5. DRAINAGE WEEPHOLE SHALL BE:
 - 3-INCH DIAMETER SCHEDULE 40 PVC.
 - CENTERED WITH CONTRACTION JOINTS.
 - CORE DRILLED THROUGH EXISTING CURBS FOR DRAINAGE ACCESS 1/2" MIN, 1" MAX ABOVE FLOW LINE.
6. CURBS AND GUTTERS SHOWN MAY BE USED WITH EITHER AC OR PCC PAVEMENTS.
7. TRANSITION FROM ONE CURB TYPE TO ANOTHER WILL BE DETAILED ON PLANS AS NECESSARY.
8. CURB EXPOSURE FOR ARTERIAL STREETS SHALL BE 7".



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STANDARD

PCC CURB AND GUTTER
AND STRAIGHT CURBS

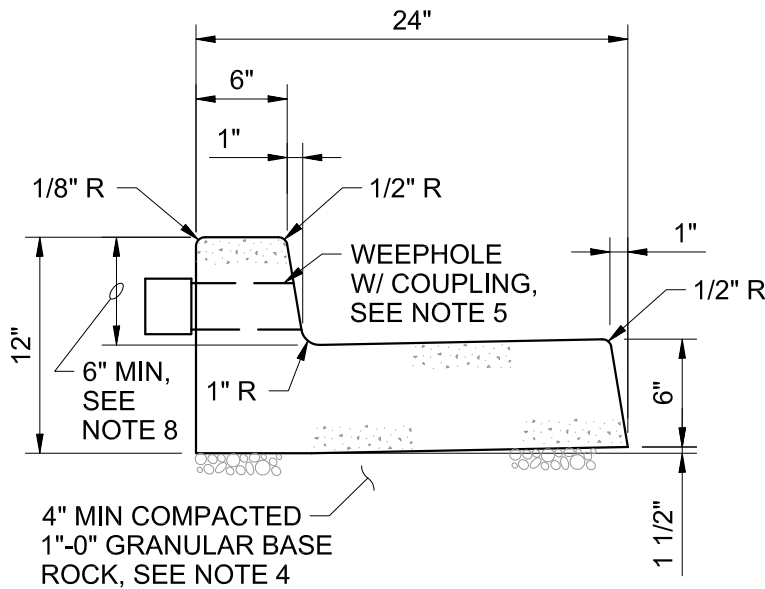
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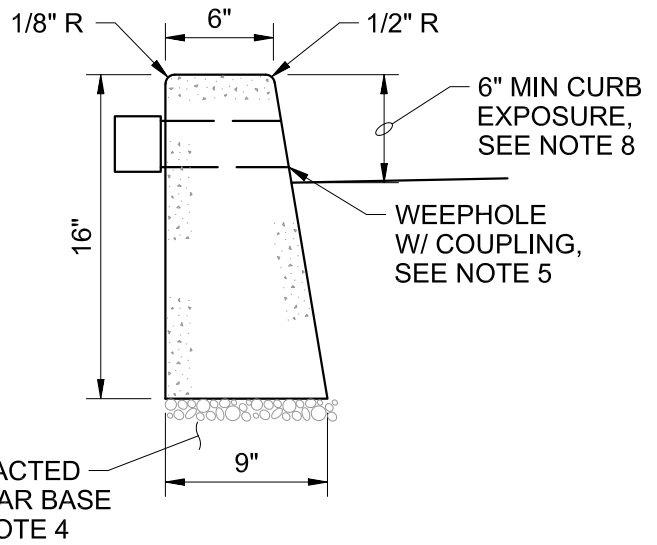
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DRAWING NO.

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CURB AND GUTTER



STRAIGHT CURB

NOTES:

1. CONCRETE TO HAVE COMPRESSIVE STRENGTH OF 3,300 PSI AT 28 DAYS.
2. CONTRACTION JOINTS SHALL BE PLACED AT A SPACING OF NOT MORE THAN 15 FEET WITH A DEPTH OF JOINT OF AT LEAST 1-1/2 INCHES.
3. EXPANSION JOINT MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2-INCH. EXPANSION JOINT TO BE PROVIDED AT EACH:
 - POINT OF TANGENCY.
 - COLD JOINT.
 - SIDE OF INLET STRUCTURES.
 - SIDE OF DRIVEWAYS.
4. GRANULAR BASE ROCK SHALL BE 1"-0" COMPACTED TO 95% PER AASHTO T-180. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4-INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12-INCHES BEHIND THE CURB.
5. DRAINAGE WEEPHOLE SHALL BE:
 - 3-INCH DIAMETER SCHEDULE 40 PVC.
 - CENTERED WITH CONTRACTION JOINTS.
 - CORE DRILLED THROUGH EXISTING CURBS FOR DRAINAGE ACCESS 1/2" MIN, 1" MAX ABOVE FLOW LINE.
6. CURBS AND GUTTERS SHOWN MAY BE USED WITH EITHER AC OR PCC PAVEMENTS.
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8. CURB EXPOSURE FOR ARTERIAL STREETS SHALL BE 7".



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**INFILL AND RETROFIT
PCC CURB AND GUTTER
AND STRAIGHT CURBS**

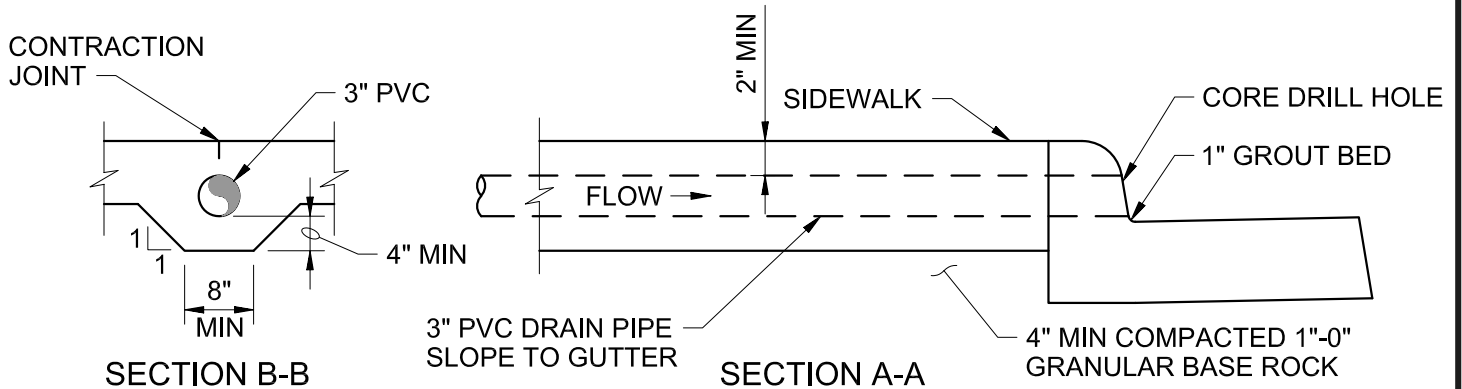
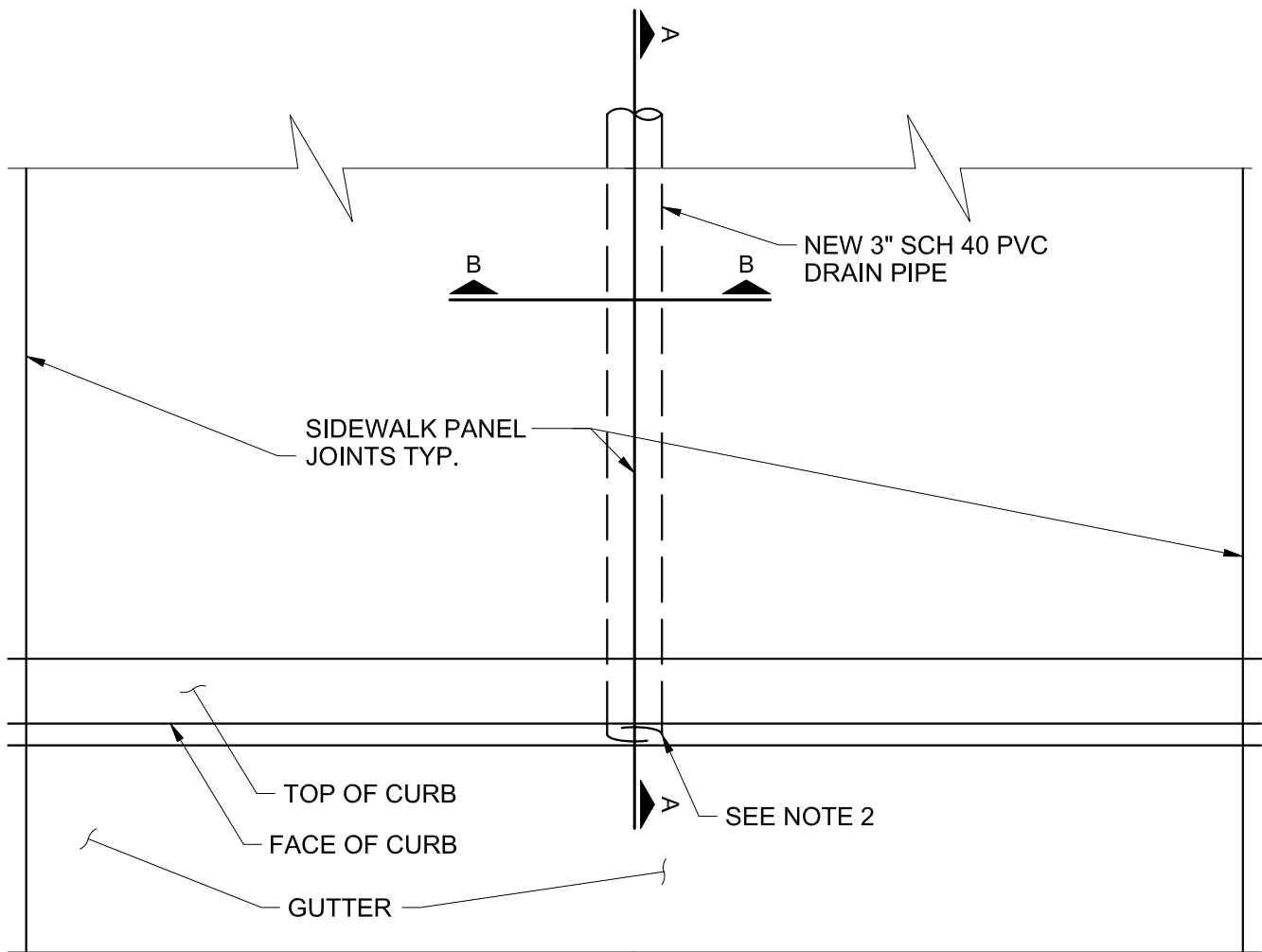
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DIVISION

STREET


DRAWING NO.

337



NOTES:

1. SAWCUT EXISTING SIDEWALK TO FULL DEPTH. MINIMUM LIMIT OF CONCRETE REMOVAL AND REPLACEMENT IS ENTIRE AREA BETWEEN PANEL DIVISION MARKS.
2. EXISTING CURB SHALL BE CORE DRILLED. NEW CURB SHALL BE PER STD DWG 336.
3. FINISH SIDEWALK AND CURB (TOP AND FACE) FLUSH WITH EXISTING ADJACENT LINE AND GRADE.
4. THE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF ALL CONCRETE SHALL BE 3,300 PSI.



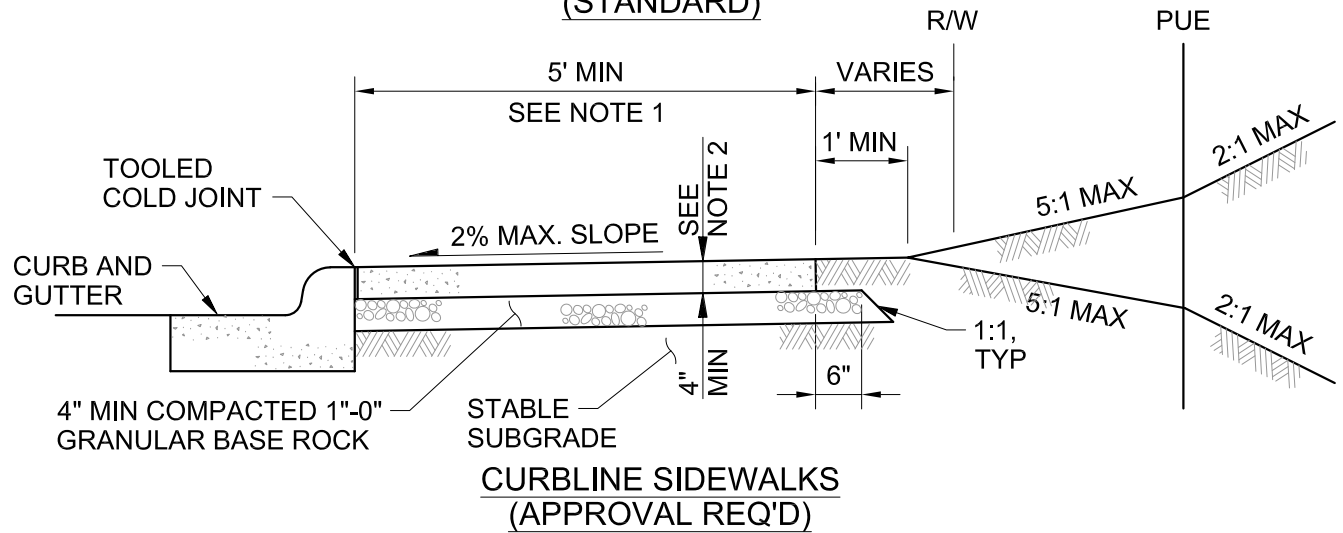
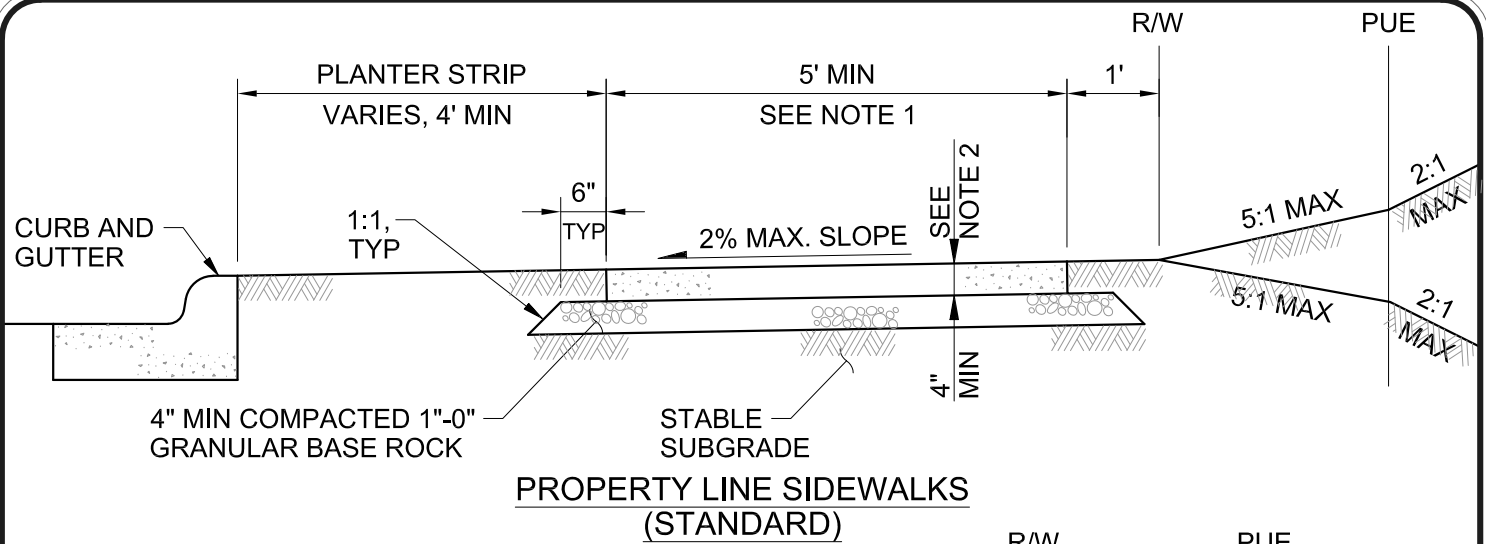
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STANDARD DRAWING TITLE

CURB DRAIN UNDER SIDEWALKS


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DIVISION
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STREET TYPE	PROPERTY LINE SIDEWALK WIDTH (STANDARD)	CURLINE SIDEWALK WIDTH (SEE NOTE 1)
LOCAL	5'-0"	6'-0" (SEE NOTE 1)
ATERIALS AND COLLECTORS	6'-0" TO 8'-0", AS REQUIRED	7'-0" (SEE NOTE 1)

NOTES:

- CURLINE SIDEWALKS ARE NOT PERMITTED WITHOUT CITY ENGINEER APPROVAL. WHERE CURLINE SIDEWALKS ABUT HANDICAP PARKING STALLS, INCREASE WIDTHS SHOWN BY 1'-0".
- CONCRETE THICKNESS FOR SIDEWALKS SHALL BE NOMINAL 4" MIN. THICKNESS IN DRIVEWAYS SHALL BE 6" MIN. COMMERCIAL DRIVEWAYS SHALL BE 8" MIN.
- CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH WITH 2" TO 4" SLUMP.
- PANELS TO BE 5' LONG, REGARDLESS OF PANEL WIDTH. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES IN DIRECTION, POINTS OF CURVATURE, AND AT 15' MAX INTERVALS.
- CURB DRAINS SHALL BE EXTENDED TO BACK OF SIDEWALK WITH 3" DIAMETER SCHEDULE 40 PVC PIPE SLOPED TO GUTTER. CONTRACTION JOINT SHALL BE PLACED OVER PIPE. SEE STD DWG 338.
- SIDEWALKS SHALL BE LOCATED ENTIRELY WITHIN RIGHT-OF-WAY OR SIDEWALK EASEMENTS, INCLUDING WIDENED SIDEWALKS AT DRIVEWAY APRONS.



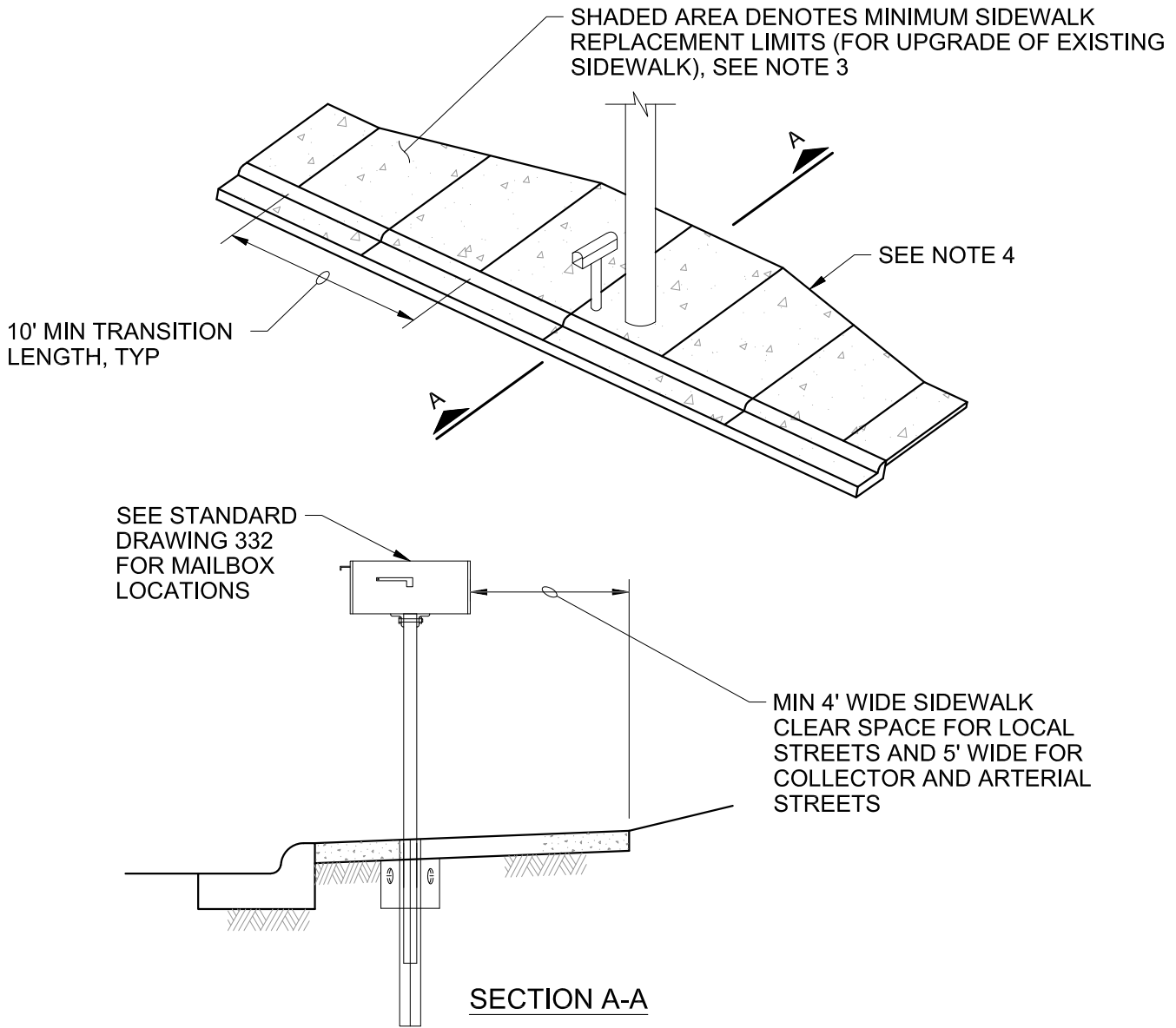
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PH: (503) 769-2919
FAX: (503) 767-2134

2021 EDITION	
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NAME	DATE
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STANDARD DRAWING TITLE


TYPICAL CONCRETE SIDEWALK

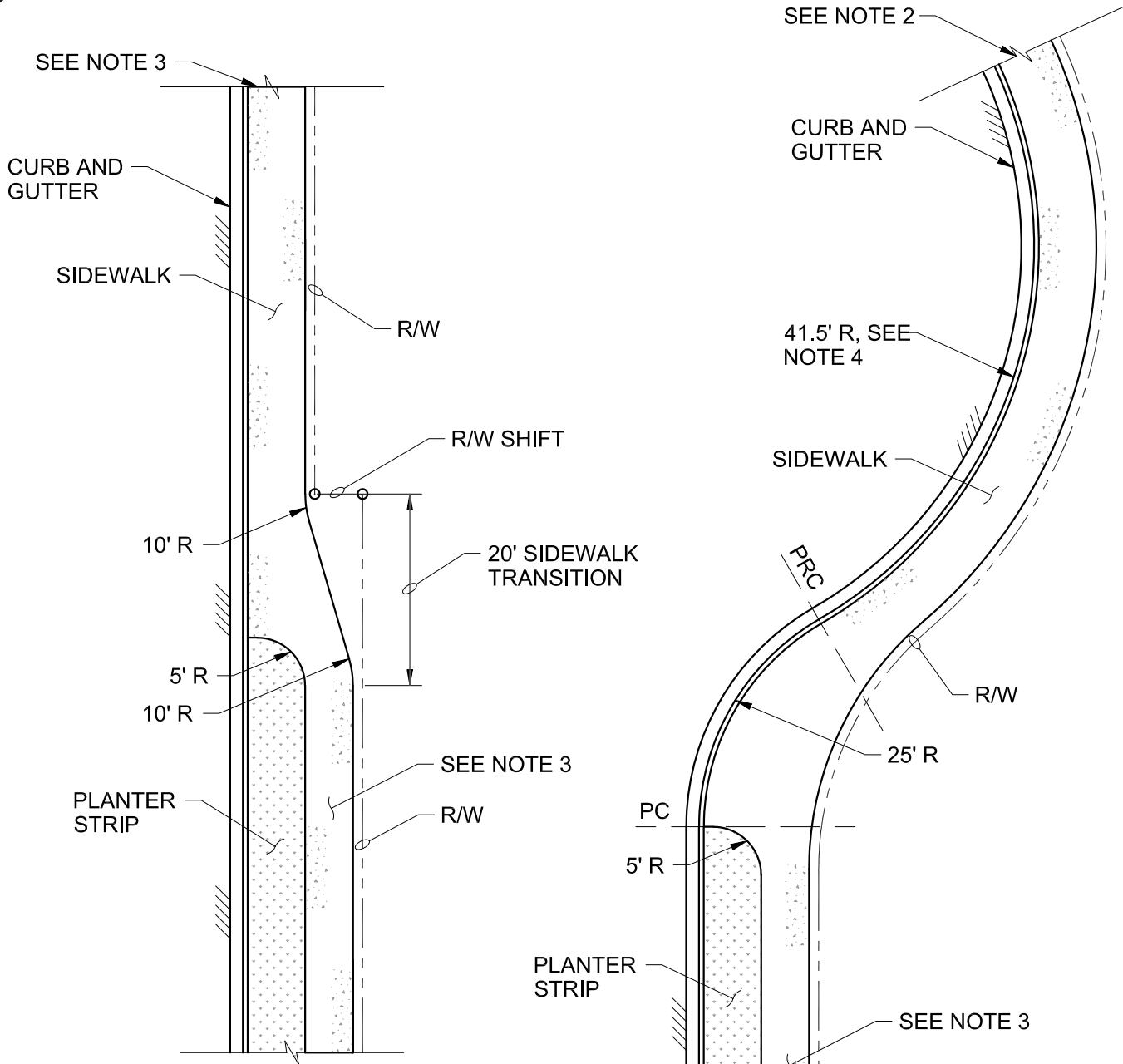
NO SCALE
DIVISION
STREET
DRAWING NO.
340



NOTES:

1. PROVIDE MINIMUM SIDEWALK CLEAR SPACE AROUND EXISTING OBSTRUCTIONS IN NEW AND EXISTING NON-STANDARD CURBLINE SIDEWALK. COMMON OBSTRUCTIONS INCLUDE FIRE HYDRANTS, MAIL BOXES, UTILITY POLES AND OTHER OBJECTS THE MAY IMPEDE PEDESTRIAN TRAFFIC.
2. SEE STANDARD DRAWING 340 FOR MINIMUM SIDEWALK WIDTHS. SIDEWALKS AROUND OBSTRUCTIONS SHALL COMPLY WITH THE MOST CURRENT ADA GUIDELINES.
3. CONSTRUCTION OF ADDITIONAL SIDEWALK AGAINST THE BACK OF EXISTING SIDEWALK TO MEET MINIMUM CLEAR SPACE REQUIREMENTS IS NOT PERMITTED.
4. ADDITIONAL PUBLIC R/W OR SIDEWALK EASEMENT MAY BE REQUIRED TO MEET MINIMUM SIDEWALK WIDTH REQUIREMENTS.
5. THE PERMIT ISSUED FOR A SPECIFIC SITE WILL DETERMINE CONFIGURATION OF SIDEWALK INVOLVING NON-STANDARD DIMENSIONS AND RIGHT-OF-WAY LIMITATIONS.

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	REVIEWED BY	TYPICAL	DIVISION
	JTA / LSL 09/21	SIDEWALK AROUND	STREET
	NAME DATE	OBSTRUCTIONS	DRAWING NO.
REVISIONS		342	




STRAIGHT TRANSITION

CUL-DE-SACS AND CURVE TRANSITION

NOTES:

1. CURBLINE SIDEWALK REQUIRES APPROVAL BY CITY ENGINEER. SEE PLANS FOR SPECIFIC PROJECTS WITH NON-TYPICAL TRANSITIONS FROM A STANDARD SIDEWALK WITH PLANTER STRIP TO CURBLINE SIDEWALK.
2. SIDEWALKS IN A CUL-DE-SAC ARE TO BE 6" THICK BEGINING AT THE PC. SEE STD DWG 308 AND 309.
3. FOR TYPICAL SIDEWALKS, SEE STANDARD DRAWING 340.
4. CURB RADIUS SHOWN IS FOR TYPICAL CUL-DE-SAC. OTHER CURVES AS APPROVED BY CITY ENGINEER.

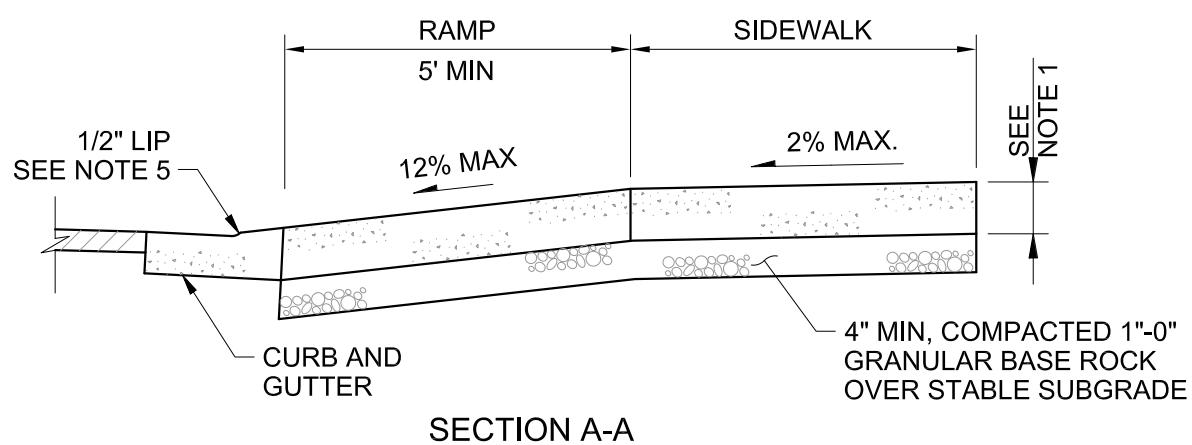
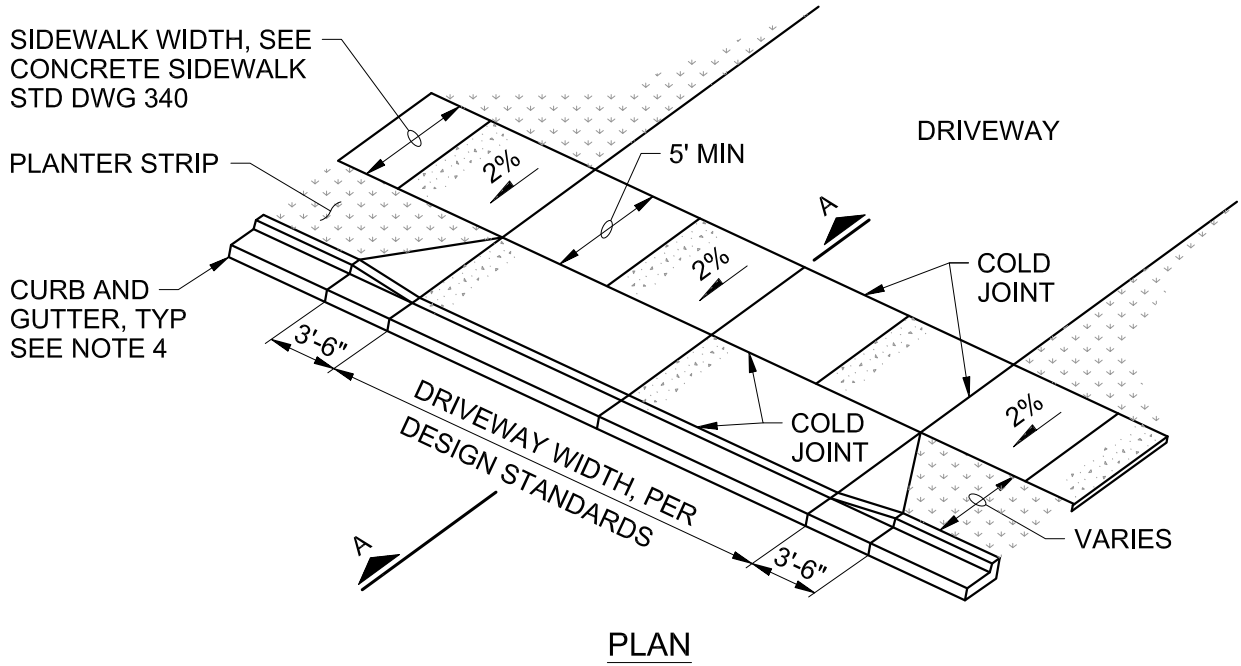


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STANDARD DRAWING TITLE
TYPICAL PROPERTY LINE SIDEWALK TO CURBLINE TRANSITION

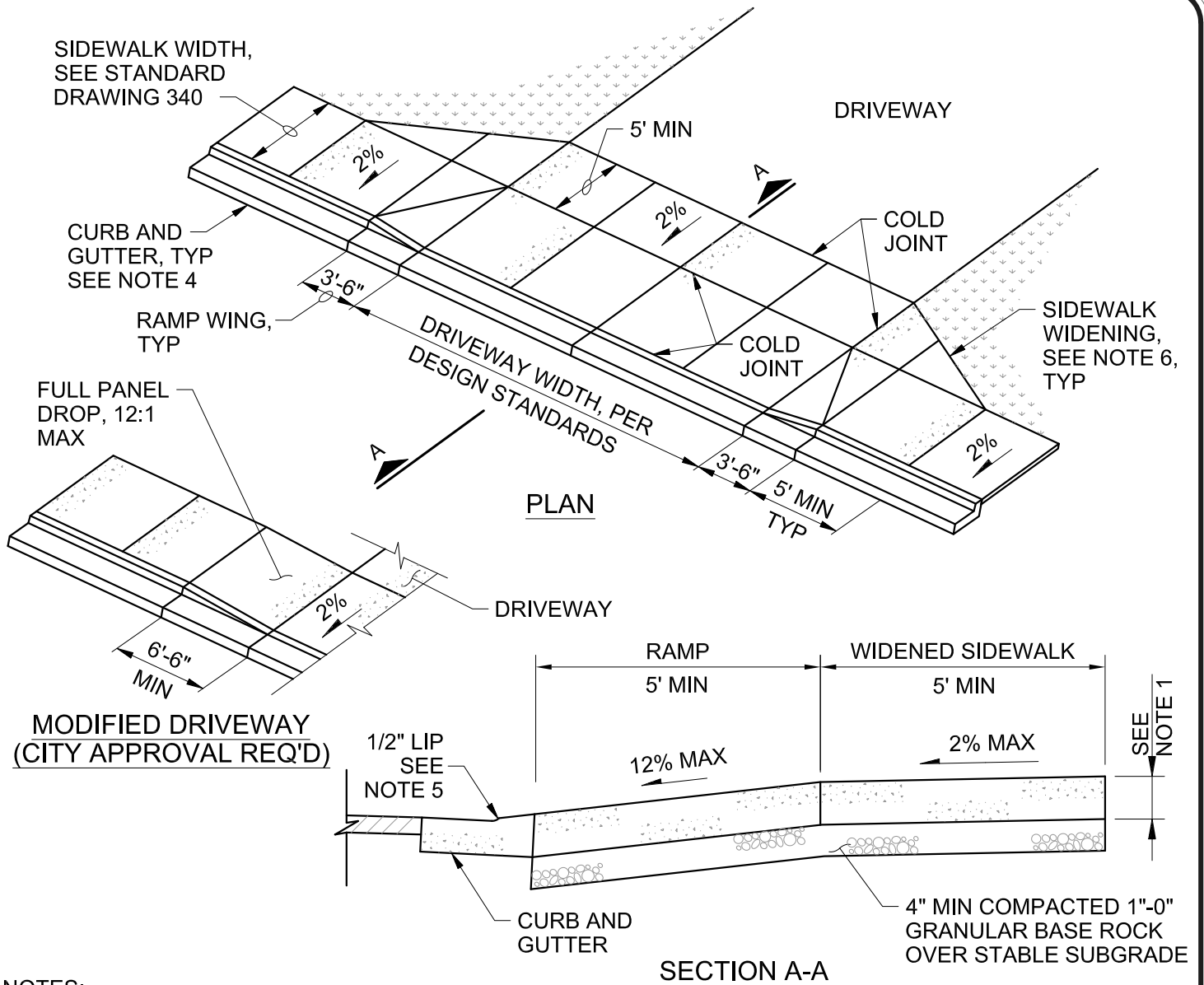
NO SCALE
DIVISION
STREET
DRAWING NO.
344



NOTES:

1. CONCRETE THICKNESS IN DRIVEWAYS SHALL BE 6" MIN. COMMERCIAL DRIVEWAYS SHALL BE 8" MIN. CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH.
2. SIDEWALK PANELS TO BE 5' LONG. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES IN DIRECTION. DRIVEWAYS 15' FEET AND WIDER SHALL HAVE A CONTRACTION JOINT AT THE MIDPOINT.
3. WHEN THE EXISTING DRIVEWAY CANNOT BE MATCHED TO FIT THE NEW DRIVEWAY APPROACH WITHIN THE SLOPE LIMITATIONS SHOWN, ADJUST THE EXISTING DRIVEWAY (BEHIND THE SIDEWALK), NOT THE CURB, RAMP, OR SIDEWALK GRADE. COORDINATE WITH CITY ENGINEER.
4. CHECK GUTTER FLOW DEPTH AT DRIVEWAY LOCATION TO ASSURE THAT THE DESIGN FLOOD DOES NOT OVERTOP THE BACK OF THE SIDEWALK AT THE DRIVEWAY. IF OVERTOPPING WILL OCCUR, PLACE AN INLET AT THE UPSTREAM SIDE OF THE DRIVEWAY OR PERFORM OTHER APPROVED DESIGN MITIGATION.
5. SEE STANDARD DRAWING 334 FOR CURB KNOCKOUT REQUIREMENTS AT INFILL AND/OR RETROFIT LOCATIONS.

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	REVIEWED BY	DRIVEWAY WITH PROPERTY LINE SIDEWALKS		DIVISION
	JTA / LSL 09/21			STREET
	NAME DATE			DRAWING NO.
REVISIONS			346	




NOTES:

1. CONCRETE THICKNESS IN DRIVEWAYS SHALL BE 6" MIN. COMMERCIAL DRIVEWAYS SHALL BE 8" MIN. CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH.
2. SIDEWALK PANELS TO BE 5' LONG. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES IN DIRECTION. DRIVEWAYS 15' FEET AND WIDER SHALL HAVE A CONTRACTION JOINT AT THE MIDPOINT.
3. WHEN THE EXISTING DRIVEWAY CANNOT BE MATCHED TO FIT THE NEW DRIVEWAY APPROACH WITHIN THE SLOPE LIMITATIONS SHOWN, ADJUST THE EXISTING DRIVEWAY (BEHIND THE SIDEWALK), NOT THE CURB, RAMP, OR SIDEWALK GRADE. COORDINATE WITH CITY ENGINEER.
4. CHECK GUTTER FLOW DEPTH AT DRIVEWAY LOCATION TO ASSURE THAT THE DESIGN FLOOD DOES NOT OVERTOP THE BACK OF THE SIDEWALK AT THE DRIVEWAY. IF OVERTOPPING WILL OCCUR, PLACE AN INLET AT THE UPSTREAM SIDE OF THE DRIVEWAY OR PERFORM OTHER APPROVED DESIGN MITIGATION.
5. SEE STANDARD DRAWING 334 FOR CURB KNOCKOUT REQUIREMENTS AT INFILL AND/OR RETROFIT LOCATIONS.
6. ADDITIONAL PUBLIC RIGHT OF WAY OR SIDEWALK EASEMENT MAY BE REQUIRED TO MEET MINIMUM SIDEWALK WIDTH REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS

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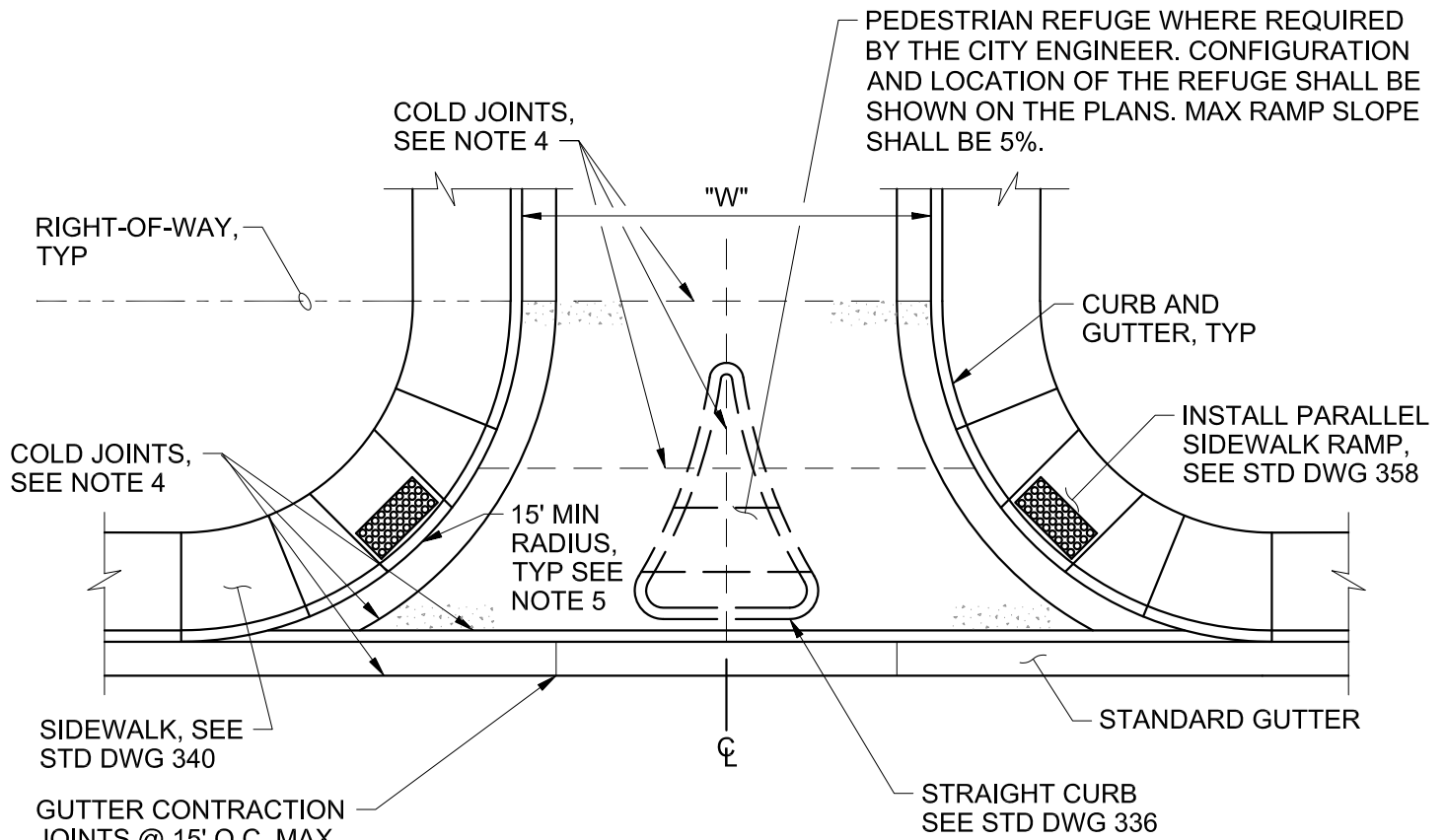


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REVISIONS	

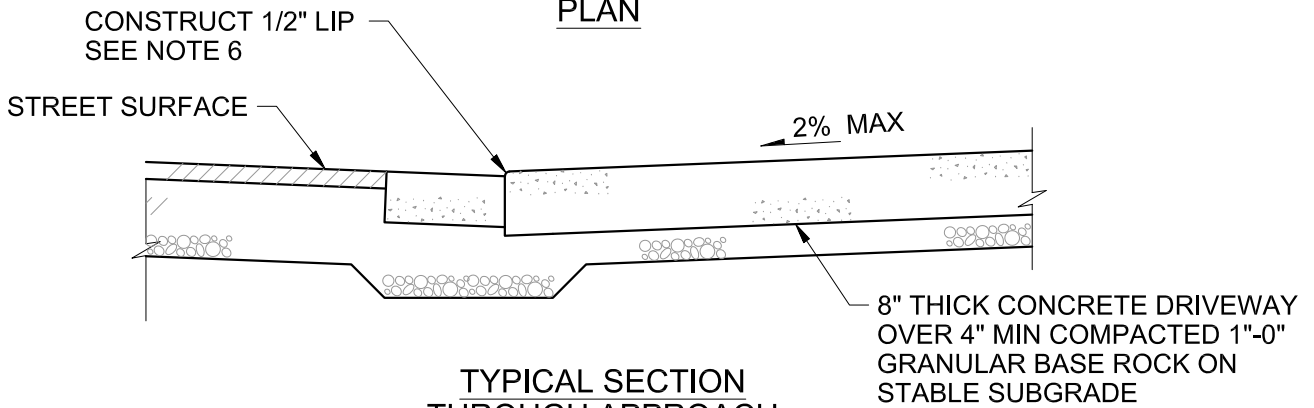
STANDARD DRAWING TITLE

DRIVEWAY WITH CURBLINE SIDEWALKS

NO SCALE
DIVISION
STREET
DRAWING NO.
348



PLAN



TYPICAL SECTION THROUGH APPROACH

NOTES:

1. THIS TYPE OF APPROACH SHALL NOT BE USED WITHOUT APPROVAL OF THE CITY ENGINEER.
2. "W" = WIDTH REQUIREMENTS AS SPECIFIED IN THE DEVELOPMENT CODE, OR AS INDICATED ON PLANS.
3. ALL CONCRETE FOR COMMERCIAL DRIVEWAY TO HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI.
4. PROVIDE COLD JOINTS AS SPECIFIED AT 15' O.C. MAX.
5. LARGER RADIUS MAY BE REQUIRED FOR BUS AND TRUCK TRAFFIC, AS APPROVED BY CITY ENGINEER.
6. SEE STANDARD DRAWING 334 FOR CURB KNOCKOUT REQUIREMENTS AT INFILL AND/OR RETROFIT LOCATIONS.

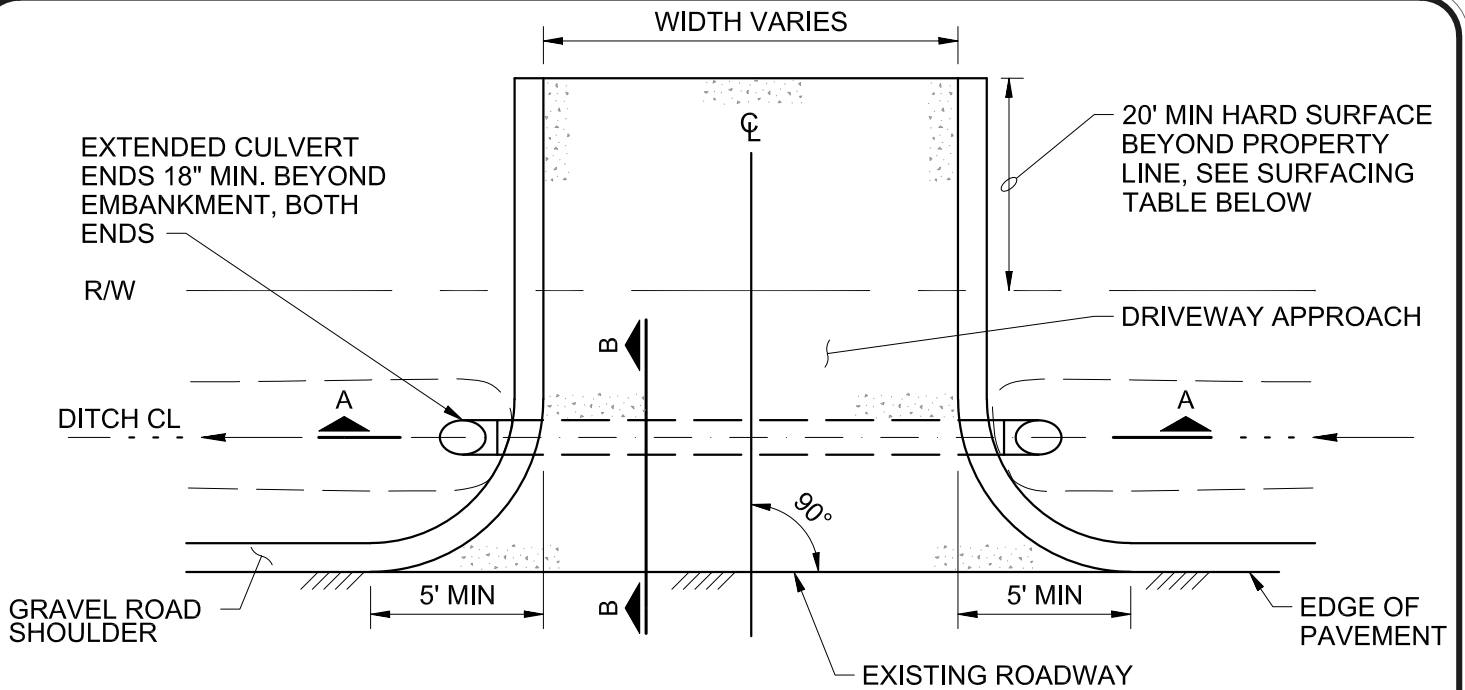


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STANDARD DRAWING TITLE
**CURB RETURN
 FOR COMMERCIAL
 DRIVEWAY APPROACH**

NO SCALE
DIVISION
STREET
DRAWING NO.
350



EXTENDED CULVERT ENDS 18" MIN. BEYOND EMBANKMENT, BOTH ENDS

R/W

DITCH CL

GRAVEL ROAD SHOULDER

5' MIN

90°

EXISTING ROADWAY

5' MIN

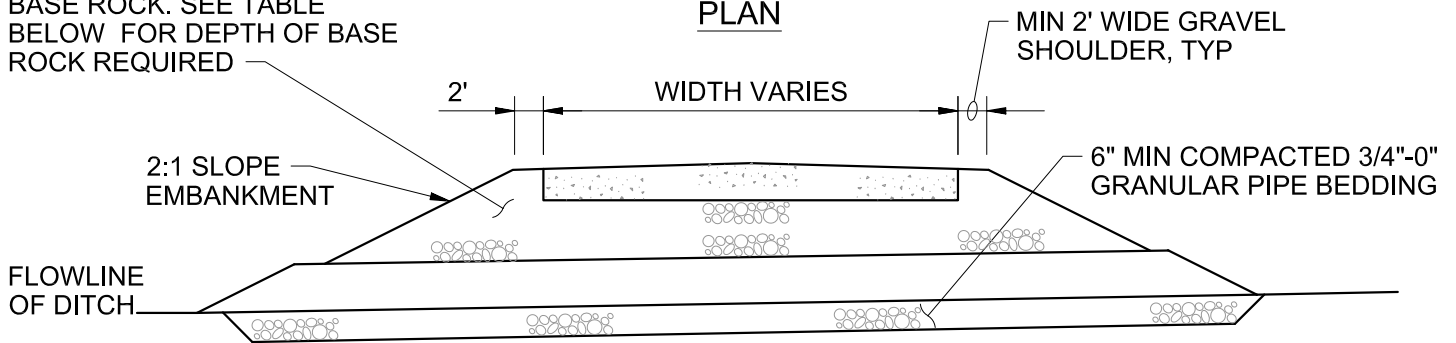
EDGE OF PAVEMENT

20' MIN HARD SURFACE BEYOND PROPERTY LINE, SEE SURFACING TABLE BELOW

DRIVEWAY APPROACH

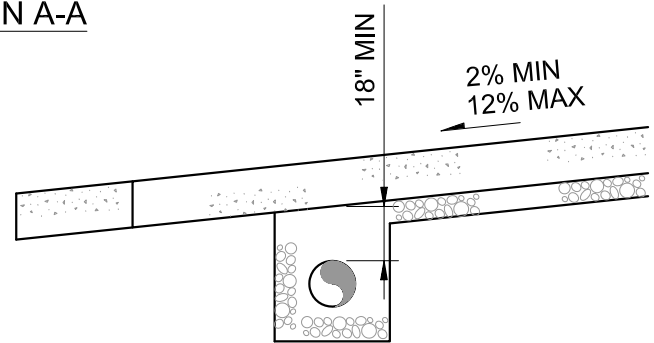
COMPACTED 1"-0" GRANULAR BASE ROCK. SEE TABLE BELOW FOR DEPTH OF BASE ROCK REQUIRED

PLAN



SECTION A-A


SURFACING MATERIAL	SURFACING REQUIREMENTS	BASE ROCK REQUIREMENTS
CONCRETE	6" MIN 3,300 PSI PCC PVMT	4" MIN OF 1"-0" GRANULAR BASE ROCK
ASPHALT CONCRETE PAVEMENT	3" MIN ASPHALT CONC PVMT	8" MIN OF 1"-0" GRANULAR BASE ROCK



SECTION B-B

NOTES:

1. ALL SURFACE MATERIALS, BASE ROCK, AND TRENCH BACKFILL SHALL BE COMPACTED AS SPECIFIED.
2. A CONCRETE OR ASPHALT SURFACE SHALL BE INSTALLED TO CONNECT THE DRIVEWAY AND PAVEMENT.
3. ROADSIDE DITCHES SHALL NOT BE FILLED IN EXCEPT AT DRIVEWAY LOCATIONS WITH CULVERT.



DEPARTMENT OF PUBLIC WORKS

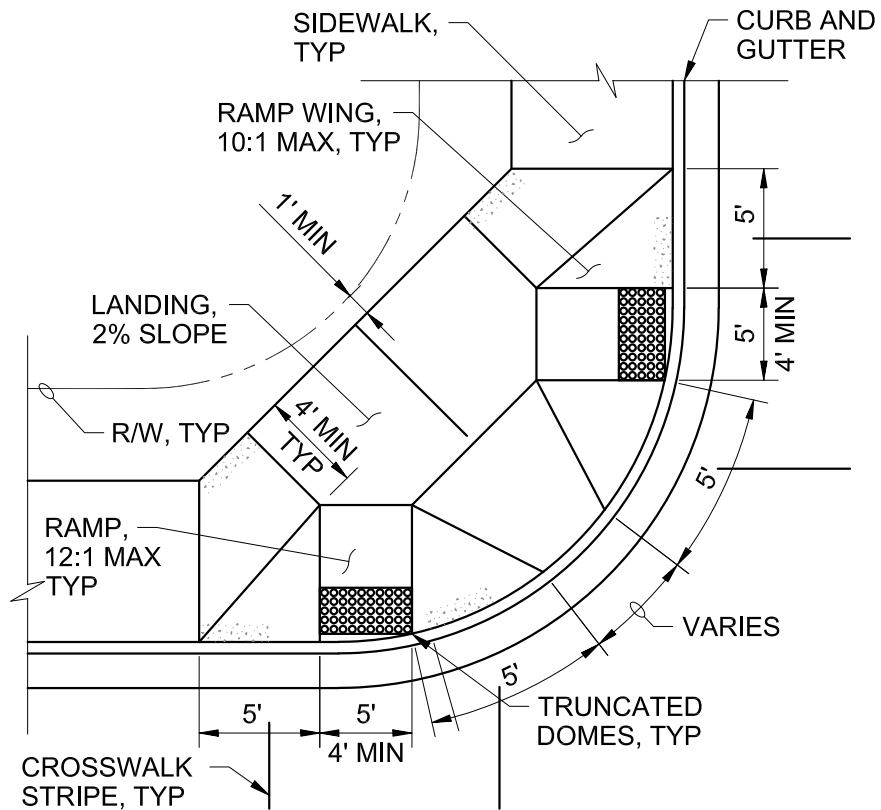
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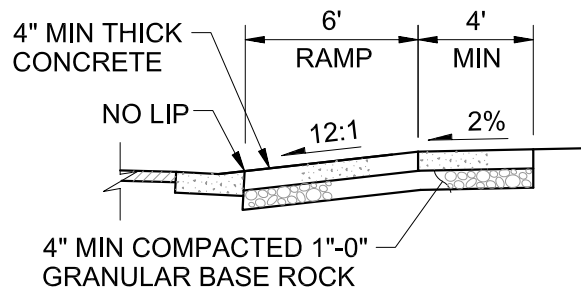
STANDARD DRAWING TITLE

TYPICAL DRIVEWAY APPROACH FOR UNIMPROVED STREETS

NO SCALE
DIVISION
STREET
DRAWING NO.
352



INTERSECTION RAMP FOR CURBLINE SIDEWALKS



TYPICAL SECTION THROUGH RAMP

NOTES:

1. RAMPS AND SIDEWALKS SHOWN ARE TO BE CONSTRUCTED WITH THE STREET IMPROVEMENTS.
2. CONCRETE SHALL BE 3,300 PSI AT 28-DAY STRENGTH.
3. DETECTABLE WARNING PANEL SHALL BE LISTED ON THE ODOT QUALIFIED PRODUCTS LIST. PANELS ARE TO BE BRICK RED IN COLOR AND ARE TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN A MINIMUM 4" THICK CONCRETE UNDER THE DETECTABLE WARNING PANEL.
4. ALL RAMPS AND TRANSITIONS SHALL BE ADA COMPLIANT. A 4' MIN LANDING SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION.
5. NO UTILITY STRUCTURES (CLEANOUTS, VALVE BOXES, ETC) ARE PERMITTED WITHIN RAMP AREA.



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STANDARD DRAWING TITLE

**INTERSECTION RAMPS
FOR CURBLINE
SIDEWALKS**

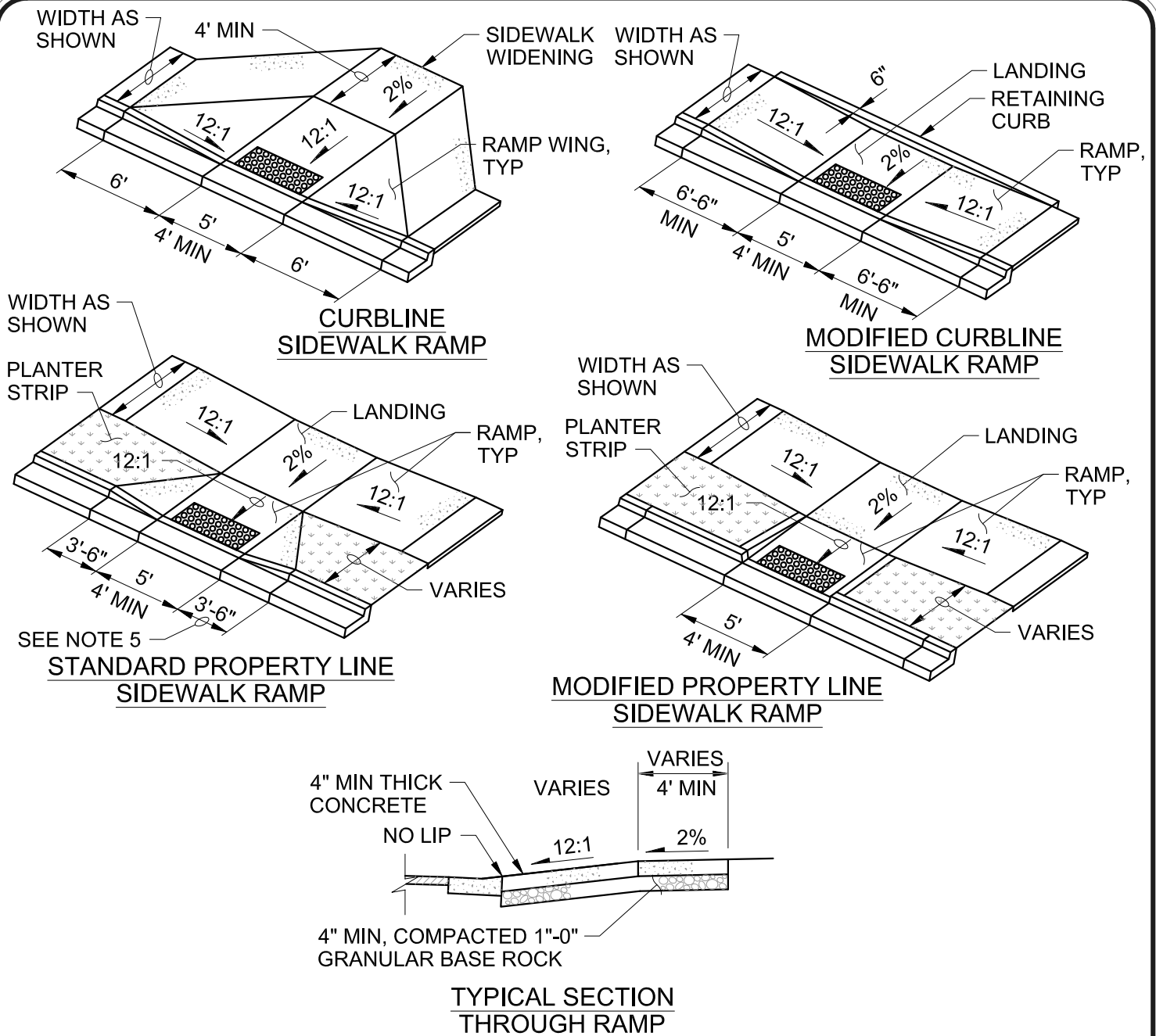
NO SCALE

DIVISION

STREET


DRAWING NO.

356



NOTES:

1. RAMPS AND SIDEWALKS SHOWN ARE TO BE CONSTRUCTED WITH THE STREET IMPROVEMENTS. CONCRETE SHALL BE 3,300 PSI AT 28-DAY STRENGTH. SEE STANDARD DRAWING 340 FOR SIDEWALK WIDTHS AND ADDITIONAL NOTES.
2. DETECTABLE WARNING PANEL SHALL BE LISTED ON THE ODOT QUALIFIED PRODUCTS LIST. PANELS ARE TO BE BRICK RED IN COLOR AND ARE TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN A MINIMUM 4" THICK CONCRETE UNDER THE DETECTABLE WARNING PANEL.
3. ALL RAMPS AND TRANSITIONS SHALL BE ADA COMPLIANT. A 4' MIN LANDING SHALL BE PLACED AT THE TOP OF EACH RAMP WHERE SHOWN. LANDING SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION.
4. NO UTILITY STRUCTURES (CLEANOUTS, VALVE BOXES, ETC) ARE PERMITTED WITHIN RAMP AREA.
5. IF PLANTER STRIP IS CONCRETE OR ASPHALT CONCRETE PAVEMENT, RAMP WING SHALL BE 12:1 MAX.



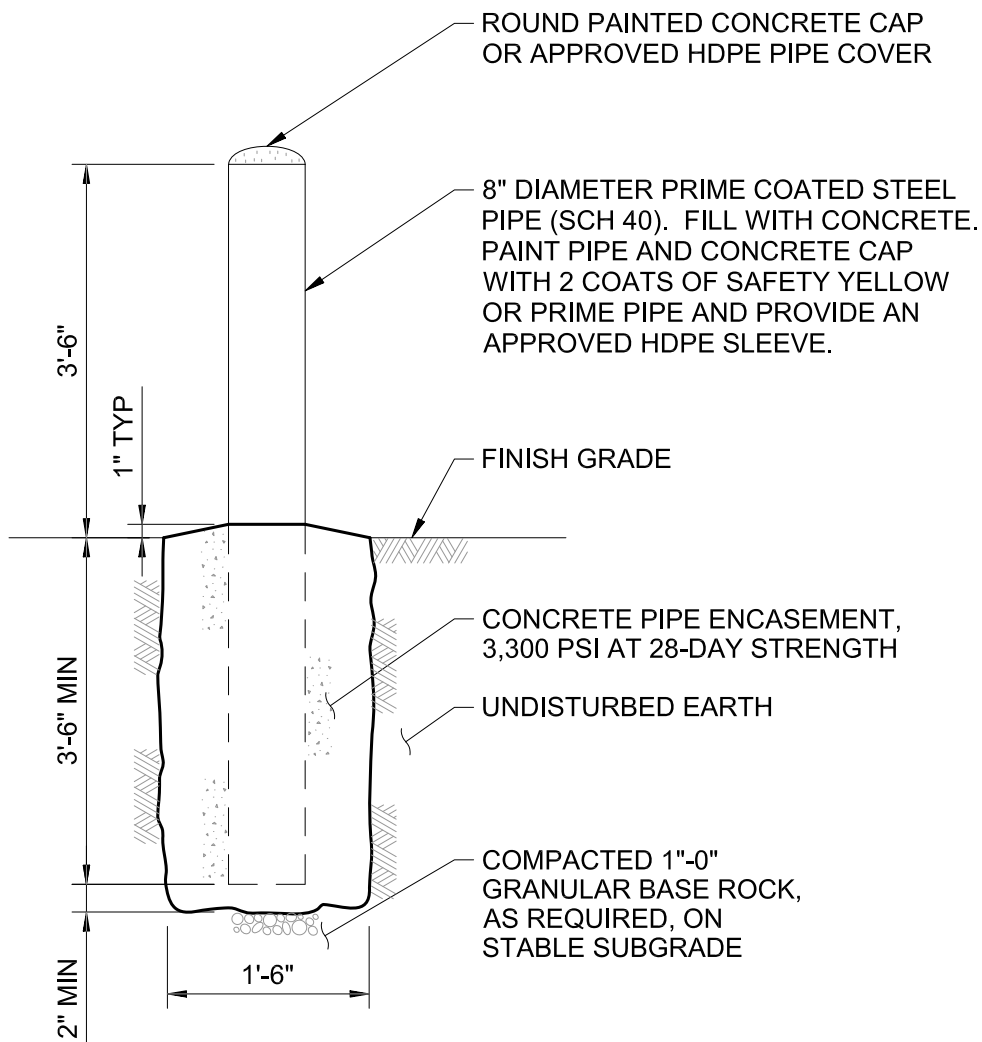
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STANDARD DRAWING TITLE

PARALLEL SIDEWALK RAMPS

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358



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STANDARD DRAWING TITLE

TYPICAL
BOLLARD

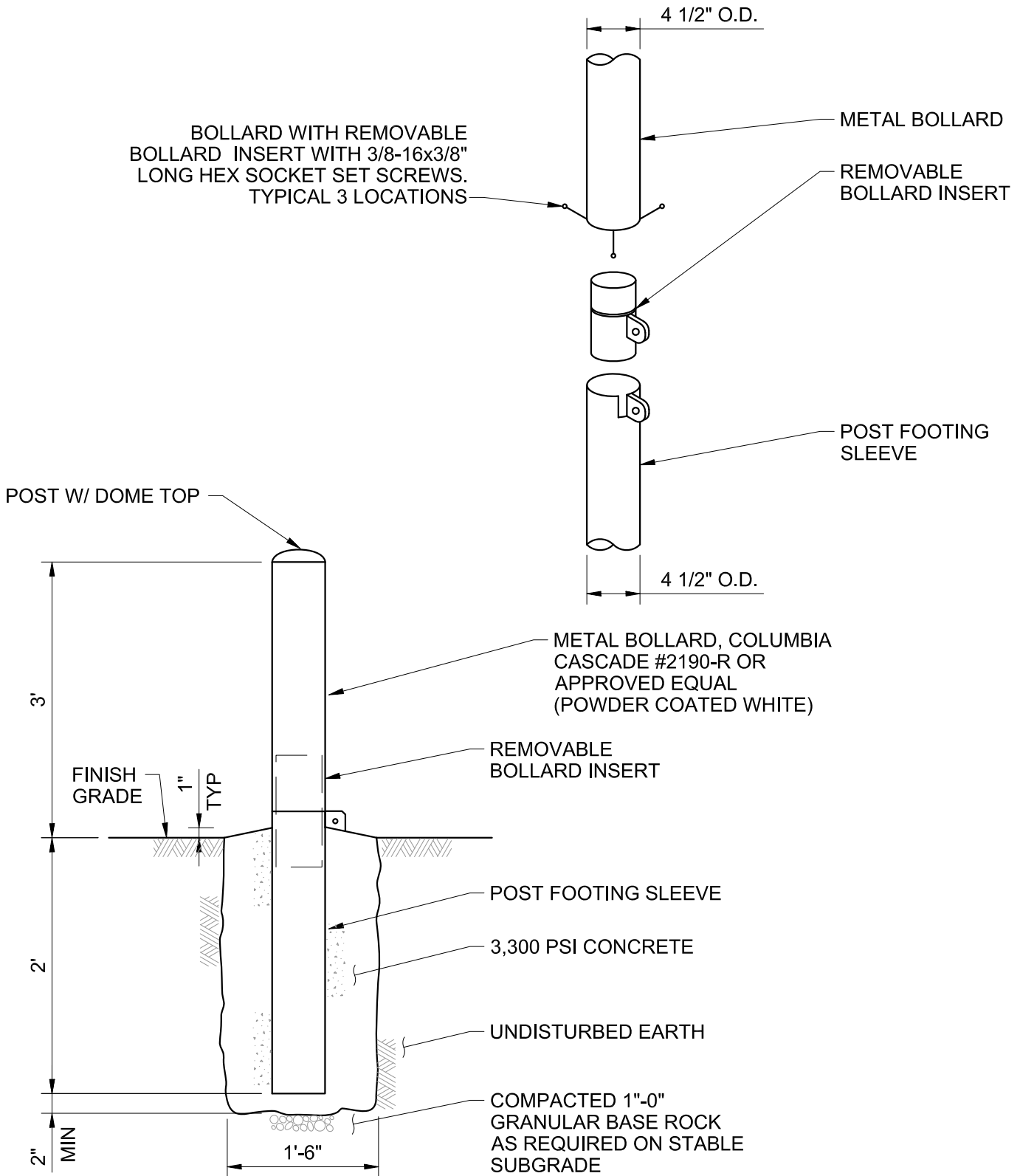
NO SCALE

DIVISION

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360



NOTES:

1. LOCK TAB TO BE ORIENTED OPPOSITE THE DIRECTION OF VEHICULAR ACCESS.
2. DECORATIVE BOLLARD MAY BE APPROVED BY CITY ENGINEER.



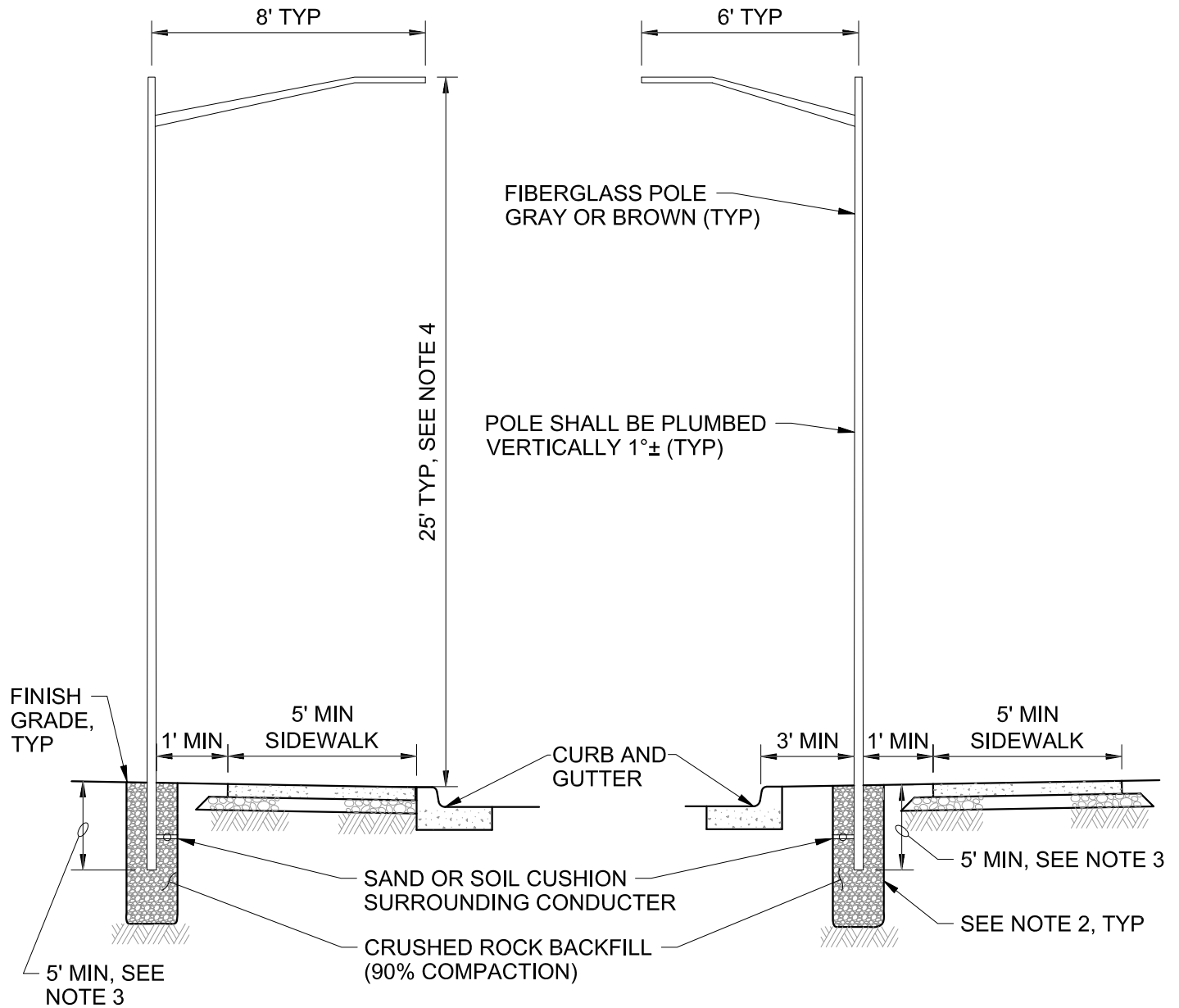
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STANDARD DRAWING TITLE

REMOVABLE BOLLARD

NO SCALE
DIVISION
STREET
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362




**TYPICAL STREET LIGHT POLE
CURBLINE SIDEWALK**

**TYPICAL STREET LIGHT POLE
PROPERTY LINE SIDEWALKS**

NOTES:

1. CONTRACTOR TO COORDINATE STREET LIGHT INSTALLATION WITH PACIFIC POWER.
2. MINIMUM HOLE DIAMETER TO BE 2x THE POLE BASE DIAMETER.
3. MINIMUM DIRECT BURIAL DEPTH EQUAL TO 5' OR GREATER, AS REQUIRED BY MANUFACTURER.
4. FOR MAJOR COLLECTOR AND ARTERIAL STREETS, POLE HEIGHT SHALL BE 30' FROM FINISH GRADE.
5. DECORATIVE STREET LIGHT LOCATION SHALL BE AS DETERMINED BY CITY ENGINEER.



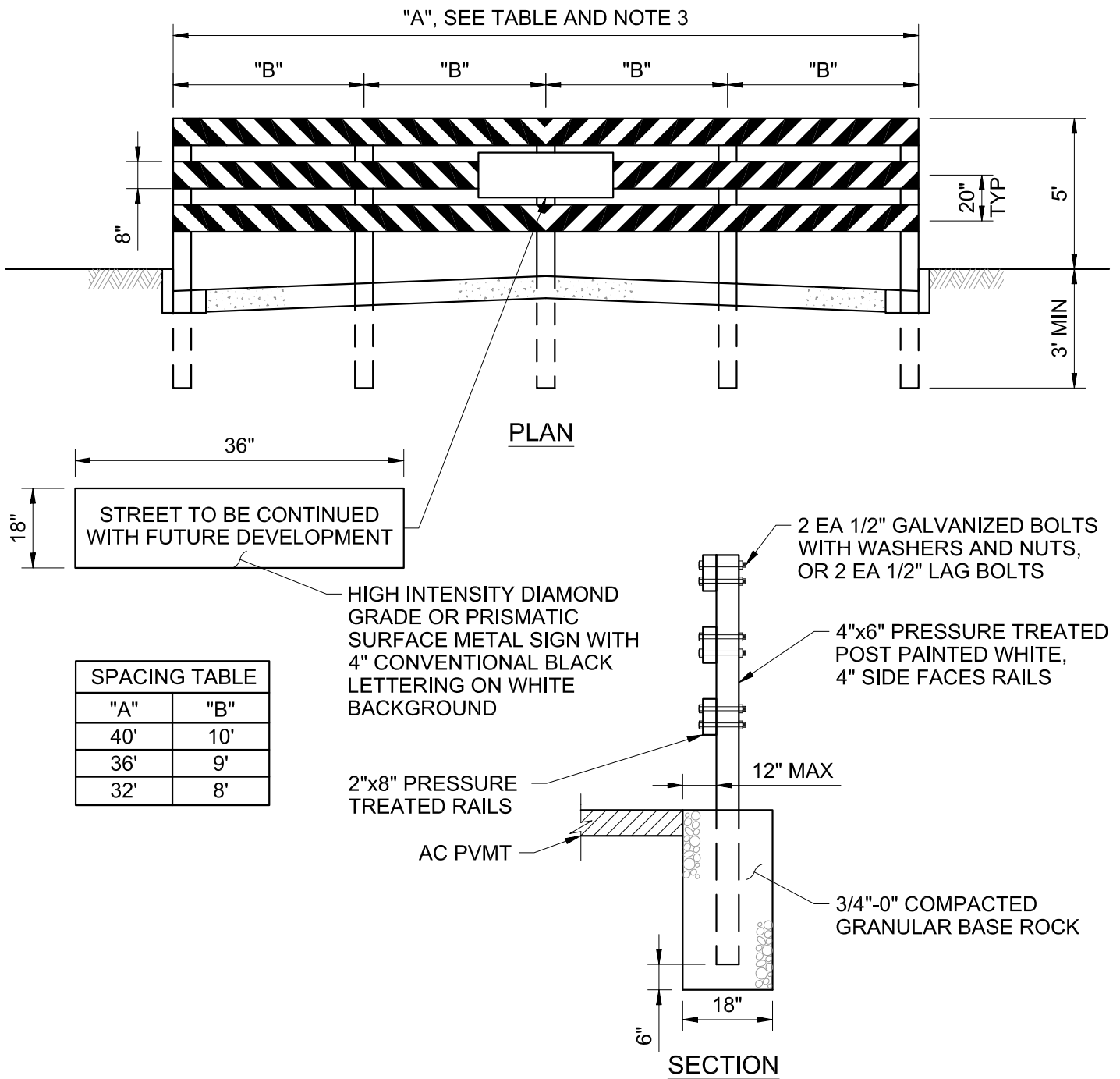
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TYPICAL STREET LIGHT POLE

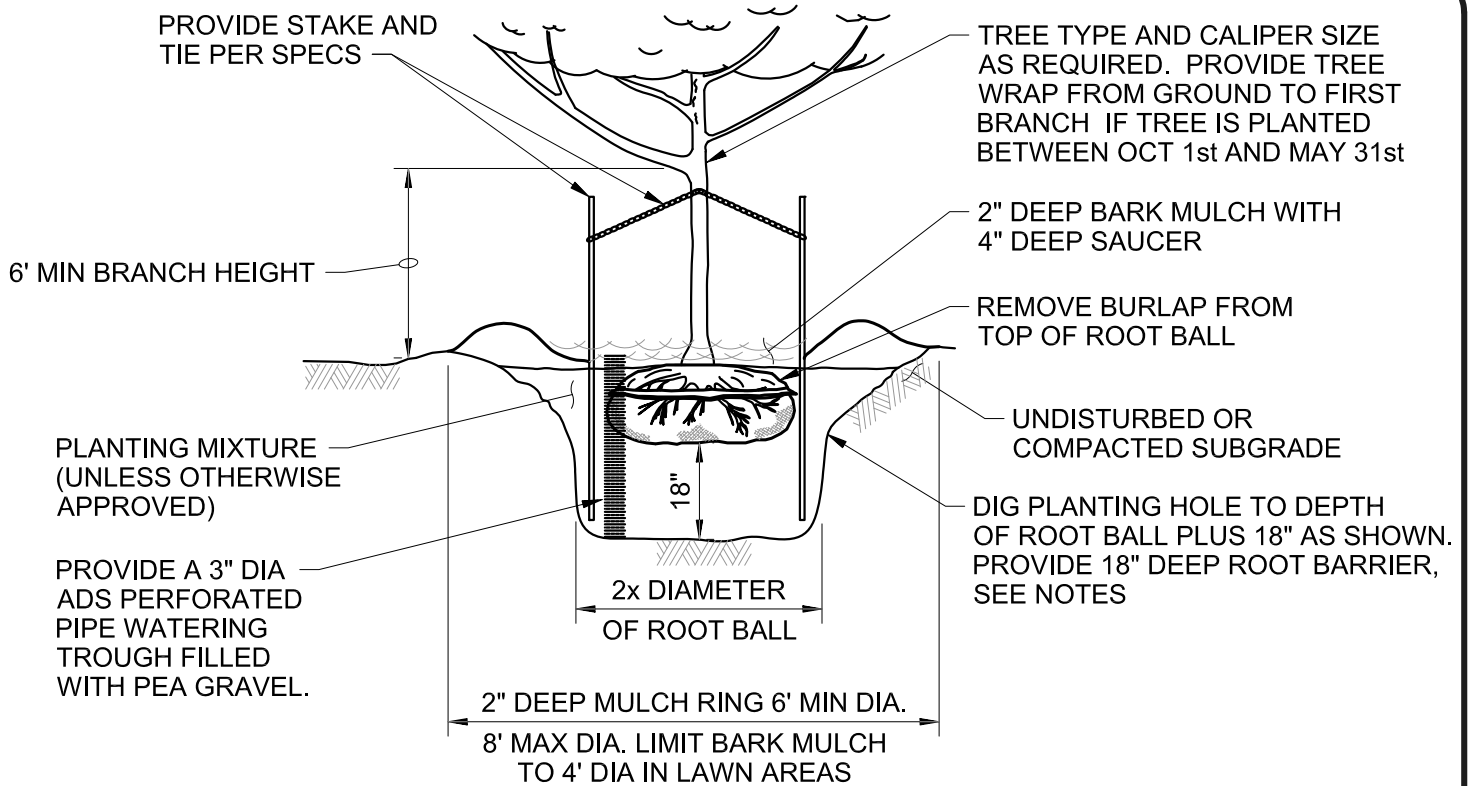
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364



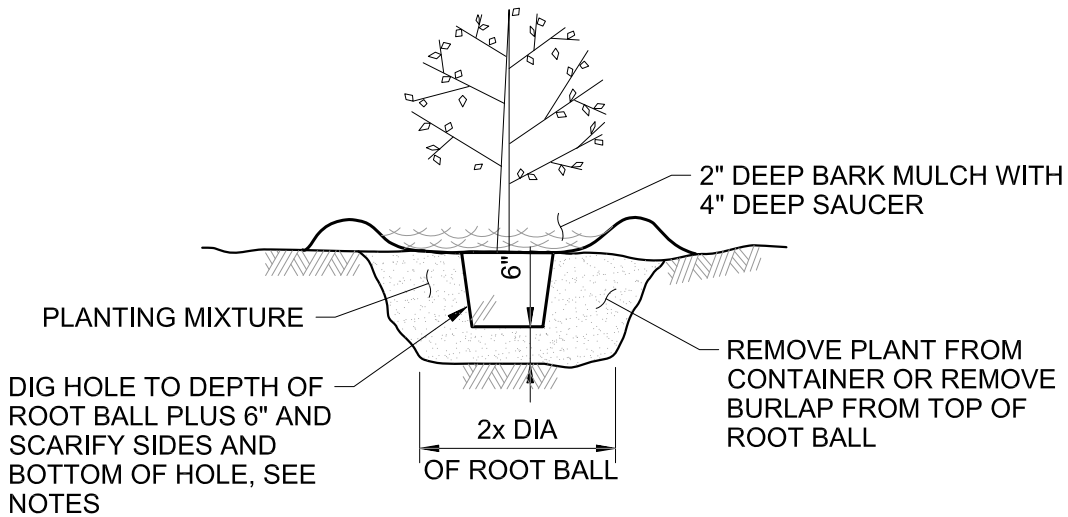
NOTES:

1. STRIPING SHALL BE ALTERNATING RED AND WHITE RETROREFLECTIVE STRIPES 6" IN WIDTH AT A 45-DEGREE ANGLE AND SHALL BE EITHER RETRO-REFLECTIVE TAPE OR PAINTED WITH A SEALED RETRO-REFLECTIVE SURFACE.
2. ALL SIGNS SHALL CONFORM TO THE CURRENT VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THIS BARRICADE SHALL CONFORM TO SECTION 6F.68 OF THE MUTCD.
3. FOR STREETS THAT DO NOT FIT STANDARD WIDTHS, EQUAL SPACING BETWEEN POSTS SHALL BE MAINTAINED NOT TO EXCEED 10' AND SHALL BE CENTERED ON STREET CENTERLINE.

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		STREET BARRICADE	366



STREET TREE PLANTING DETAIL



SHRUB PLANTING DETAIL

NOTES:

1. IF DRAINAGE IS POOR, ELEVATE ROOT BALL 2" ABOVE GRADE AND SLOPE PLANTING MIXTURE AWAY FROM TRUNK. FORM A 4' DIAMETER SAUCER AROUND TRUNK. UNDER NO CONDITIONS SHOULD FILL BE PLACED IN CONTACT WITH TRUNK OR TOP OF BALL BE EXPOSED.
2. PLANT GROUND COVER AND SHRUBS IN ALTERNATING STAGGERED ROWS.
3. AN 18" DEEP APPROVED ROOT BARRIER SHALL BE PLACED AROUND EDGE OF STREET TREE PLANTING HOLE.



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STREET TREE AND SHRUB PLANTING

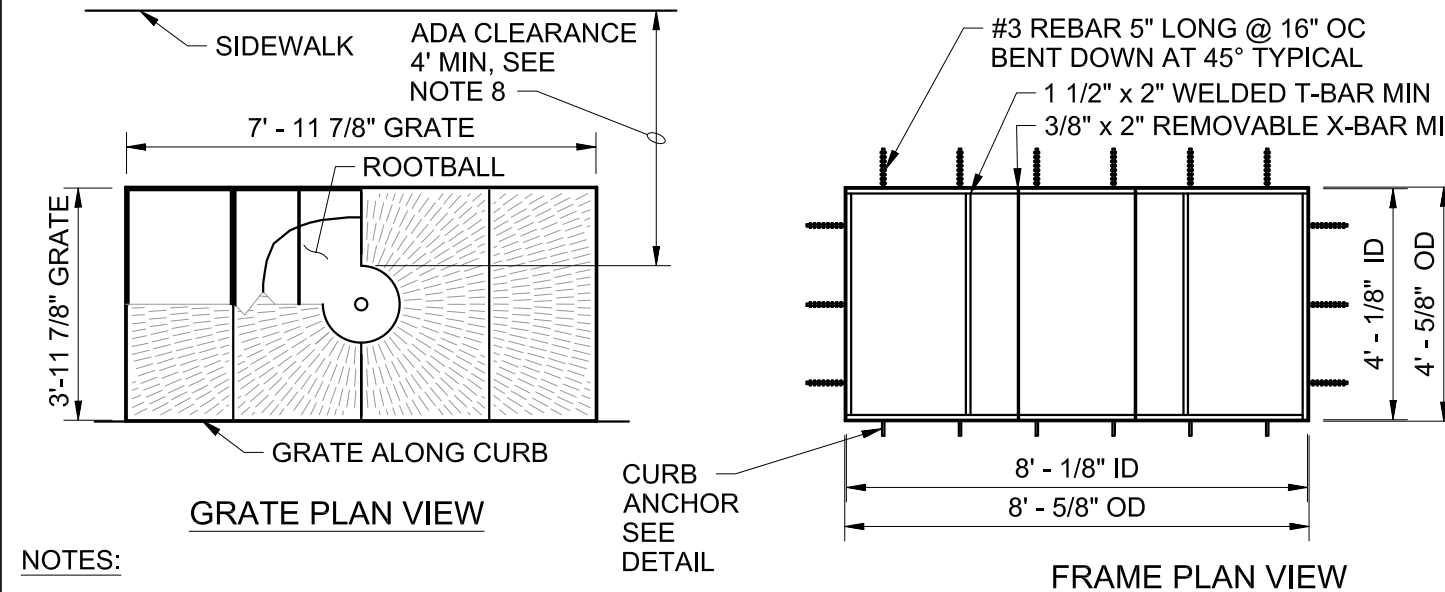
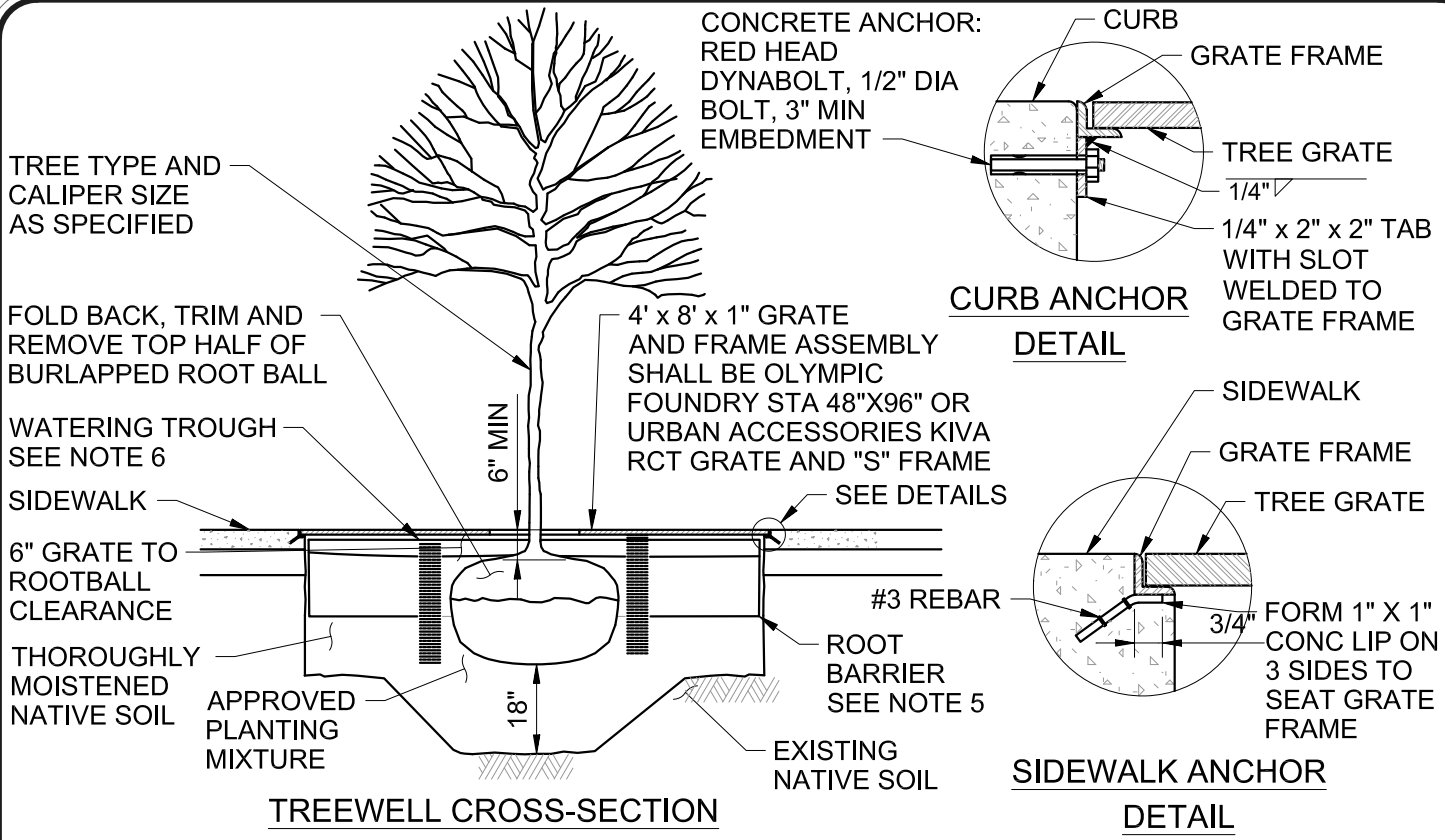
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DIVISION

STREET

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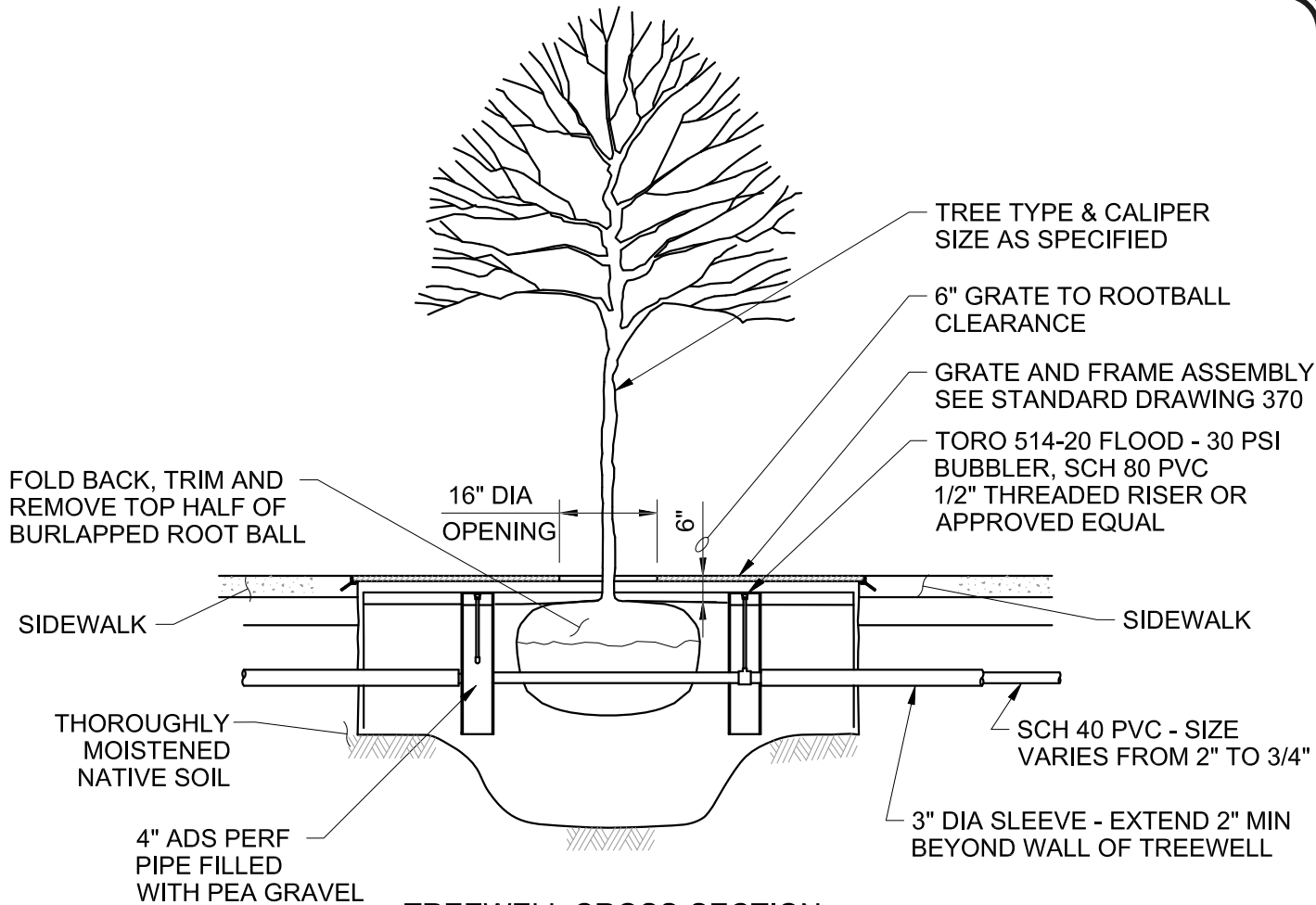
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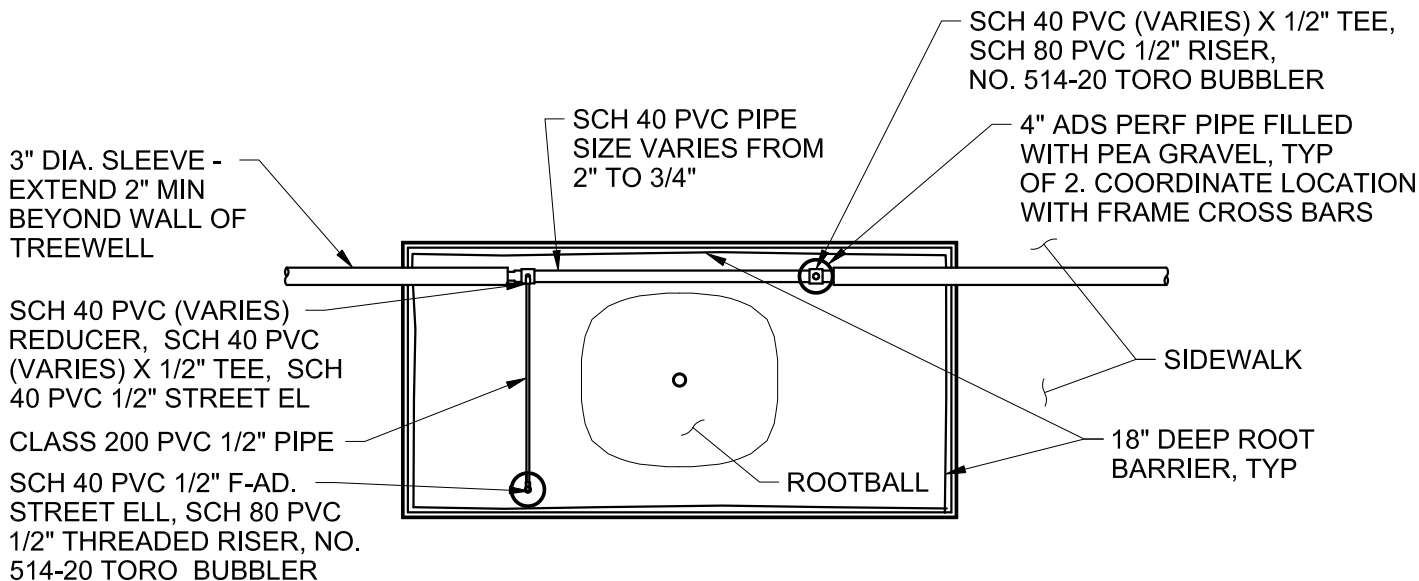
NOTES:

1. GRATES ARE TO BE MADE OF CAST IRON WITH NATURAL FINISH.
2. CASTINGS WILL BE 3/4" THICK IN FOUR PIECES.
3. THE CENTER OPENING SHALL BE 16" DIA WITH A BREAKOUT AT 23 1/2".
4. SLOTTED PENETRATIONS SHALL BE NO GREATER THAN 3/8" WIDE.
5. AN 18" DEEP APPROVED ROOT BARRIER SHALL BE PLACED AROUND PLANTING HOLE.
6. PROVIDE TWO 4" DIA ADS PERFORATED PIPE WATERING TROUGHS FILLED WITH PEA GRAVEL.
7. DO NOT UNDERMIND CURB OR SIDEWALK WHEN EXCAVATING.
8. ADA CLEARANCE SHALL BE 4' AS SHOWN, UNLESS OTHERWISE PERMITTED BY CITY ENGINEER.
9. SEE STANDARD DRAWING 372 FOR IRRIGATION DETAILS.


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	REVIEWED BY	DOWNTOWN STREET TREE WELL GRATE DETAIL		DIVISION
	JTA / LSL 09/21			STREET
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TREEWELL CROSS-SECTION



TREEWELL PLAN VIEW



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STANDARD DRAWING TITLE

DOWNTOWN STREET TREE WELL IRRIGATION SYSTEM

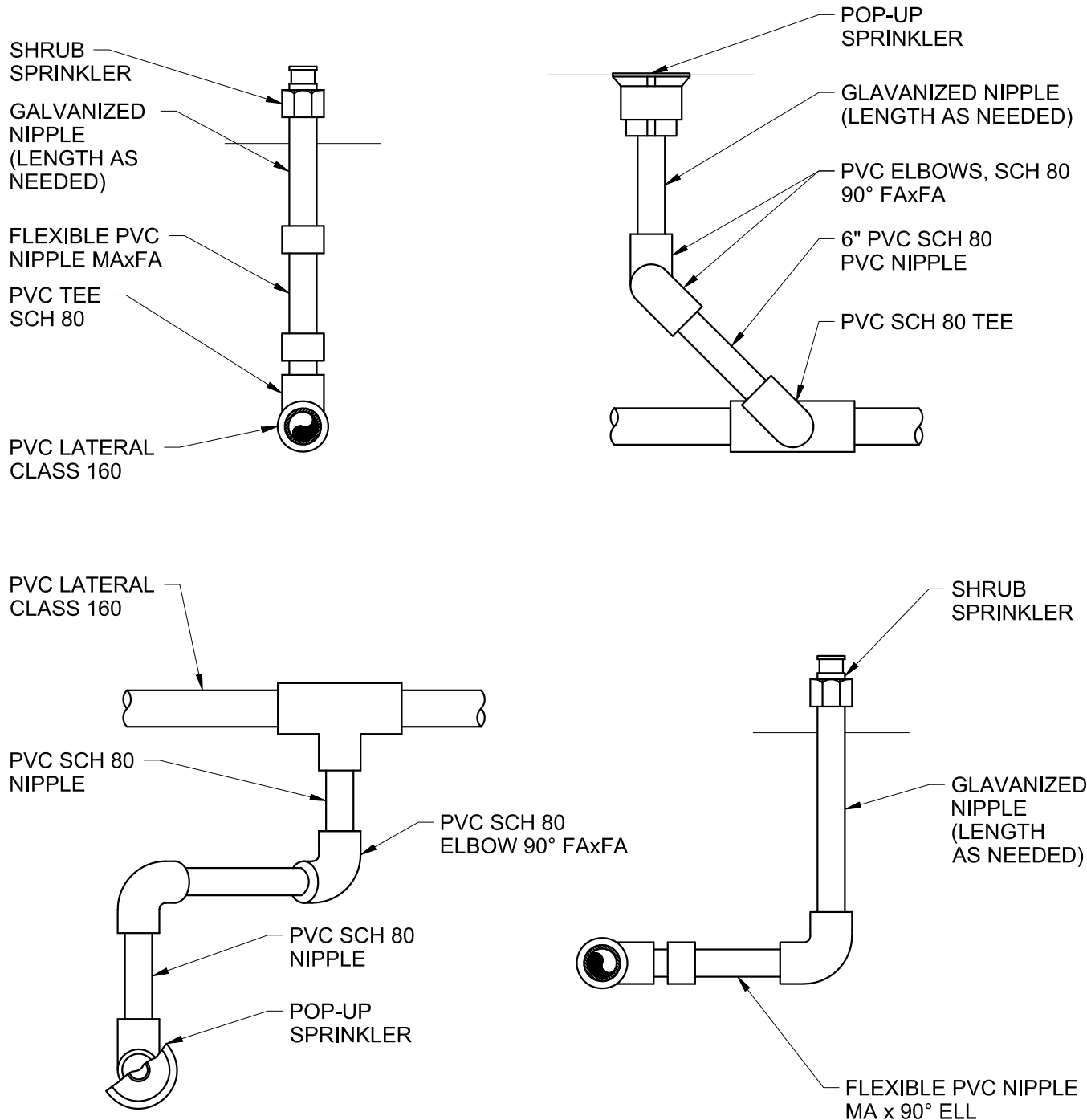
NO SCALE

DIVISION

STREET

DRAWING NO.

372



NOTES:

1. ALL PVC NIPPLES SHALL BE THREADED TYPE.
2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.
3. ON SOME APPLICATIONS, NIPPLES WITH ELBOW ARRANGEMENT MAY BE REPLACED WITH PVC ELBOW HAVING MAxFA THREADS.



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STANDARD DRAWING TITLE

**IRRIGATION SYSTEM
SWING JOINT
RISER ASSEMBLY**

NO SCALE

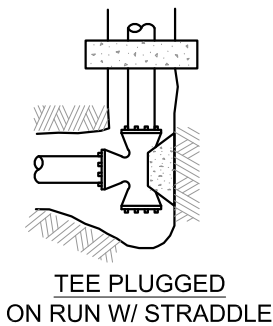
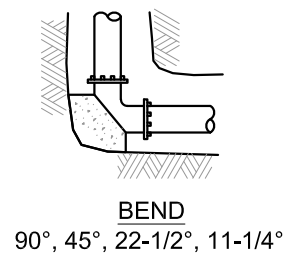
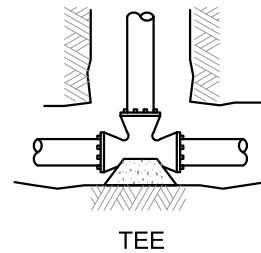
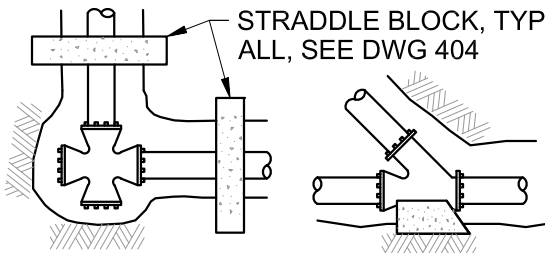
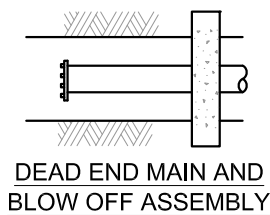
DIVISION

STREET

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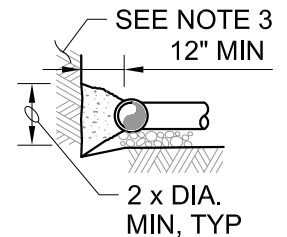
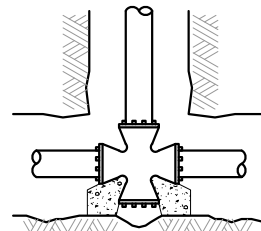
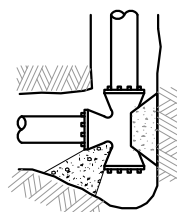
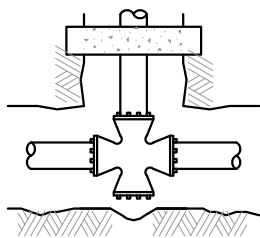
374

HORIZONTAL BEARING AREA OF THRUST BLOCKS (SQUARE FEET)					
FITTING SIZE	HYDRANT, TEE AND WYE	90° BEND, PLUGGED CROSS, AND TEE PLUGGED ON RUN	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	1.9	2.7	1.4	1.0	1.0
6"	4.2	6.0	3.2	1.7	1.0
8"	7.5	10.7	5.8	2.9	1.5
10"	11.8	16.7	9.0	4.6	2.3
12"	17.0	24.0	13.0	6.6	3.3
>16"	BY DESIGN ENGINEER				



CROSS PLUGGED FOR 90° BEND W/ STRADDLE

WYE



MINIMUM CONCRETE THRUST BLOCK CONFIGURATION

NOTES:

1. ALL NEW WATERLINES SHALL BE MECHANICALLY AND INTERNALLY RESTRAINED WHERE POSSIBLE. THE USE OF CONCRETE THRUST BLOCKING FOR NEW WATERLINES WILL BE LIMITED TO CERTAIN APPLICATIONS AND WILL REQUIRE APPROVAL OF THE CITY ENGINEER. SEE STANDARD DRAWING 406 FOR MECHANICAL JOINT RESTRAINT REQUIREMENTS. ALL CONCRETE THRUST BLOCKING, STRADDLE BLOCKING, AND MECHANICAL RESTRAINT LENGTHS SHALL BE REVIEWED BY THE DESIGN ENGINEER.
2. ABOVE BEARING AREAS ARE BASED ON THE FOLLOWING ASSUMPTIONS: TEST PRESSURE OF 150 PSI, A 1.5 FACTOR OF SAFETY, AND AN ALLOWABLE SOIL BEARING STRESS OF 1,500 PSF. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, CONTACT THE CITY ENGINEER.
3. CONTRACTOR SHALL PROVIDE BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE. THRUST BLOCKING CONFIGURATIONS MAY NOT WORK FOR ALL FITTINGS OR FITTING SIZES. CONFIRM USE OF BLOCKING CONFIGURATIONS WITH THE DESIGN ENGINEER. SPECIAL CARE SHALL BE TAKEN DURING CONSTRUCTION TO ENSURE CONCRETE BLOCKING IS POURED AGAINST UNDISTURBED SOIL.
4. CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 3,300 PSI. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN 8 MIL PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
5. CONCRETE GRAVITY BLOCKING IS NOT PERMITTED UNDER ANY CIRCUMSTANCES.
6. FOR CONFIGURATIONS SHOWN WITH CONCRETE STRADDLE BLOCKS, SEE STANDARD DRAWING 404.



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REVISIONS

STANDARD DRAWING TITLE

HORIZONTAL THRUST BLOCKING

NO SCALE

DIVISION

WATER

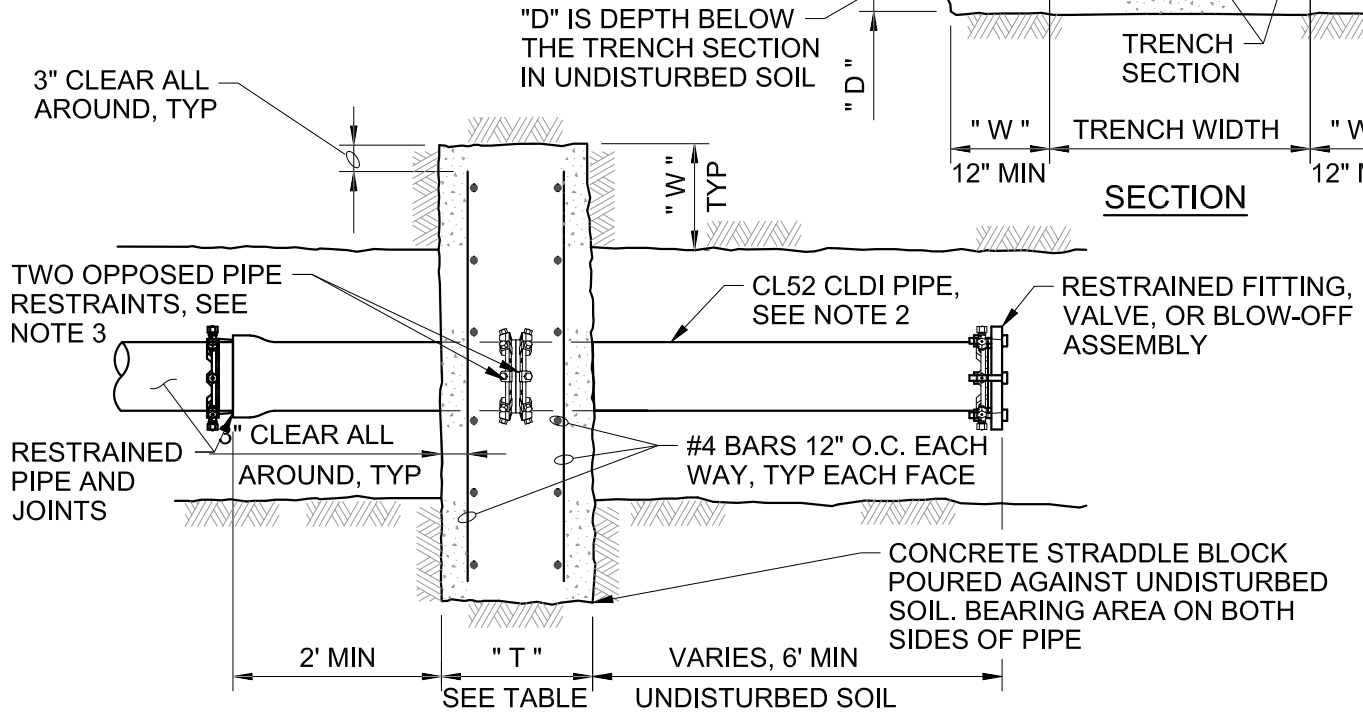
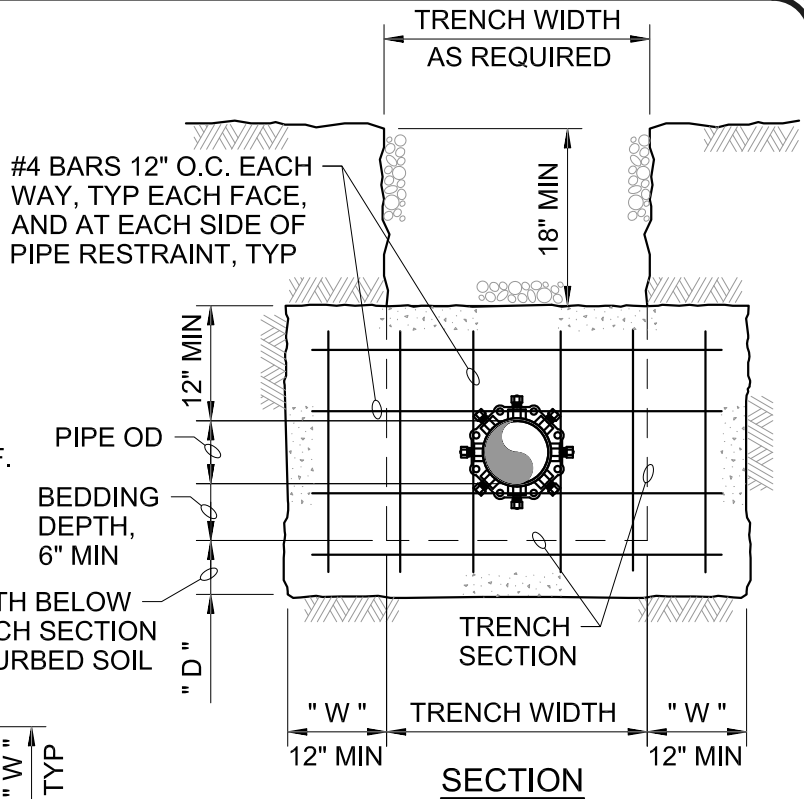
DRAWING NO.

402

MINIMUM BEARING AREA OF STRADDLE BLOCK RESTRAINT

NOMINAL PIPE SIZE (IN)	MIN BEARING AREA (SF)	MIN BLOCK SIZE (IN)		
		"W"	"D"	"T"
4"	2.7	12"	6"	12"
6"	6.0	12"	8"	18"
8"	10.7	18"	12"	18"
10"	16.7	24"	16"	18"
12"	24.0	30"	20"	18"
> 12"	BY DESIGN ENGINEER			


ABOVE BEARING AREAS ARE BASED ON THE FOLLOWING ASSUMPTIONS: TEST PRESSURE OF 150 PSI, A 1.5 FACTOR OF SAFETY, AND AN ALLOWABLE SOIL BEARING STRESS OF 1,500 PSF. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, CONTACT THE CITY ENGINEER.



NOTES:

PLAN

- CONTRACTOR SHALL PROVIDE CONCRETE BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURES. SPECIAL CARE SHALL BE TAKEN DURING CONSTRUCTION TO ENSURE CONCRETE BLOCKING IS POURED AGAINST UNDISTURBED SOIL AND AGAINST AND COMPLETELY SURROUNDING THE PIPE RESTRAINTS. ALL CONCRETE BLOCKING CONFIGURATIONS SHALL BE REVIEWED BY THE DESIGN ENGINEER.
- PIPE SHALL BE CL52 CLDI PIPE WITH NO JOINTS BETWEEN THE CONCRETE BLOCKING AND THE RESTRAINED FITTING, VALVE, OR BLOW-OFF ASSEMBLY BEING RESTRAINED BY THE CONCRETE BLOCKING. CONCRETE BLOCKING SHALL HAVE A MINIMUM OF 18" COVER AND CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 3,300 PSI.
- THE TWO OPPOSED PIPE RESTRAINTS SHALL BE MEGALUG MID SPAN PIPE RESTRAINTS OR APPROVED EQUAL, AND SHALL BE CENTERED IN THE CONCRETE BLOCKING AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. THE WEDGE-TYPE RESTRAINT AREA SHALL BE WRAPPED IN PLASTIC PRIOR TO CONCRETE PLACEMENT.



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STANDARD DRAWING TITLE

STANDARD STRADDLE BLOCK

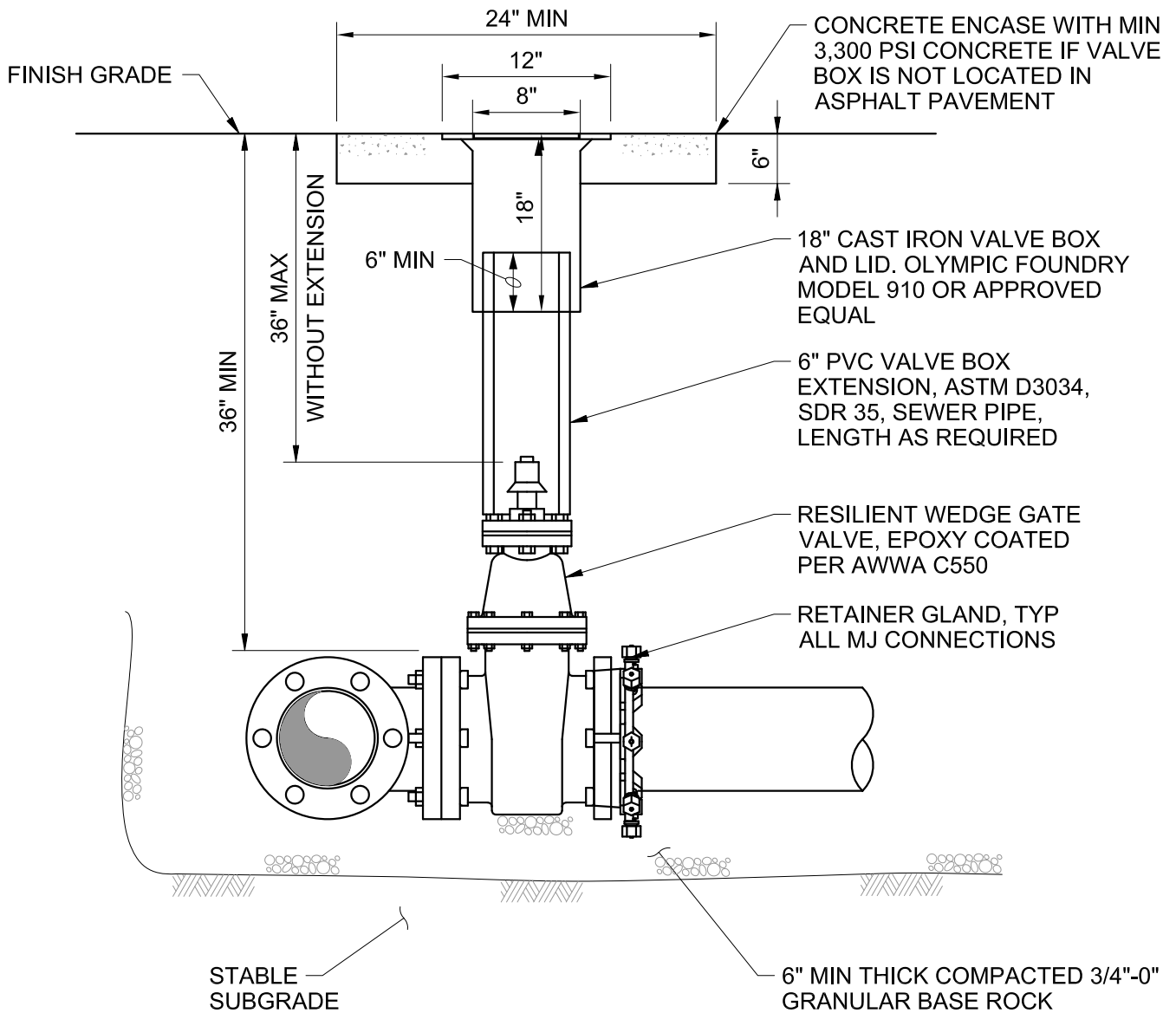
NO SCALE

DIVISION

WATER


DRAWING NO.

404



NOTES:

1. ALL DISTRIBUTION VALVES 2-INCH THROUGH 10-INCH DIAMETER SHALL BE RESILIENT-SEATED WEDGE NON-RISING STEM GATE VALVES CONFORMING TO AWWA C509 OR C515, AND EPOXY COATED PER AWWA C550. VALVES SHALL OPEN IN A COUNTER-CLOCKWISE DIRECTION.
2. ALL VALVES SHALL BE FLANGE CONNECTED TO ADJACENT TEES OR CROSSES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. ALL OPERATING NUTS SHALL BE 2-INCH SQUARE NUTS.
4. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE OPERATING NUT AND ADJUSTED TO MEET FINISH GRADE.
5. VALVE BOX EXTENSION SHALL BE A CONTINUOUS PVC PIPE WITH NO BELLS OR COUPLERS.



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STANDARD DRAWING TITLE

GATE VALVE AND VALVE BOX ASSEMBLY

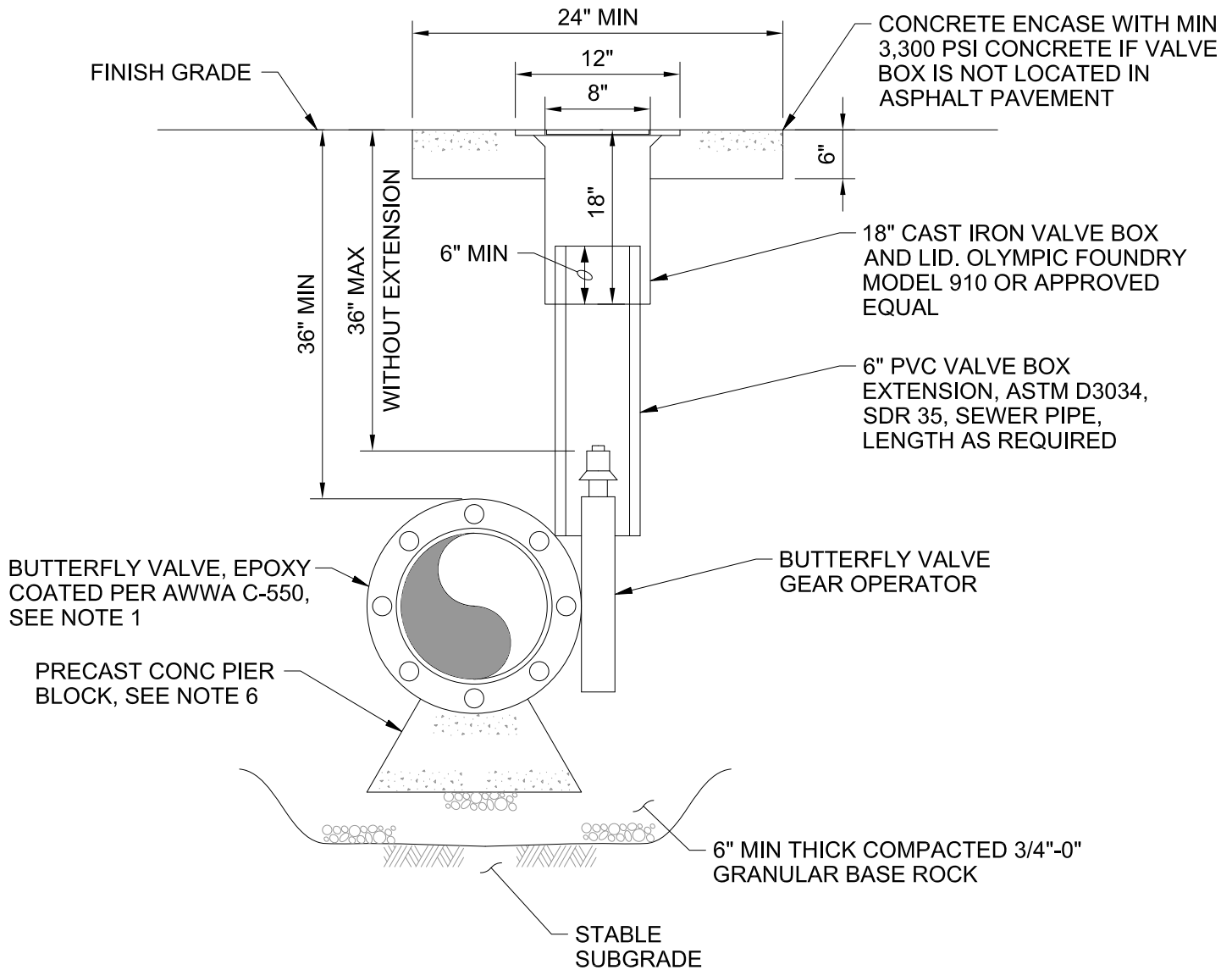
NO SCALE

DIVISION

WATER


DRAWING NO.

408



NOTES:

1. ALL DISTRIBUTION VALVES 12-INCH DIAMETER AND LARGER SHALL BE RUBBER SEATED, SHORT BODY, CLASS B BUTTERFLY VALVE CONFORMING TO AWWA C504, AND EPOXY COATED PER AWWA C550. VALVES SHALL OPEN IN A COUNTER-CLOCKWISE DIRECTION.
2. ALL VALVES SHALL BE FLANGE CONNECTED TO ADJACENT TEES OR CROSSES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. ALL OPERATING NUTS SHALL BE 2-INCH SQUARE NUTS.
4. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE OPERATING NUT AND ADJUSTED TO MEET FINISH GRADE.
5. VALVE BOX EXTENSION SHALL BE A CONTINUOUS PVC PIPE WITH NO BELLS OR COUPLERS.
6. PRECAST CONCRETE PIER BLOCK SHALL COMPLETELY SUPPORT THE VALVE.



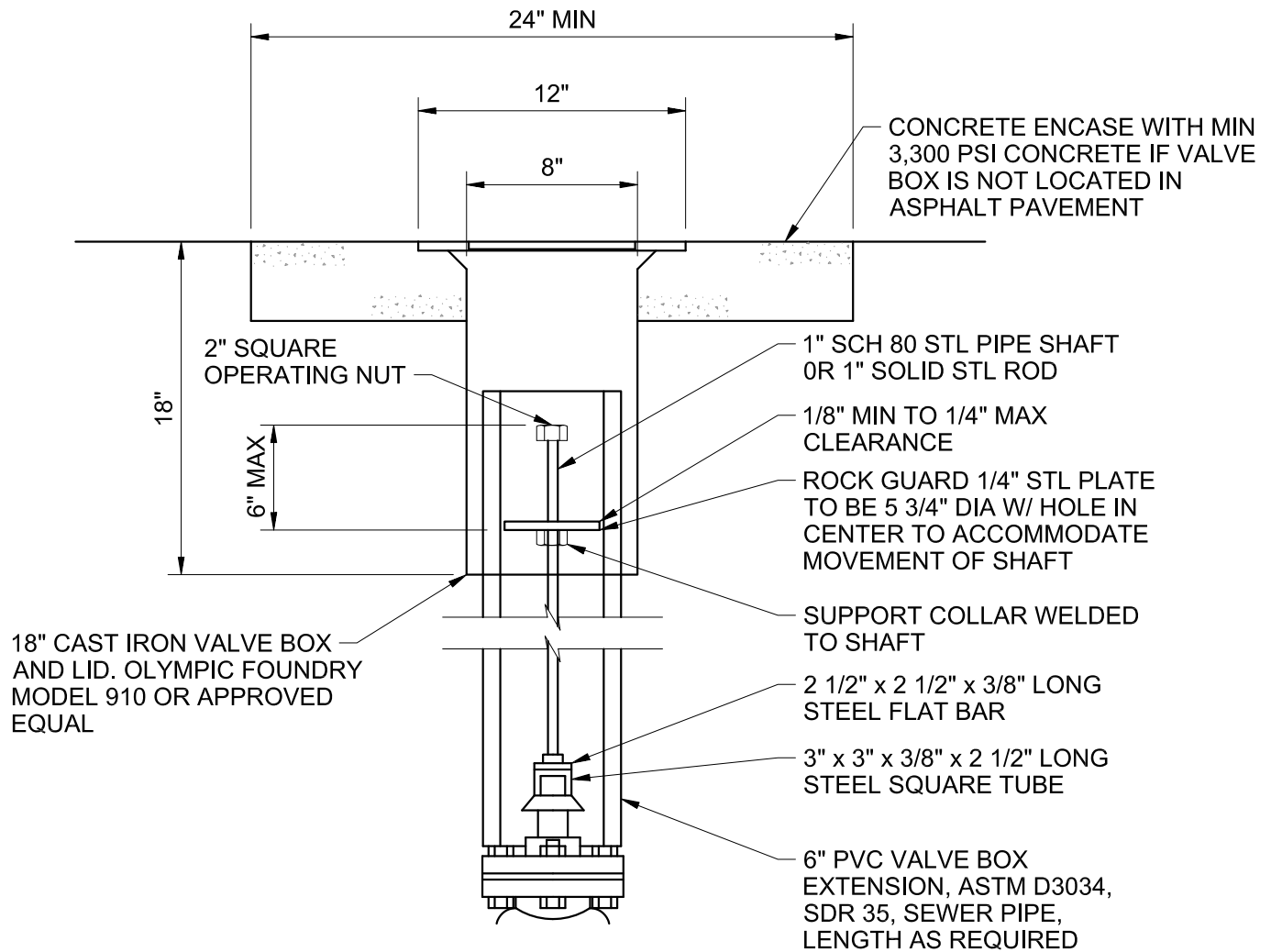
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STANDARD DRAWING TITLE

BUTTERFLY VALVE AND VALVE BOX ASSEMBLY

NO SCALE
DIVISION
WATER
DRAWING NO.
410



NOTES:

1. EXTEND 2" SQUARE OPERATING NUT TO WITHIN 18" OF FINISH GRADE WHEN VALVE OPERATING NUT IS DEEPER THAN 3' FROM FINISH GRADE.
2. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE OPERATING NUT AND ADJUSTED TO MEET FINISH GRADE.
3. VALVE BOX EXTENSION SHALL BE A CONTINUOUS PVC PIPE WITH NO BELLS OR COUPLERS.



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**VALVE
OPERATING NUT
EXTENSION**

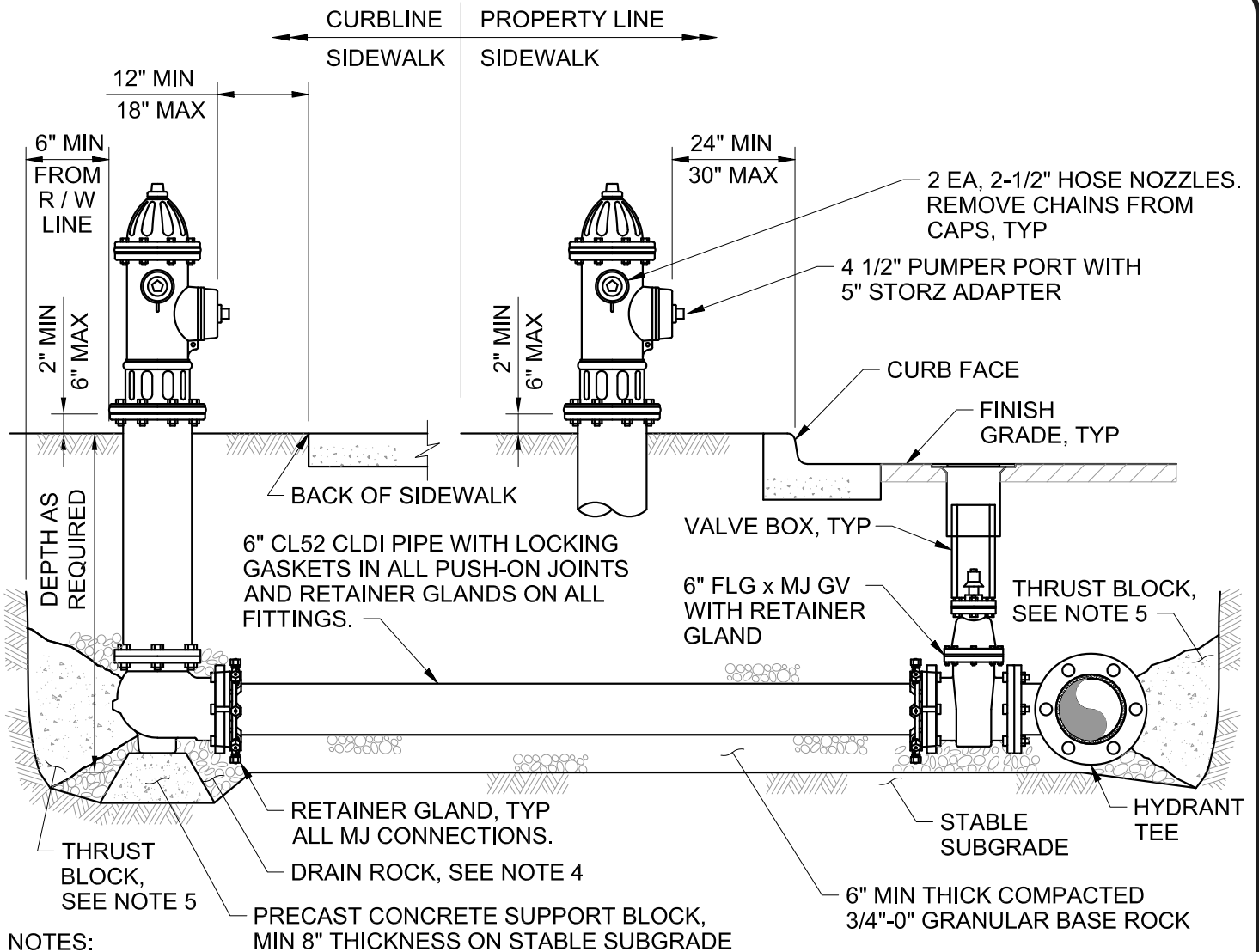
NO SCALE

DIVISION

WATER


DRAWING NO.

412



NOTES:

1. FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD C502 DRY-BARREL FIRE HYDRANTS, WITH COMPRESSION TYPE MAIN VALVE AND TRAFFIC FLANGE, AND SHALL BE KENNEDY K-81D GUARDIAN OR WATEROUS 5-1/4 PACER, WITH "SAFETY YELLOW" EPOXY COATING BY THE MANUFACTURER. FIRE HYDRANTS SHALL BE SET PLUMB IN ALL DIRECTIONS WITH PUMPER PORT FACING DIRECTION OF ACCESS.
2. VERTICAL EXTENSIONS REQUIRED FOR HYDRANTS SET TOO LOW WILL NOT BE ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER. WHERE APPROVED, SUCH EXTENSIONS SHALL BE PROVIDED BY THE CONTRACTOR AND INSTALLED TO THE MANUFACTURER'S SPECIFICATIONS.
3. FIRE HYDRANTS SHALL BE LOCATED TO ALLOW A MINIMUM OF 5-FEET CLEAR SPACE SURROUNDING ALL PORTIONS OF THE HYDRANT. THERE SHALL BE NO OBSTRUCTIONS DIRECTLY IN LINE WITH ANY OF THE PORTS OF THE HYDRANT FOR A DISTANCE OF 6-FEET. FIRE HYDRANTS SHALL NOT BE LOCATED WITHIN SIDEWALKS OR OTHER WALKWAYS WITHOUT PRIOR CITY ENGINEER AND FIRE CODE OFFICIAL APPROVAL.
4. MINIMUM 4 CUBIC FEET OF 1-1/2" CLEAN DRAIN ROCK SHALL BE PLACED AROUND HYDRANT SHOE UP TO 6" MINIMUM ABOVE THE HYDRANT DRAIN OUTLETS.
5. THRUST BLOCKING WHERE REQUIRED AND AS DIRECTED BY CITY ENGINEER SHALL BE PER STANDARD DRAWING 402. PIPE AND FITTINGS IN CONTACT WITH CONCRETE SHALL BE WRAPPED WITH 8 MIL PLASTIC PRIOR TO CONCRETE PLACEMENT. CONCRETE SHALL NOT BLOCK HYDRANT DRAIN OUTLETS.



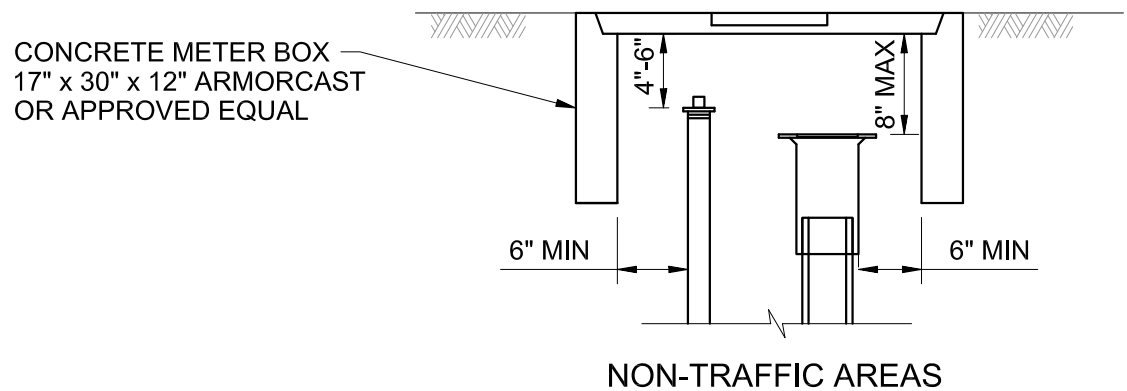
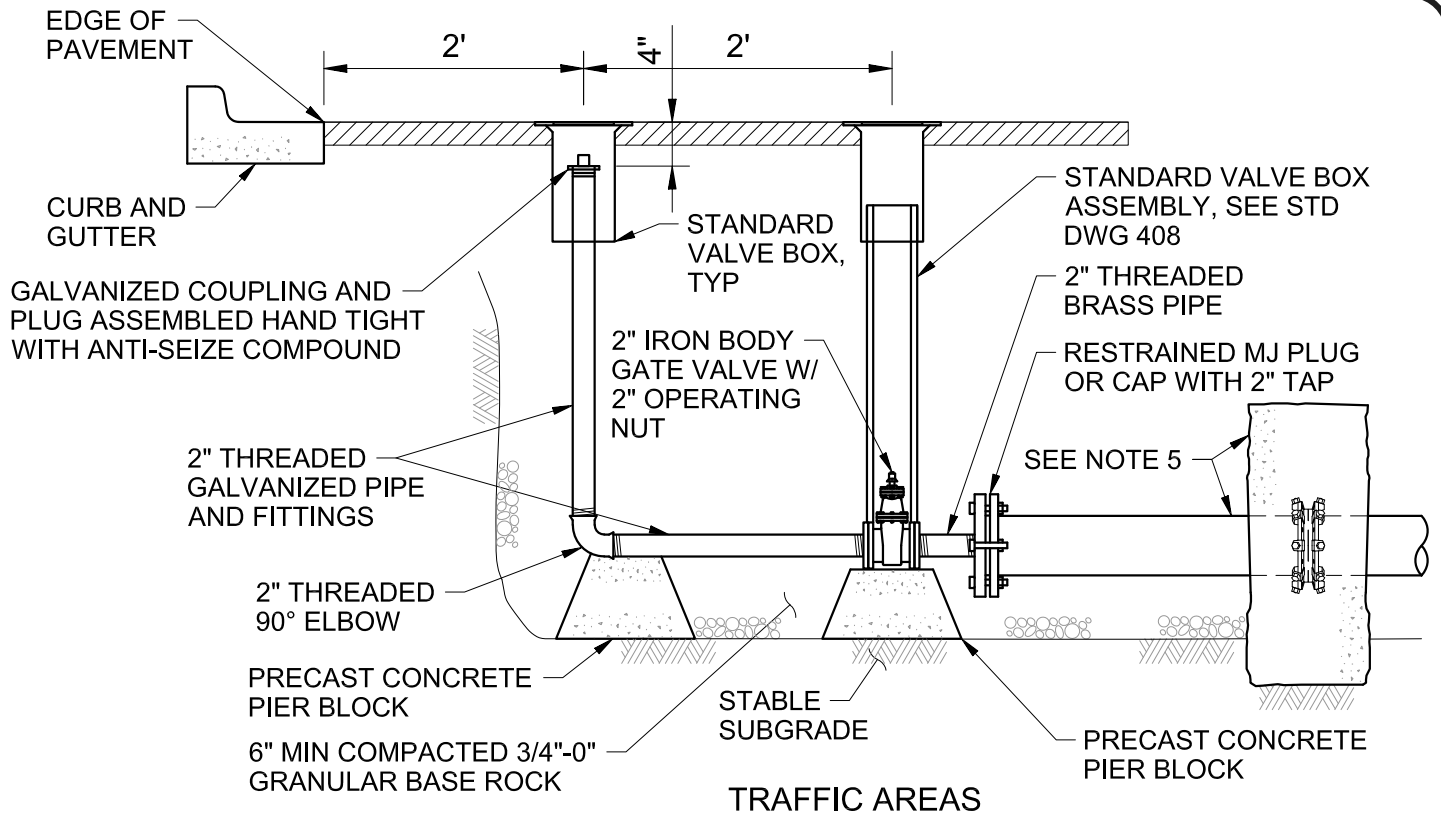
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STANDARD DRAWING TITLE


STANDARD FIRE HYDRANT ASSEMBLY

NO SCALE
DIVISION
WATER
DRAWING NO.
414



NOTES:

1. BLOW-OFF SIZE MUST BE IN ACCORDANCE WITH AWWA FLUSHING FLOW RATES, BUT NOT LESS THAN 2" FOR 8" AND SMALLER WATERLINES. FOR 10" AND LARGER WATERLINES, USE FIRE HYDRANT OR BLOW-OFF ASSEMBLY APPROVED BY THE CITY ENGINEER.
2. BLOW-OFF SHALL NOT BE LOCATED IN CURB AND GUTTERS OR IN SWALES/DITCHES.
3. THREADED CONNECTIONS SHALL BE ASSEMBLED USING COMPOUNDS APPROVED FOR USE IN POTABLE WATER SYSTEMS. ALL PIPING MATERIALS SHALL BE NSF 61 CERTIFIED.
4. IN AREAS EXPOSED TO TRAFFIC, INSTALL STANDARD VALVE BOX ASSEMBLIES ADJUSTED TO FINISH GRADE. IN NON-TRAFFIC AREAS, INSTALL STANDARD VALVE BOX OVER THE VALVE ONLY AND COVER THE VALVE BOX AND BLOW-OFF PIPE WITH AN ARMORCAST METER BOX WITH A CAST IRON COVER.
5. RUNS OF PIPE WITH BLOW-OFF ASSEMBLIES SHALL BE MECHANICALLY RESTRAINED WITH LOCKING PUSH-ON GASKETS AND RETAINER GLANDS ON ALL FITTINGS, AND RESTRAINED WITH STRADDLE BLOCK.



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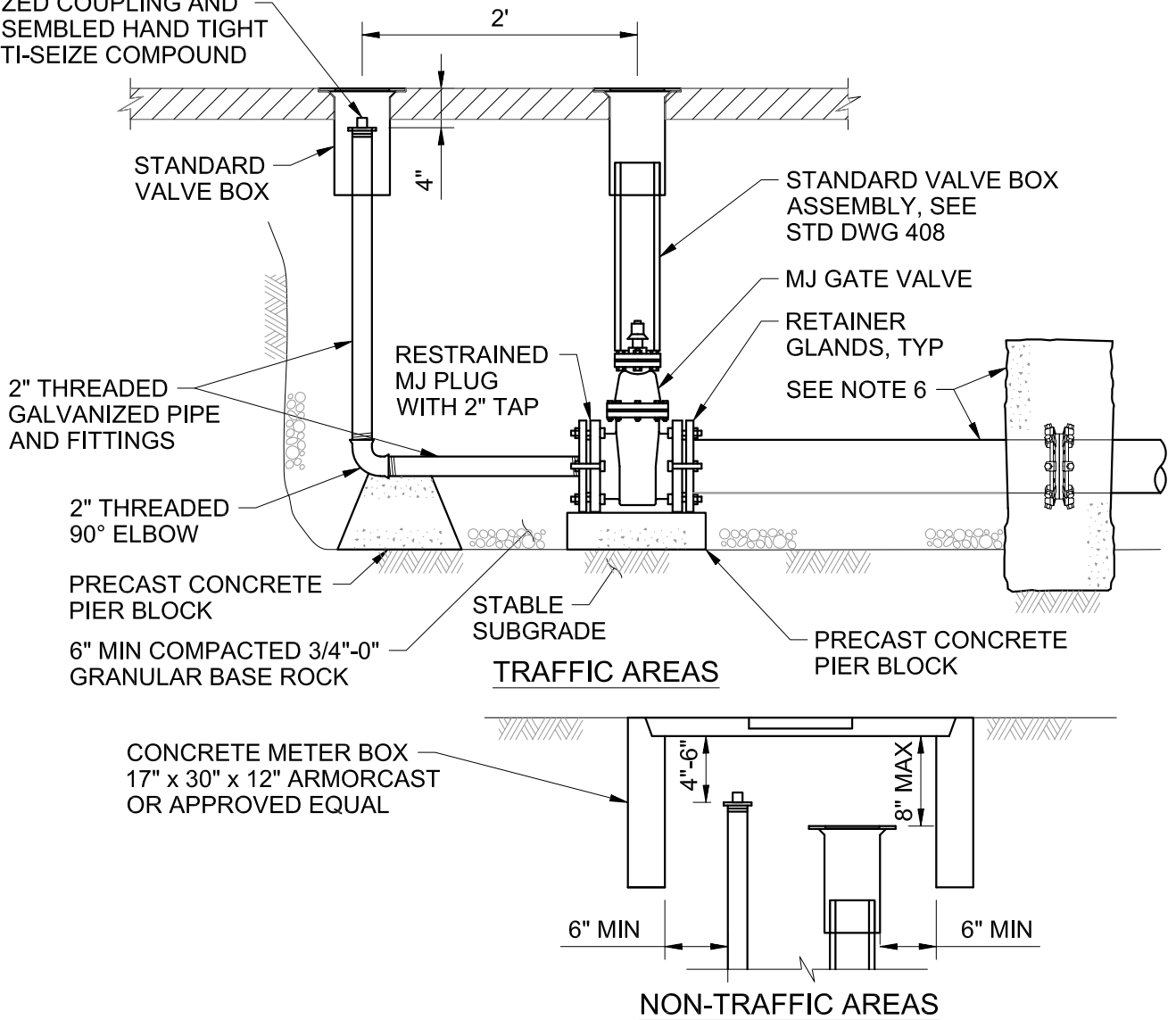
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STANDARD DRAWING TITLE

STANDARD 2" BLOW-OFF ASSEMBLY (DEAD-END MAIN)


NO SCALE
DIVISION
WATER
DRAWING NO.
416

GALVANIZED COUPLING AND
PLUG ASSEMBLED HAND TIGHT
WITH ANTI-SEIZE COMPOUND



NOTES:

1. BLOW-OFF IS TO BE USED WHEN REQUIRED BY THE CITY ENGINEER, AT THE ENDS OF WATERLINES THAT MAY BE EXTENDED IN THE FUTURE.
2. BLOW-OFF SIZE MUST BE IN ACCORDANCE WITH AWWA FLUSHING FLOW RATES, BUT NOT LESS THAN 2" FOR 8" AND SMALLER WATERLINES. FOR 10" AND LARGER WATERLINES, USE FIRE HYDRANT OR BLOW-OFF ASSEMBLY APPROVED BY THE CITY ENGINEER.
3. BLOW-OFF SHALL NOT BE LOCATED IN CURB AND GUTTERS OR IN SWALES/DITCHES.
4. THREADED CONNECTIONS SHALL BE ASSEMBLED USING COMPOUNDS APPROVED FOR USE IN POTABLE WATER SYSTEMS. ALL PIPING MATERIALS SHALL BE NSF 61 CERTIFIED.
5. IN AREAS EXPOSED TO TRAFFIC, INSTALL STANDARD VALVE BOX ASSEMBLIES ADJUSTED TO FINISH GRADE. IN NON-TRAFFIC AREAS, INSTALL STANDARD VALVE BOX OVER THE VALVE ONLY AND COVER THE VALVE BOX AND BLOW-OFF PIPE WITH AN ARMORCAST METER BOX WITH A CAST IRON COVER.
6. RUNS OF PIPE WITH BLOW-OFF ASSEMBLIES SHALL BE MECHANICALLY RESTRAINED WITH LOCKING PUSH-ON GASKETS AND RETAINER GLANDS ON ALL FITTINGS, AND RESTRAINED WITH STRADDLE BLOCK.



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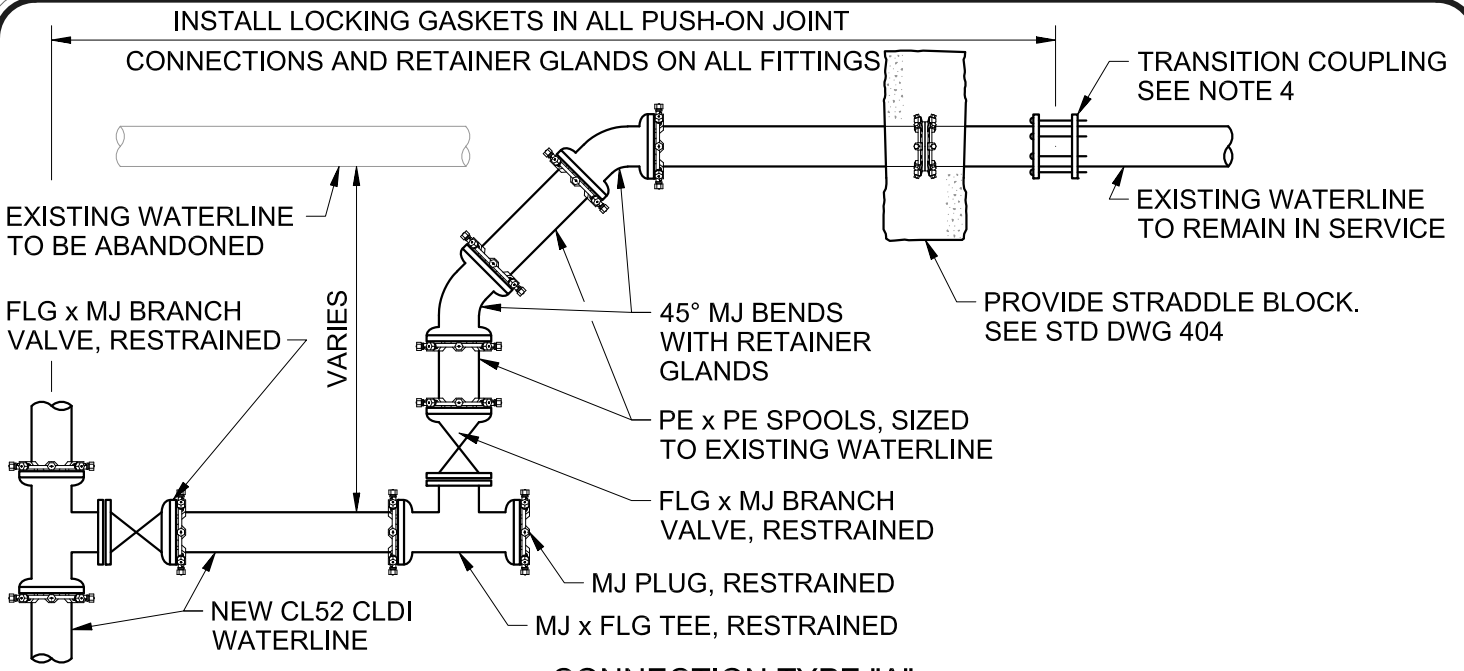
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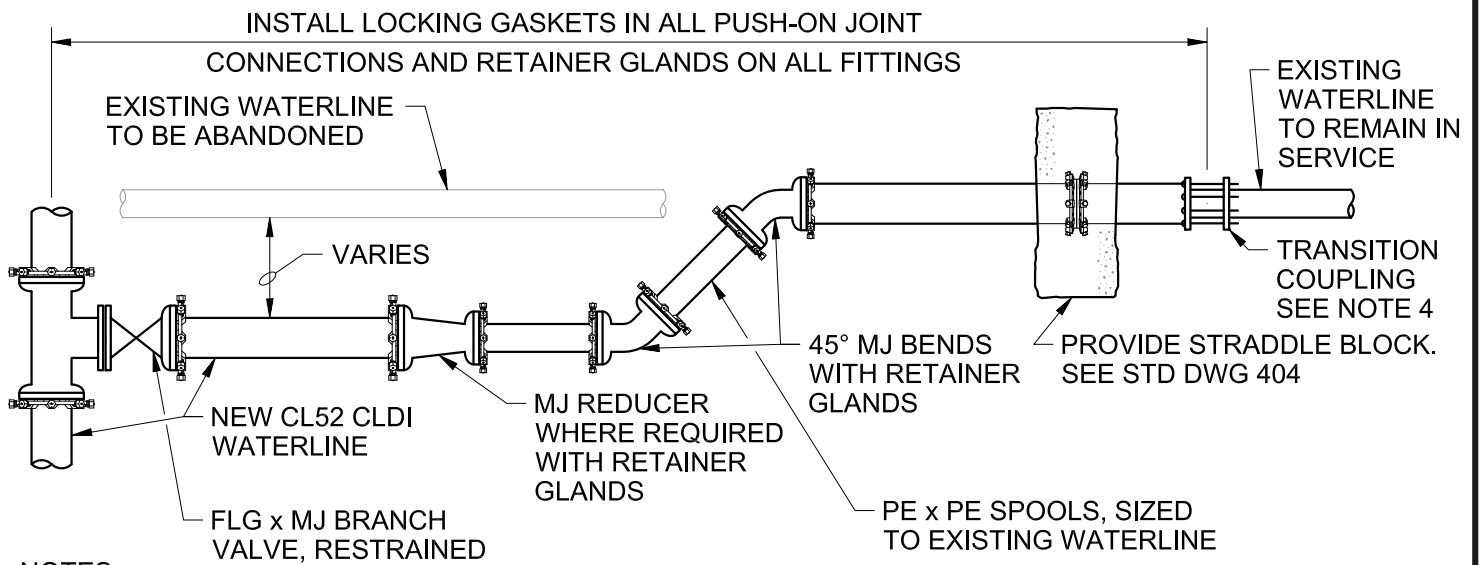
STANDARD DRAWING TITLE

STANDARD 2" BLOW-OFF FOR FUTURE EXTENSION

NO SCALE
DIVISION
WATER
DRAWING NO.
418




CONNECTION TYPE "A"



CONNECTION TYPE "B"

NOTES:

1. UNLESS SHOWN OR SPECIFIED OTHERWISE, THE CITY ENGINEER WILL DETERMINE WHICH CONNECTION TYPE IS APPROPRIATE FOR A GIVEN SITUATION.
2. CONNECTION TYPE "A" IS GENERALLY FOR SITUATIONS WHERE THE NEW WATERLINE WILL ULTIMATELY BE EXTENDED TO REPLACE THE EXISTING WATERLINE.
3. CONNECTION TYPE "B" IS GENERALLY FOR SITUATIONS WHERE THE NEW WATERLINE IS EXPECTED TO REMAIN IN SERVICE FOR THE FORESEEABLE FUTURE.
4. WHEN THE EXISTING WATERLINE IS AWWA C900 PVC OR DUCTILE IRON, USE A DUCTILE IRON SOLID SLEEVE COUPLING TO MAKE CONNECTION TO EXISTING WATERLINE.
5. DISINFECTION SHALL COMPLY WITH THE CITY AND OREGON HEALTH AUTHORITY REQUIREMENTS. CONNECTION ASSEMBLY COMPONENTS NOT SUBJECTED TO PRESSURE TESTING WITH THE NEW WATERLINE WILL BE VISUALLY CHECKED FOR LEAKS AT LINE PRESSURE. VERIFICATION OF RESTRAINT REQUIREMENTS AND VISUAL INSPECTIONS WILL BE PERFORMED BY PUBLIC WORKS.

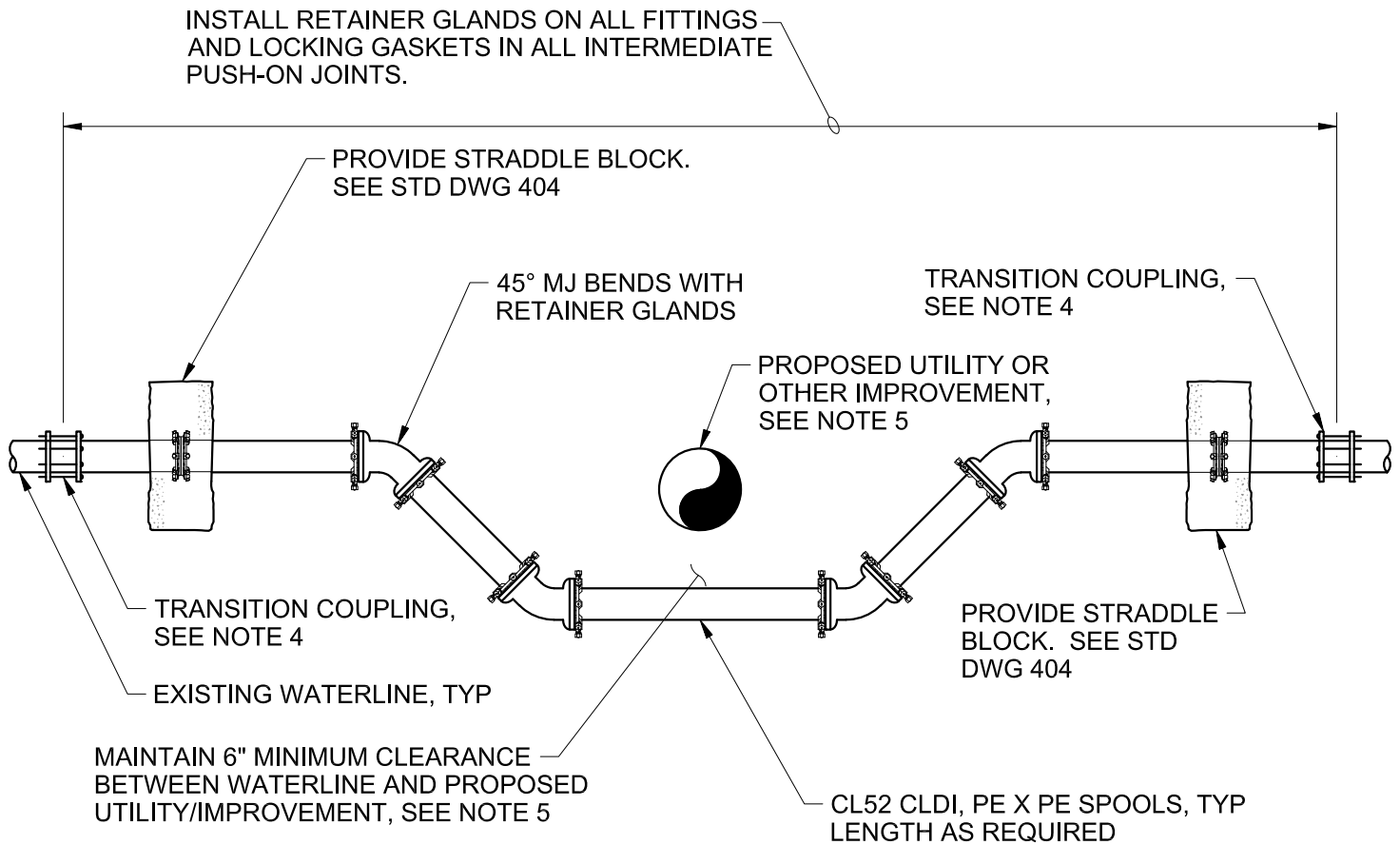


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STANDARD DRAWING TITLE
STANDARD CONNECTION ASSEMBLIES

NO SCALE
DIVISION
WATER
DRAWING NO.
420



NOTES:

1. THIS DETAIL APPLIES TO SITUATIONS WHERE AN EXISTING WATERLINE NEEDS TO BE RELOCATED UNDER A PROPOSED IMPROVEMENT. THE NEED FOR ADDITIONAL REQUIREMENTS, SUCH AS VALVES, BLOW-OFF ASSEMBLIES, ETC., WILL BE DETERMINED BY THE CITY ENGINEER.
2. ALL NEW PIPING MATERIALS SHALL BE NSF 61 CERTIFIED AND SHALL BE CLEANED AND DISINFECTED IN ACCORDANCE WITH THE CITY AND OREGON HEALTH AUTHORITY REQUIREMENTS.
3. NEW PIPING INSTALLED IN EXISTING WATERLINES WILL BE VISUALLY CHECKED FOR LEAKS AT LINE PRESSURE. VERIFICATION OF RESTRAINT REQUIREMENTS AND VISUAL INSPECTIONS WILL BE PERFORMED BY PUBLIC WORKS.
4. WHEN THE EXISTING WATERLINE IS AWWA C900 PVC OR DUCTILE IRON, USE A DUCTILE IRON SOLID SLEEVE COUPLING TO MAKE CONNECTION TO EXISTING WATERLINE.
5. WHERE SANITARY SEWER LINES CROSS ABOVE OR WITHIN 18-INCHES VERTICAL SEPARATION BELOW A WATERLINE, SEWER MAINS AND/OR LATERALS SHALL BE REPLACED WITH AWWA C900 (MIN DR18) PVC OR WITH CL52 CLDI AT THE CROSSING IN ACCORDANCE WITH OREGON ADMINISTRATIVE RULES CHAPTER 333-061-0050, CONSTRUCTION STANDARDS. CENTER ONE FULL LENGTH OF PIPE AT POINT OF CROSSING AND CONNECT TO EXISTING SEWER LINES WITH APPROVED WATERTIGHT FITTINGS OR COUPLINGS.



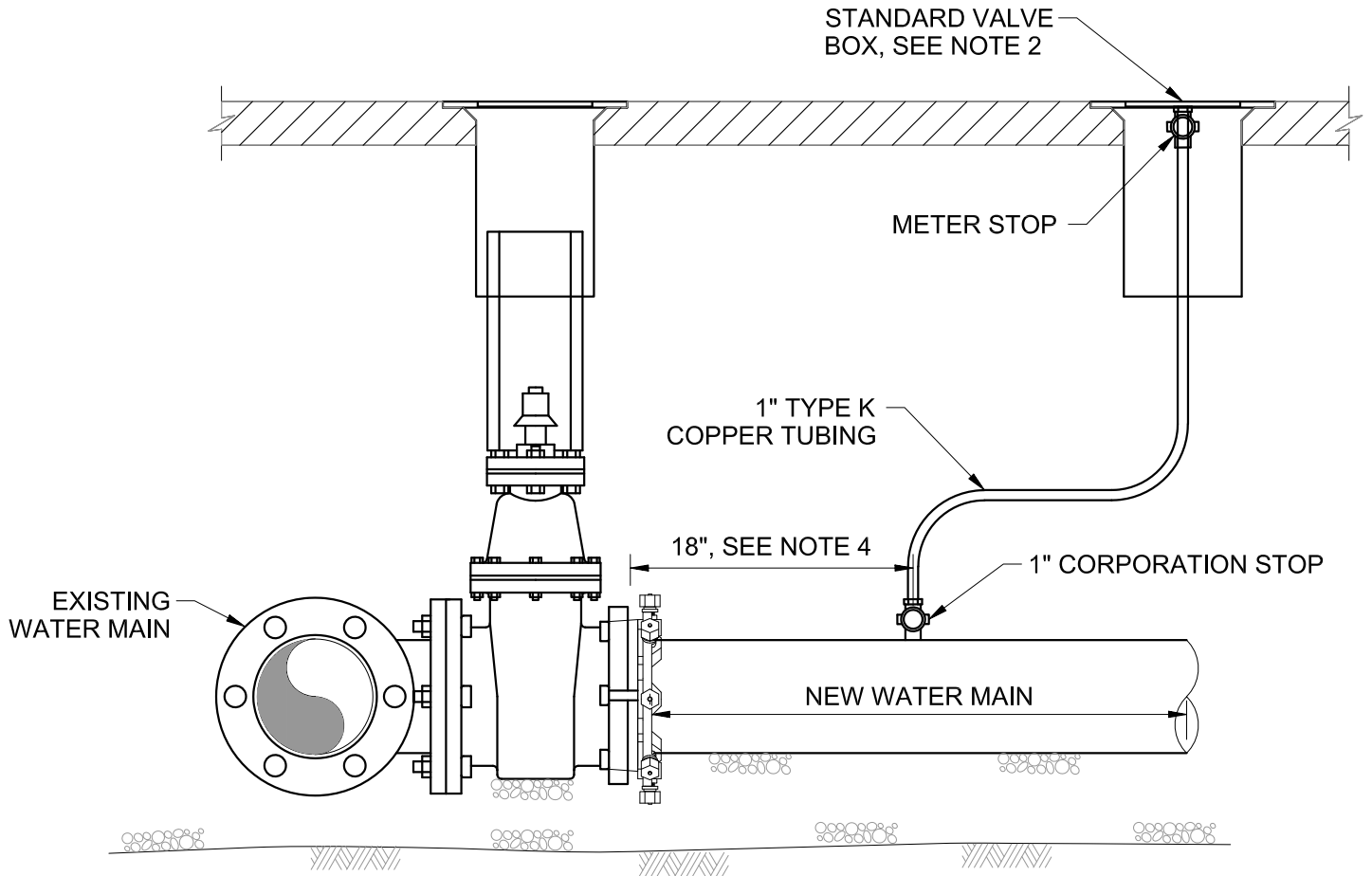
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STANDARD DRAWING TITLE

TYPICAL WATERLINE UNDERCROSSING

NO SCALE
DIVISION
WATER
DRAWING NO.
422



NOTES:

1. CHLORINATION PROCESS TO BE CONDUCTED BY CONTRACTOR IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS AND OBSERVED BY THE CITY.
2. THE STANDARD VALVE BOX LOCATED OVER THE 1" CHLORINE LINE IS NOT REQUIRED TO BE INSTALLED IF CHLORINE LINE IS LOCATED BEHIND THE CURB IN THE PLANTER STRIP. THE VALVE BOX IS TO BE INSTALLED ONLY WHEN THE CHLORINE LINE IS LOCATED IN TRAFFIC AREAS.
3. CHLORINE LINE PLACED IN NON-TRAFFIC AREAS SHALL BE LOCATED 6" ABOVE FINISH GRADE AND SHALL BE MARKED WITH BRIGHT ORANGE FLAGGING OR RIBBON MATERIAL.
4. DISTANCE FROM THE GATE VALVE TO THE CHLORINE TAP SHALL BE 18" AS SHOWN. SEE STANDARD DRAWING 430 FOR TAP REQUIREMENTS.
5. TEMPORARY ASPHALT SURFACING WILL BE REQUIRED IN TRAFFIC AREAS.
6. CONTRACTOR TO REMOVE CHLORINATION ASSEMBLY AFTER RECEIVING NOTICE OF NEGATIVE BACTERIOLOGICAL TEST AND AFTER APPROVAL FROM THE CITY ENGINEER. CORP STOP SHALL BE REMOVED AND REPLACED WITH AN AWWA THREADED BRASS PLUG.



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**TEMPORARY MAIN
LINE CHLORINATION
ASSEMBLY**

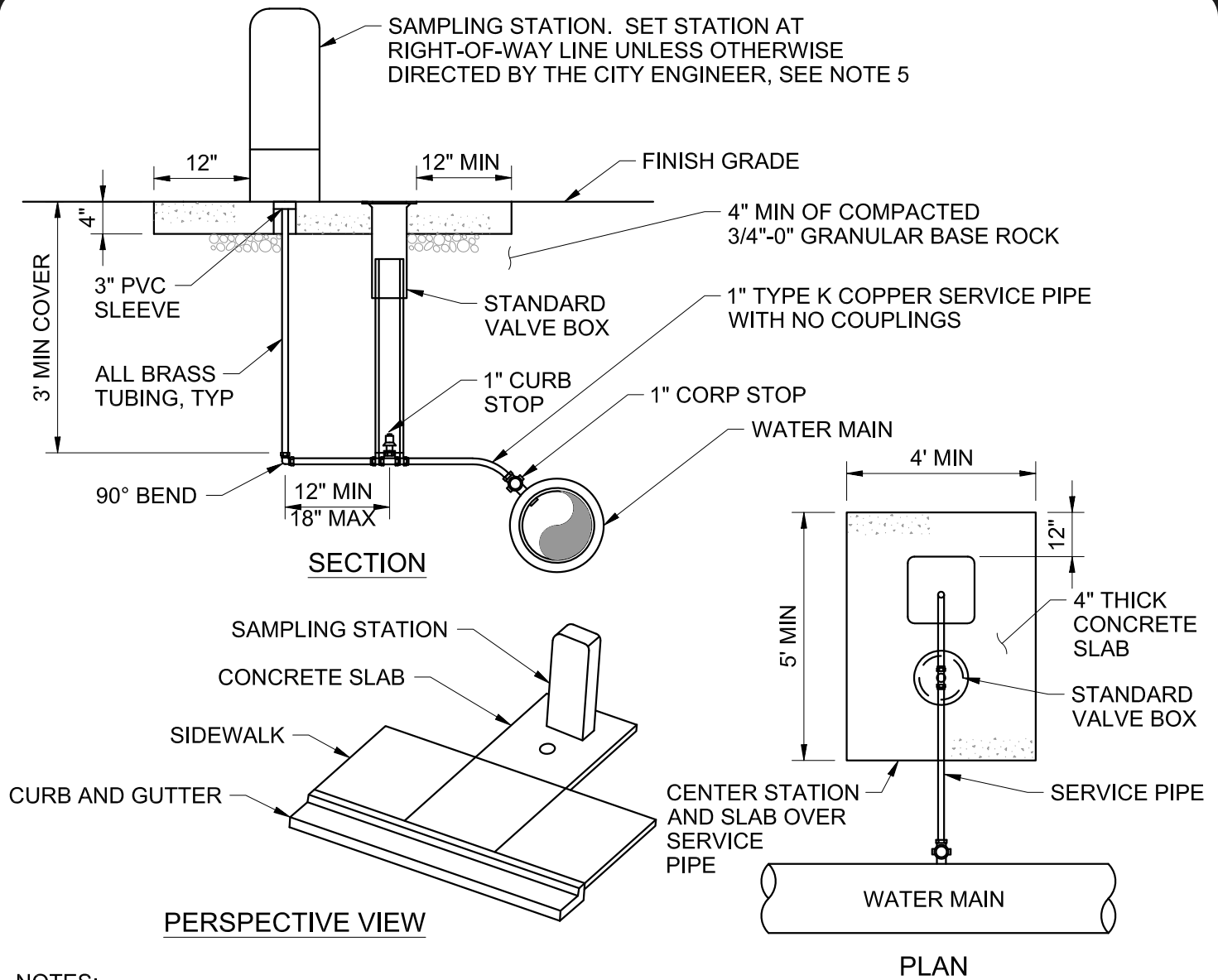
NO SCALE

DIVISION

WATER


DRAWING NO.

424



NOTES:

1. ALL MATERIALS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. SAMPLING STATION SHALL BE ECLIPSE NO. 88 SAMPLING STATION WITH THREADED OUTLET NOZZLE AND BRASS INTERIOR, STAND PIPE GALVANIZED EXTERIOR OR APPROVED EQUAL.
2. DOUBLE STRAP DUCTILE IRON SADDLES SHALL BE INSTALLED ON 4" DUCTILE IRON PIPE AND ALL SIZES OF CAST IRON AND STEEL PIPE. ALL DUCTILE IRON APPLICATIONS OVER 4" DIA SHALL BE DIRECT TAPPED FOR 1" SERVICE. STAINLESS STEEL SADDLES WITH STAINLESS STRAPS SHALL BE INSTALLED ON ASBESTOS CEMENT PIPE.
3. CATHODIC PROTECTION WILL BE REQUIRED FOR NEW COPPER SERVICES WHEN CONNECTING TO EXISTING ASBESTOS-CEMENT WATER LINES. THE METHOD OF PROVIDING CATHODIC PROTECTION WILL REQUIRE THE APPROVAL OF THE CITY ENGINEER. WHEN CROSSING A CATHODICALLY PROTECTED SYSTEM, INSTALL WITHIN PVC SLEEVE.
4. CUTTING, REAMING, SIZE, AND BENDING OF COPPER TUBING SHALL BE PERFORMED USING TOOLS AND PRACTICES SPECIFIC TO THOSE OPERATIONS. ALL COPPER SERVICE PIPES SHALL BE DIRECT BURIED IN ROCK BACKFILL TO AVOID ANY COPPER CONTACT WITH NATIVE SOIL.
5. FINAL SAMPLING STATION LOCATION SHALL BE AS APPROVED AND DIRECTED BY THE CITY ENGINEER.



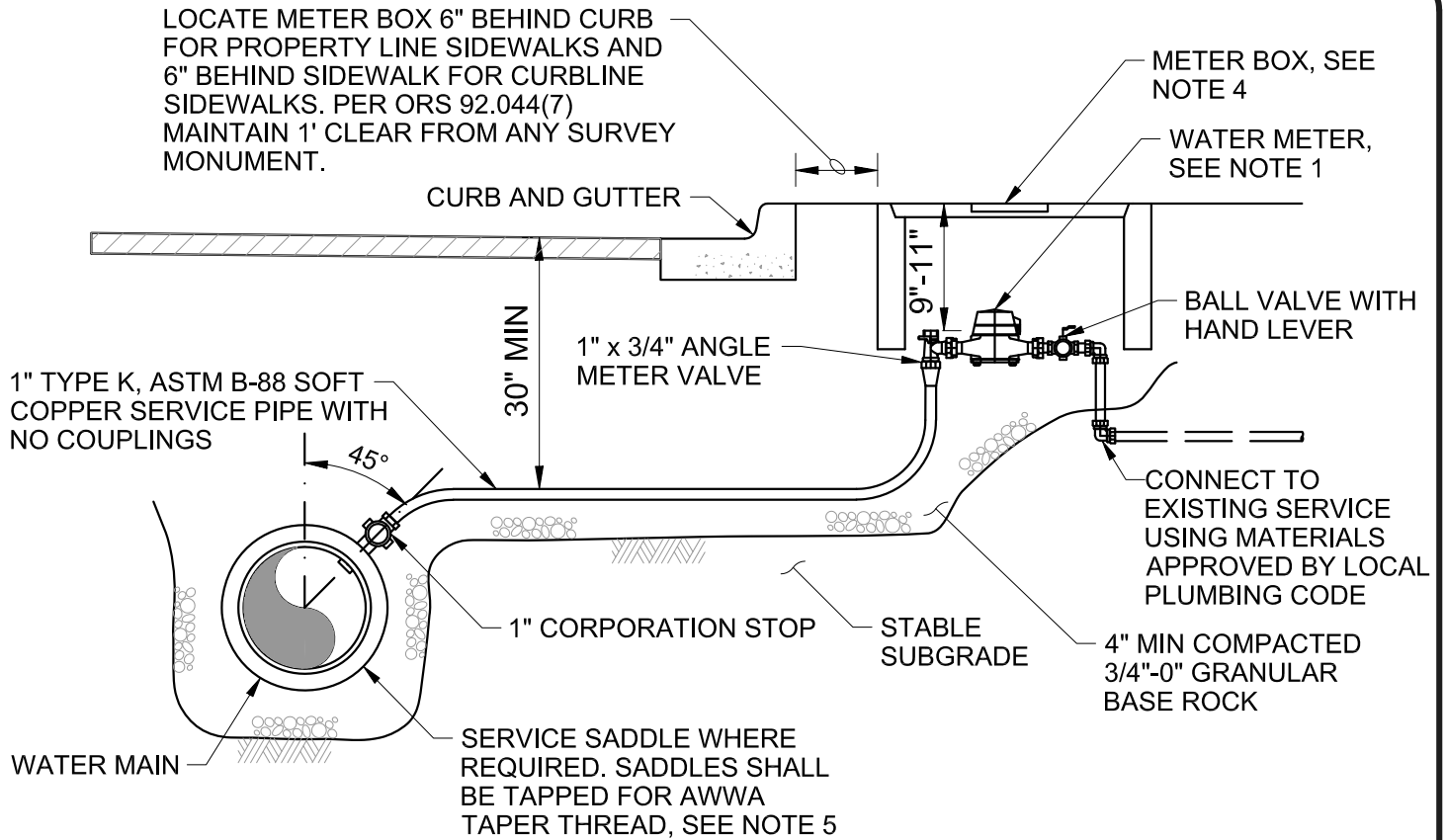
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STANDARD DRAWING TITLE

WATER SAMPLING STATION


NO SCALE
DIVISION
WATER
DRAWING NO.
426

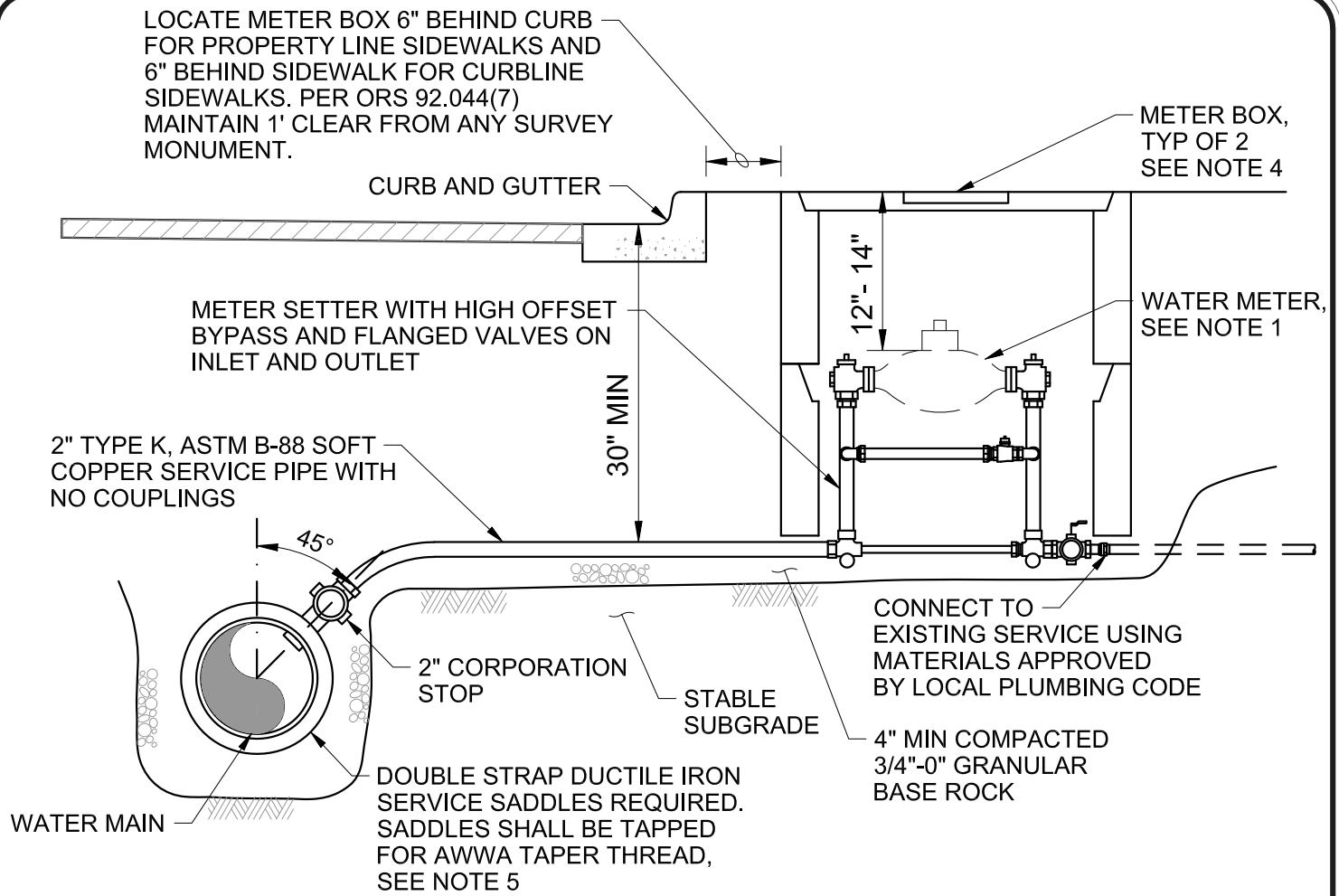


3/4" AND 1" METERS

NOTES:

1. WITH THE EXCEPTION OF THE WATER METER, ALL MATERIALS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. A CITY WATER METER PERMIT IS REQUIRED TO OBTAIN A WATER METER.
2. CORPORATION STOP, COPPER SERVICE LINE, AND WATER METER SHALL BE SIZED AS SPECIFIED.
3. THE METER SHALL BE SET PLUMB AND CENTERED EACH WAY INSIDE THE METER BOX.
4. METER BOX SHALL BE A 13" x 24" x 12" ARMORCAST POLYMER CONCRETE METER BOX. PROVIDE ALL METER BOXES WITH KNOCKOUTS FOR TOUCH-READ SENSORS.
5. DOUBLE STRAP DUCTILE IRON SADDLES SHALL BE INSTALLED ON 4" DUCTILE IRON PIPE AND ALL SIZES OF CAST IRON AND STEEL PIPE. ALL DUCTILE IRON APPLICATIONS OVER 4" DIA SHALL BE DIRECT TAPPED FOR 1" SERVICES. STAINLESS STEEL SADDLES WITH STAINLESS 4" STRAPS SHALL BE INSTALLED ON ASBESTOS CEMENT PIPE.
6. CATHODIC PROTECTION WILL BE REQUIRED FOR NEW COPPER SERVICES WHEN CONNECTING TO EXISTING ASBESTOS-CEMENT WATER LINES. THE METHOD OF PROVIDING CATHODIC PROTECTION WILL REQUIRE THE APPROVAL OF THE CITY ENGINEER.
7. CUTTING, REAMING, SIZE, AND BENDING OF COPPER TUBING SHALL BE PERFORMED USING TOOLS AND PRACTICES SPECIFIC TO THOSE OPERATIONS.
8. ALL COPPER SERVICE PIPES SHALL BE DIRECT BURIED IN GRANULAR BACKFILL TO AVOID ANY COPPER CONTACT WITH NATIVE SOIL. SERVICE LINES SHALL NOT BE INSTALLED BY JACKING OR BORING.


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	<p>REVISIONS</p>		



1-1/2" AND 2" METERS

NOTES:

1. WITH THE EXCEPTION OF THE WATER METER, ALL MATERIALS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
2. CORPORATION STOP, COPPER SERVICE LINE, AND WATER METER SETTER SHALL BE SIZED AS SPECIFIED.
3. THE METER SHALL BE SET PLUMB AND CENTERED EACH WAY INSIDE THE METER BOX.
4. METER BOX SHALL BE A 17" x 30" x 12" ARMORCAST POLYMER CONCRETE METER BOX. PROVIDE ALL METER BOXES WITH KNOCKOUTS FOR TOUCH-READ SENSORS.
5. DOUBLE STRAP DUCTILE IRON SADDLES SHALL BE INSTALLED ON 4" DUCTILE IRON PIPE AND ALL SIZES OF CAST IRON AND STEEL PIPE. STAINLESS STEEL SADDLES WITH STAINLESS STRAPS SHALL BE INSTALLED ON ASBESTOS CEMENT PIPE. SADDLES ARE REQUIRED FOR ALL 1-1/2" AND 2" TAPS.
6. CATHODIC PROTECTION WILL BE REQUIRED FOR NEW COPPER SERVICES WHEN CONNECTING TO EXISTING ASBESTOS-CEMENT WATER LINES. THE METHOD OF PROVIDING CATHODIC PROTECTION WILL REQUIRE THE APPROVAL OF THE CITY ENGINEER.
7. CUTTING, REAMING, SIZE, AND BENDING OF COPPER TUBING SHALL BE PERFORMED USING TOOLS AND PRACTICES SPECIFIC TO THOSE OPERATIONS.
8. ALL COPPER SERVICE PIPES SHALL BE DIRECT BURIED IN GRANULAR BACKFILL TO AVOID ANY COPPER CONTACT WITH NATIVE SOIL. SERVICE LINES SHALL NOT BE INSTALLED BY JACKING OR BORING.



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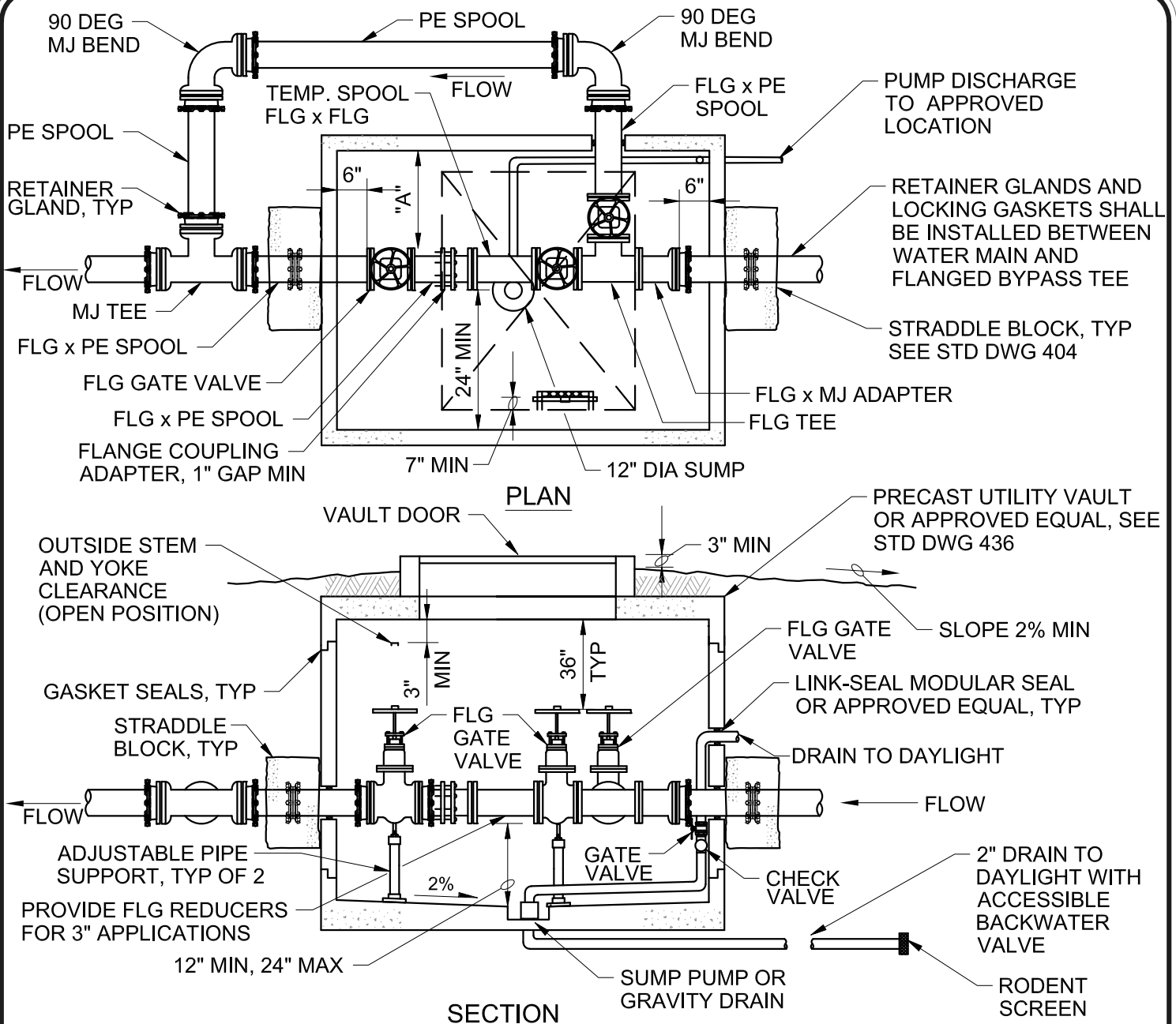
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STANDARD DRAWING TITLE


**1-1/2" AND 2"
WATER SERVICES**

NO SCALE
DIVISION
WATER
DRAWING NO.
432



*SEE STANDARD DRAWING 436 FOR METER VAULT NOTES AND ADDITIONAL REQUIREMENTS.

SIZE	MODEL TYPE	TEMP SPOOL LENGTH	DIM "A" (MIN)	*VAULT MODEL NUMBER	MODEL TYPE	TEMP SPOOL LENGTH	DIM "A" (MIN)	*VAULT MODEL NUMBER	MODEL TYPE	TEMP SPOOL LENGTH	DIM "A" (MIN)	*VAULT MODEL NUMBER
3"	SRH COMPOUND	25"	18"	4484-LA	COMPACT FIRELINE	-	-	4484-LA	SENSUS W-350 DRS	20"	18"	4484-LA
4"	SRH COMPOUND	30"	18"	4484-LA	COMPACT FIRELINE	34"	18"	4484-LA	SENSUS W-1000 DRS	24"	18"	4484-LA
6"	SRH COMPOUND	34"	18"	4484-LA	COMPACT FIRELINE	46"	20"	612-LA	SENSUS W-2000 DRS	28"	18"	4484-LA
8"	SRH COMPOUND	-	-	-	COMPACT FIRELINE	54"	23"	612-LA	SENSUS W-3500 DRS	31"	18"	5106-WA
10"	SRH COMPOUND	-	-	-	COMPACT FIRELINE	69"	25"	612-LA	SENSUS W-5500 DRS	42"	18"	5106-WA



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STANDARD DRAWING TITLE

COMPOUND WATER METER VAULT

DETAIL 1 OF 2

NO SCALE

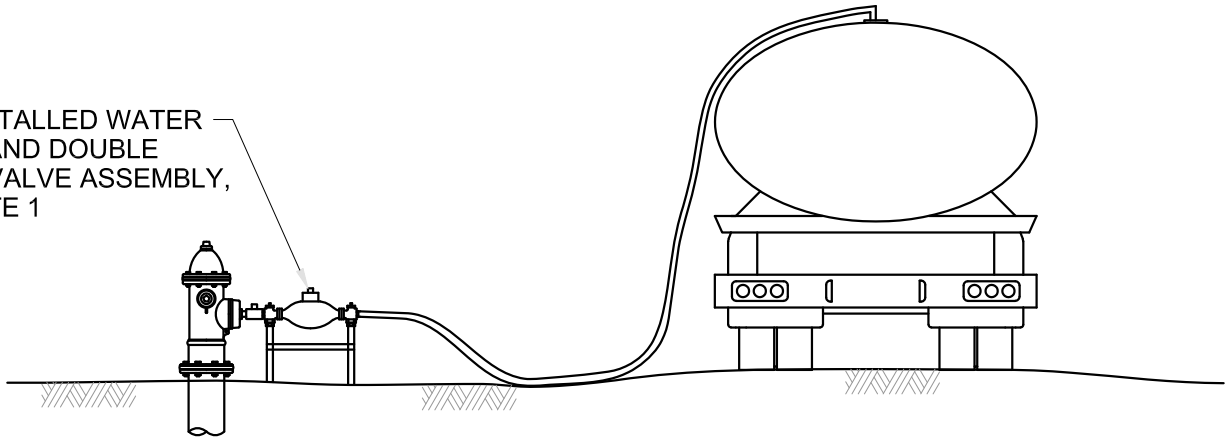
DIVISION

WATER

DRAWING NO.

434


CITY INSTALLED WATER METER AND DOUBLE CHECK VALVE ASSEMBLY, SEE NOTE 1



CITY INSTALLED PORTABLE BACKFLOW PREVENTION ASSEMBLY

NOTES:

1. CITY PERMIT WILL BE REQUIRED TO BE OBTAINED BY THE CONTRACTOR FOR CITY SUPPLIED WATER METER/DOUBLE CHECK VALVE ASSEMBLY. WATER METER/ DOUBLE CHECK VALVE ASSEMBLY WILL BE REQUIRED REGARDLESS OF TANK MOUNTED ASSEMBLIES AND WILL BE INSTALLED BY THE CITY.
2. ALL REQUIRED WATER SYSTEM BACKFLOW PROTECTION COMPONENTS AND CITY INSTALLATION COSTS INCURRED WILL BE AT THE CONTRACTOR'S EXPENSE.



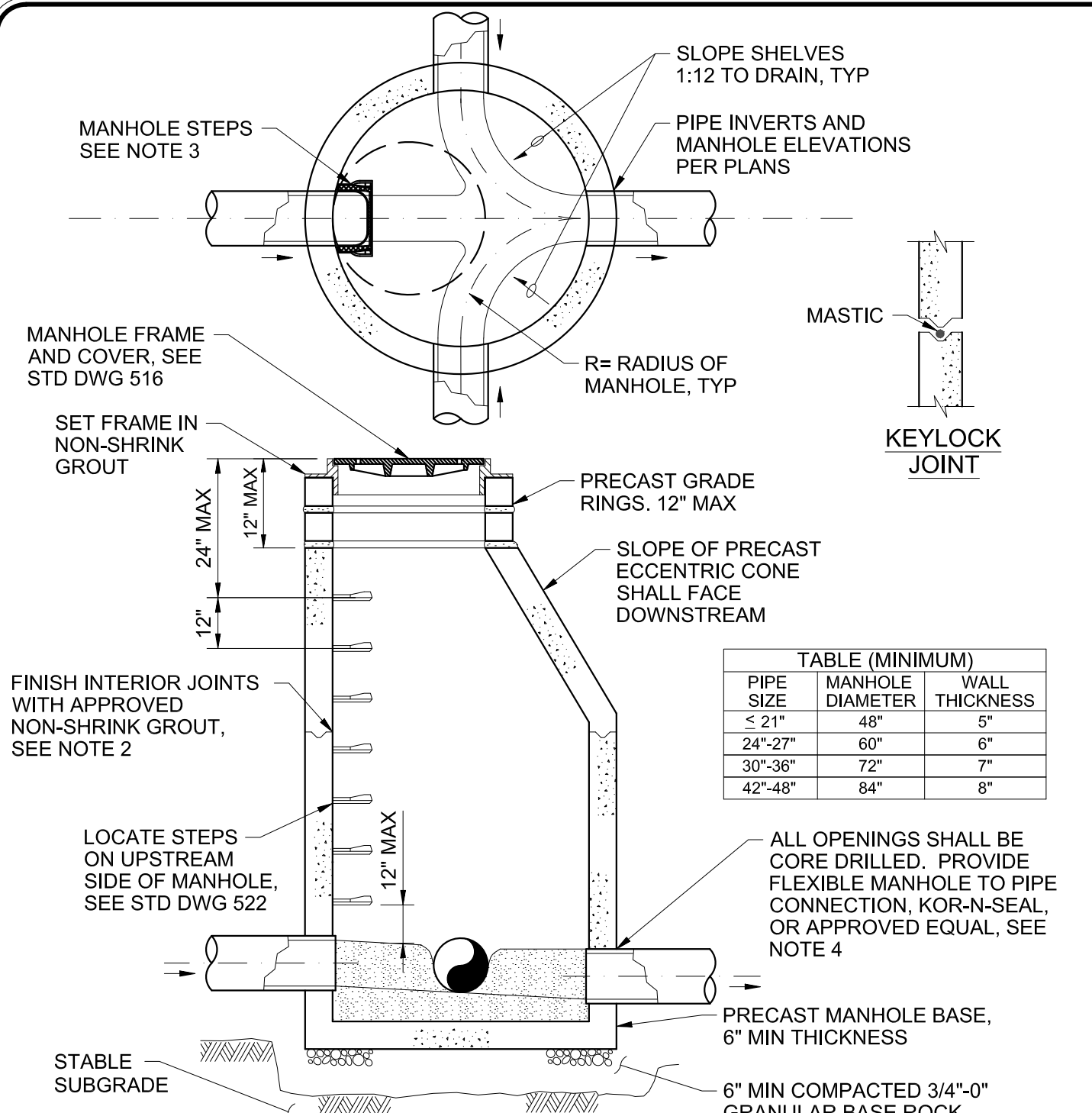
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STANDARD DRAWING TITLE


MINIMUM PROTECTION FOR FILLING TANKER TRUCK

NO SCALE
DIVISION
WATER
DRAWING NO.
438



NOTES:

1. CONCENTRIC CONES ARE NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER. ALL PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT CONFINED O-RING OR MASTIC JOINTS REQUIRED. NON-SHRINK GROUT INSIDE JOINTS AND WALL PENETRATIONS SMOOTH FOLLOWING MANHOLE ASSEMBLY.
3. STEPS TO BE FACTORY INSTALLED POLYPROPYLENE PLASTIC WITH 1/2" GRADE 60 REINFORCEMENT. SEE STANDARD DRAWING 524.
4. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, UNRESTRAINED JOINT WITHIN 18".



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STANDARD DRAWING TITLE

STANDARD MANHOLE

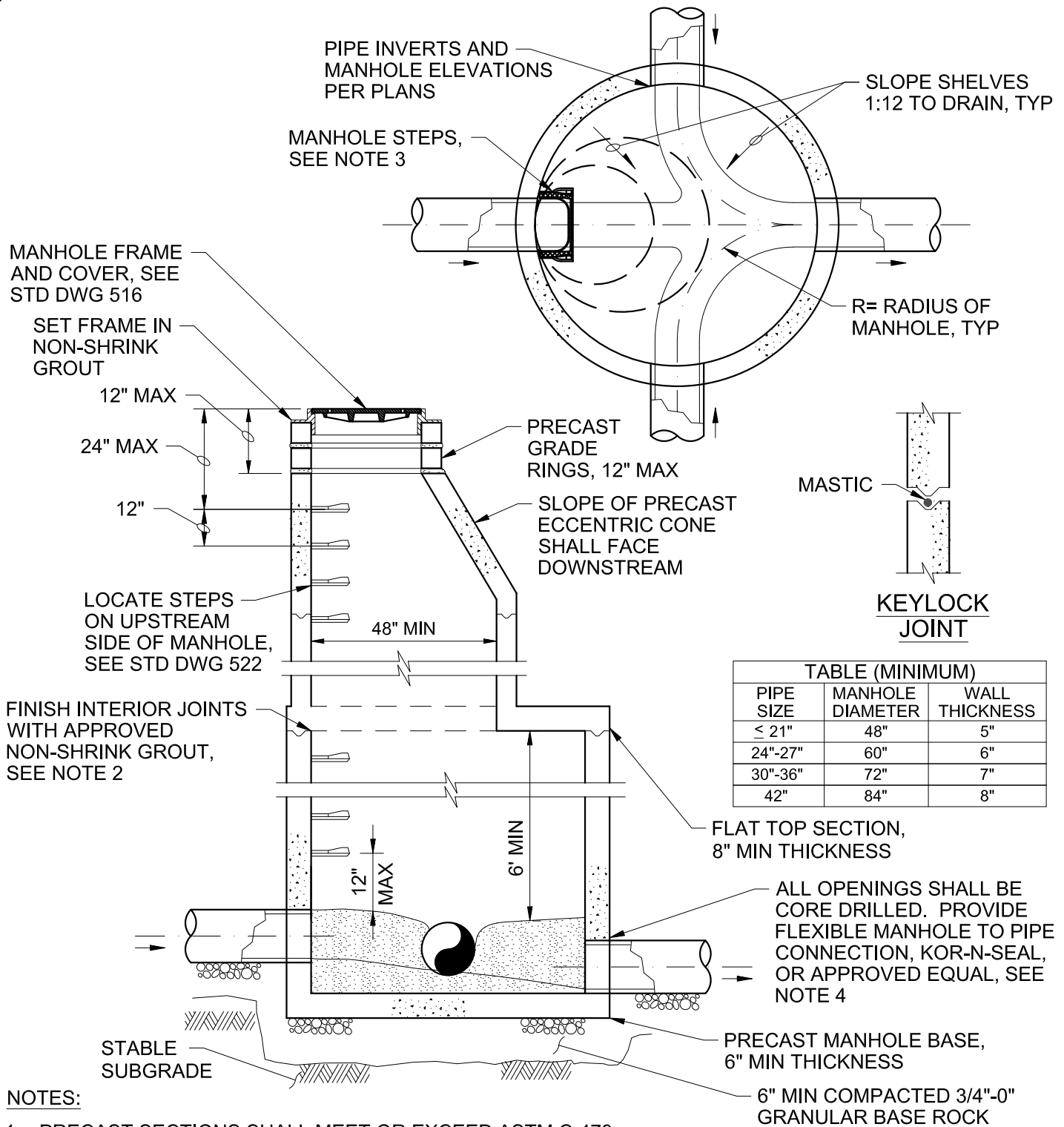
NO SCALE

DIVISION

SANITARY

DRAWING NO.

502



NOTES:

1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT CONFINED O-RING OR MASTIC JOINTS REQUIRED. NON-SHRINK GROUT INSIDE JOINTS AND WALL PENETRATIONS SMOOTH FOLLOWING MANHOLE ASSEMBLY.
3. STEPS TO BE FACTORY INSTALLED POLYPROPYLENE PLASTIC WITH 1/2" GRADE 60 REINFORCMENT ROD. SEE STANDARD DRAWING 524.
4. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, UNRESTRAINED JOINT WITHIN 18".



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STANDARD DRAWING TITLE

**STANDARD MANHOLE
FOR LARGE
DIAMETER PIPES**

NO SCALE

DIVISION

SANITARY

DRAWING NO.

504

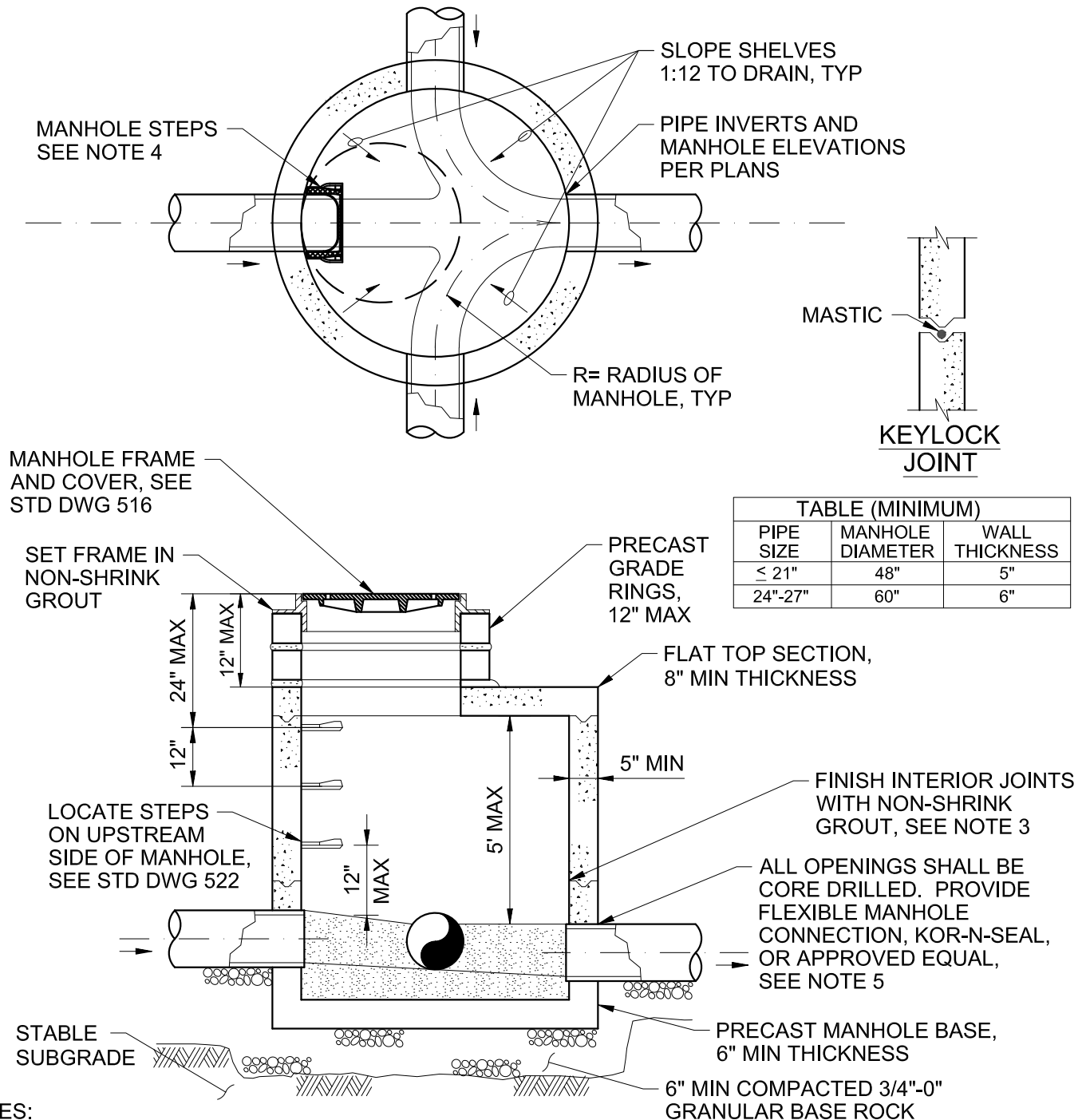



TABLE (MINIMUM)

PIPE SIZE	MANHOLE DIAMETER	WALL THICKNESS
≤ 21"	48"	5"
24"-27"	60"	6"

NOTES:

1. CONCENTRIC TOP SLABS ARE NOT PERMITTED UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
3. WATERTIGHT O-RING OR MASTIC JOINTS REQUIRED. NON-SHRINK GROUT INSIDE JOINTS AND WALL PENETRATIONS SMOOTH FOLLOWING MANHOLE ASSEMBLY.
4. STEPS TO BE FACTORY INSTALLED POLYPROPYLENE PLASTIC WITH 1/2" GRADE 60 REINFORCMENT. SEE STANDARD DRAWING 524.
5. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, UNRESTRAINED JOINT WITHIN 18".



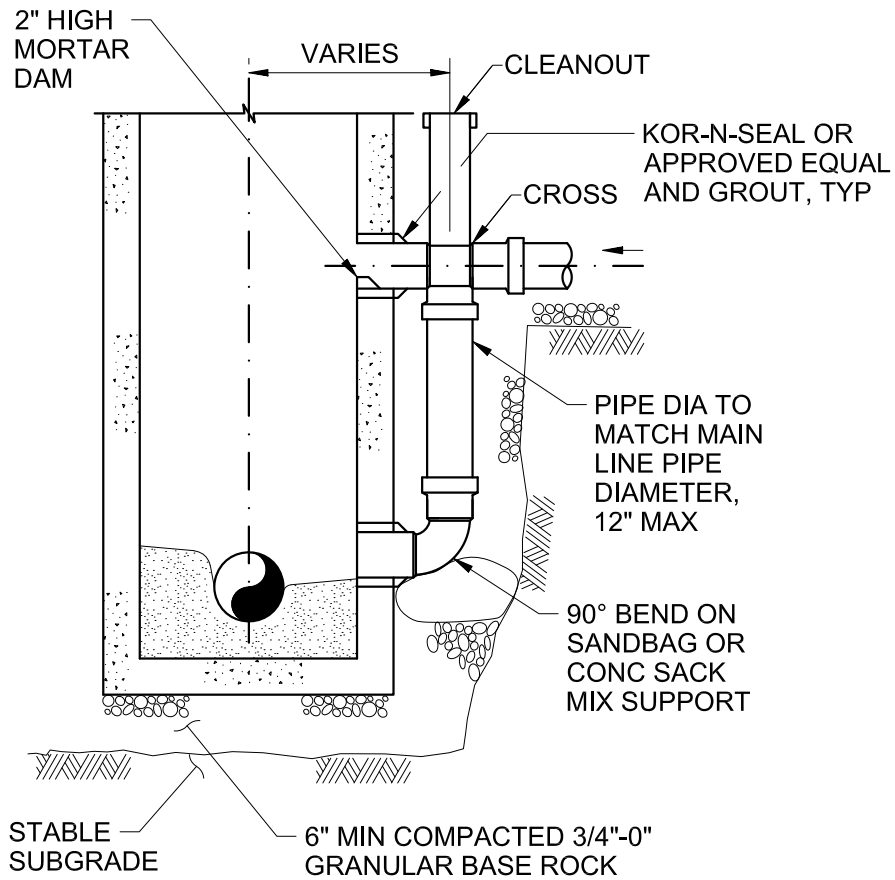
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STANDARD DRAWING TITLE

STANDARD SHALLOW FLAT TOP MANHOLE


NO SCALE
 DIVISION
 SANITARY
 DRAWING NO.
506



TEE

NOTES:

1. SEE STANDARD DRAWING 502, 504, AND 506 FOR ADDITIONAL REQUIREMENTS RELATIVE TO THE CONSTRUCTION OF PRECAST STANDARD AND FLAT-TOP MANHOLES.
2. DROP MANHOLES SHALL BE CONSTRUCTED WHERE THE DISTANCE BETWEEN PIPE INVERTS WILL EXCEED 24" IN SANITARY SEWER MANHOLES. PIPE INVERTS AND MANHOLE ELEVATIONS PER PLANS.
3. DROP ASSEMBLIES SHALL BE CONSTRUCTED OF PVC OR OTHER MATERIALS APPROVED FOR USE IN SANITARY SEWER SYSTEMS.
4. DROP ASSEMBLIES SHALL BE CONSTRUCTED ON THE OUTSIDE OF THE MANHOLE AS SHOWN. INSIDE DROP ASSEMBLIES ARE NOT PERMITTED WITHOUT THE APPROVAL OF THE CITY ENGINEER.
5. MAXIMUM SEWER MAIN SIZE SHALL BE 12-INCHES.
6. WYE DROP MAY BE REQUIRED OVER TEE DROP IN LOCATIONS OF HIGH FLOW OR STEEP GRADES.



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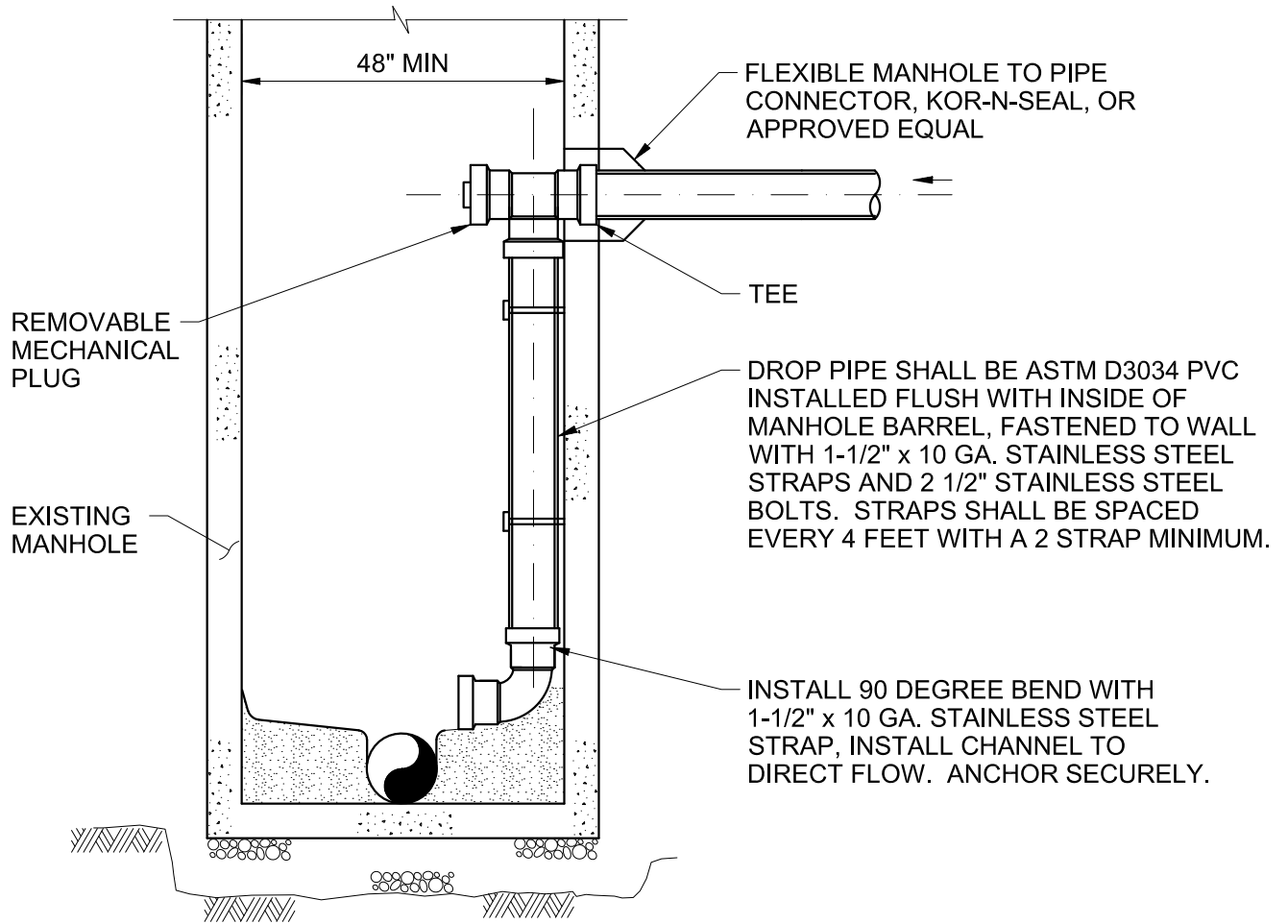
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STANDARD DRAWING TITLE

STANDARD OUTSIDE DROP MANHOLE

NO SCALE
DIVISION
SANITARY
DRAWING NO.
508



NOTES:

1. THE USE OF INSIDE DROP MANHOLES WILL REQUIRE APPROVAL OF THE CITY ENGINEER. THE USE OF INSIDE DROP MANHOLES WILL BE LIMITED TO ONLY SINGLE-FAMILY AND MULTI-FAMILY RESIDENCES FOR CONNECTIONS TO EXISTING DEEP SANITARY SEWER SYSTEMS. NOT APPLICABLE TO COMMERCIAL OR INDUSTRIAL APPLICATIONS.
2. ONLY ONE INSIDE DROP CONNECTION ALLOWED PER MANHOLE. PIPE INVERT ELEVATIONS SHALL BE AS SHOWN ON THE PLANS.
3. MINIMUM MANHOLE DIAMETER WITH INSIDE DROP CONNECTION SHALL BE 48-INCHES.
4. MAXIMUM DROP PIPE DIAMETER SHALL BE 6-INCHES.



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STANDARD DRAWING TITLE

**STANDARD INSIDE
DROP MANHOLE**

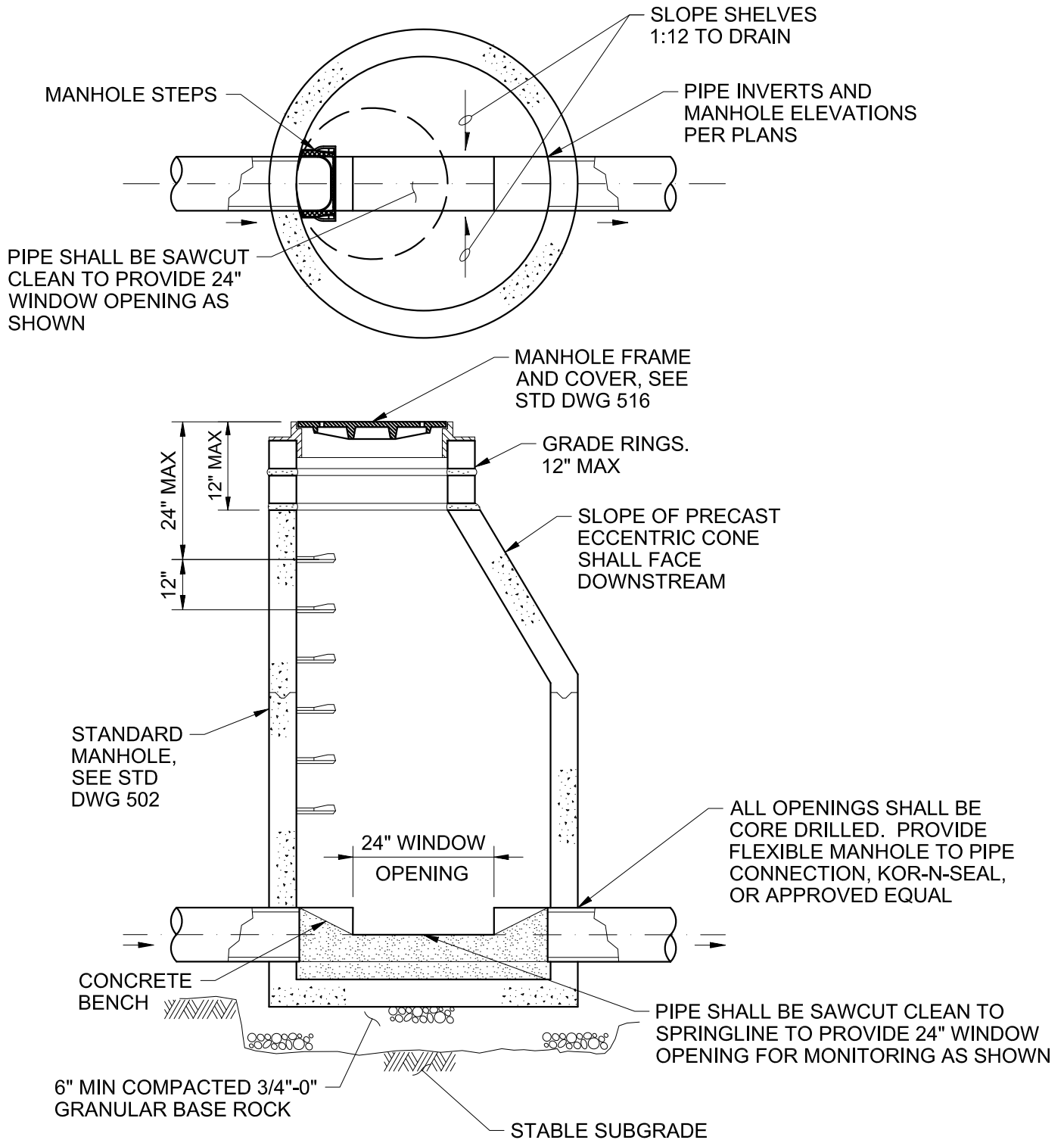
NO SCALE

DIVISION

SANITARY


DRAWING NO.

510



NOTES:

1. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENT OF ASTM C478. SEE STANDARD DRAWING 502 FOR STANDARD MANHOLE DETAILS.

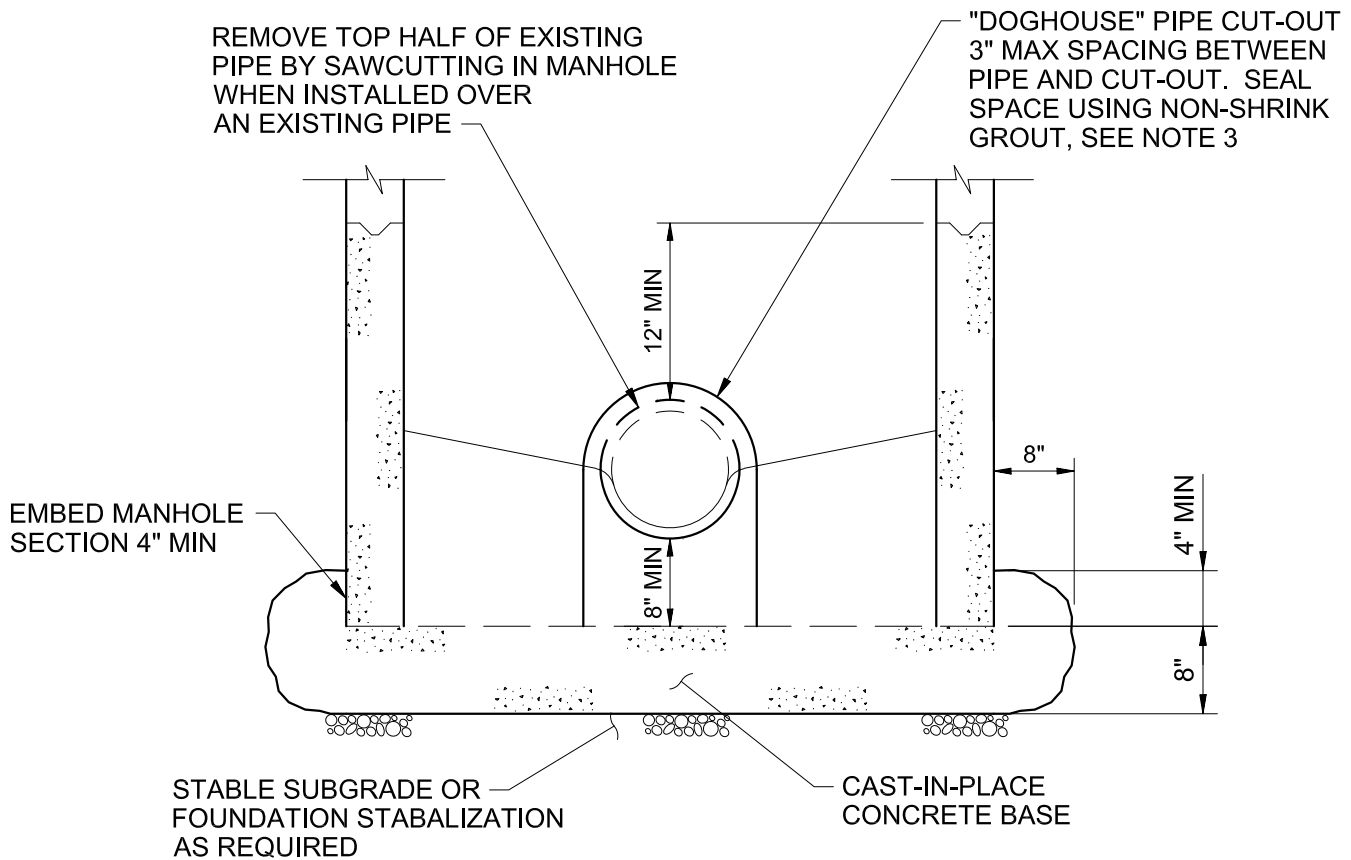


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STANDARD DRAWING TITLE
STANDARD FLOW MONITORING MANHOLE

NO SCALE
DIVISION
SANITARY
DRAWING NO.
512



NOTES:

1. CONSTRUCTION OF CAST-IN-PLACE MANHOLE BASE IS NOT PERMITTED WITHOUT APPROVAL OF THE CITY ENGINEER.
2. SEE STANDARD DRAWINGS 502, 504, AND 506 FOR APPLICABLE REQUIREMENTS RELATIVE TO THE CONSTRUCTION OF STANDARD AND FLAT-TOP MANHOLES.
3. EXISTING PIPE CUT-OUT SHALL BE SAWCUT. BREAKING OR CHIPPING OF PIPE IS NOT ALLOWED.
4. MANHOLE BASES SHALL NOT BE CONSTRUCTED WHERE THERE IS UNSTABLE SUBGRADE, STANDING OR FLOWING WATER IN THE EXCAVATION, OR ANY OTHER CONDITION THAT WILL ADVERSELY AFFECT THE INTEGRITY OF THE MANHOLE BASE.
5. THE PIPE AND BOTTOM BARREL SECTION SHALL BE SET AND SECURED IN FINAL POSITION PRIOR TO PLACING CONCRETE. CONCRETE CAST-IN-PLACE MANHOLE BASES SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,300 PSI.
6. IF THE EXCAVATION EXCEEDS THE MINIMUM DIMENSIONS REQUIRED FOR CONSTRUCTION OF THE BASE, FORMS SHALL BE ERECTED SUFFICIENT TO CONFINE THE CONCRETE TO THE SPECIFIED DIMENSIONS.



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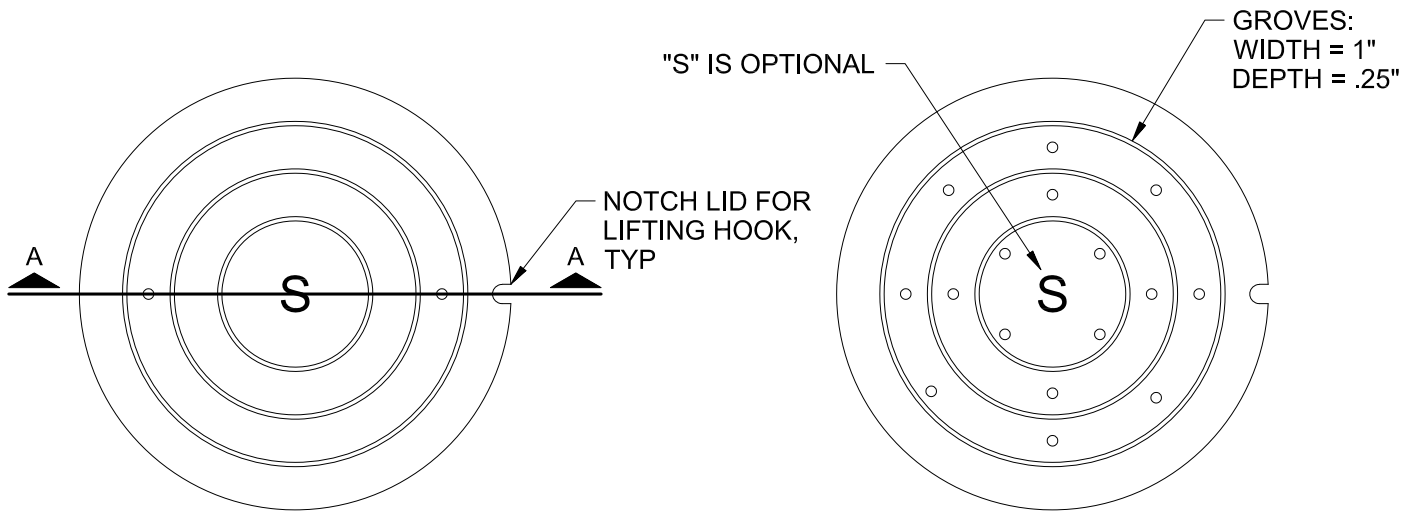
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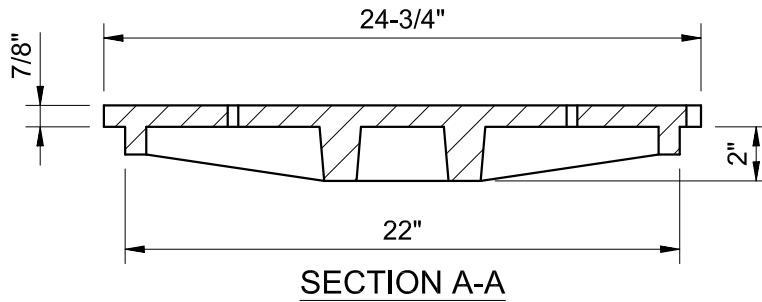
**CAST-IN-PLACE
MANHOLE BASE**

NO SCALE
DIVISION
SANITARY
DRAWING NO.
514

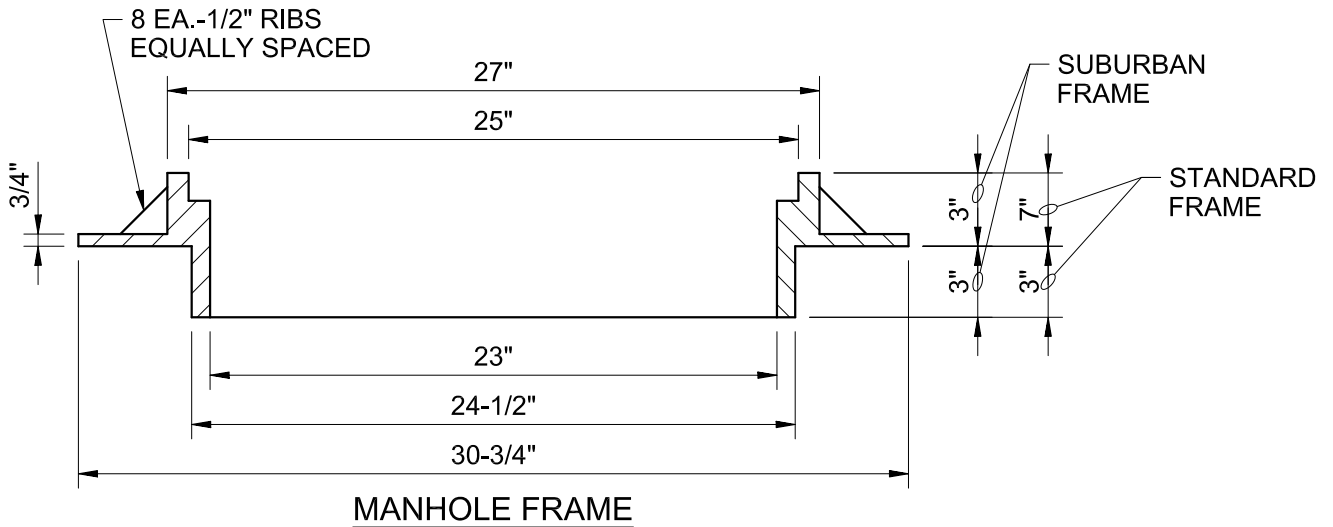


**SANITARY SEWER
MANHOLE COVER**

**STORM DRAIN
MANHOLE COVER**



SECTION A-A



MANHOLE FRAME

NOTES:

1. FRAME AND COVER ASSEMBLY SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30.
2. FRAME AND COVER ASSEMBLY SHALL BE MACHINED FOR A TRUE BEARING ALL AROUND TO PREVENT MOVEMENT OF THE COVER WITHIN FRAME UNDER TRAFFIC LOADS.
3. SUBURBAN FRAMES SHALL NOT BE USED IN MAJOR COLLECTORS AND ARTERIAL STREETS.



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**MANHOLE FRAME
AND COVER**

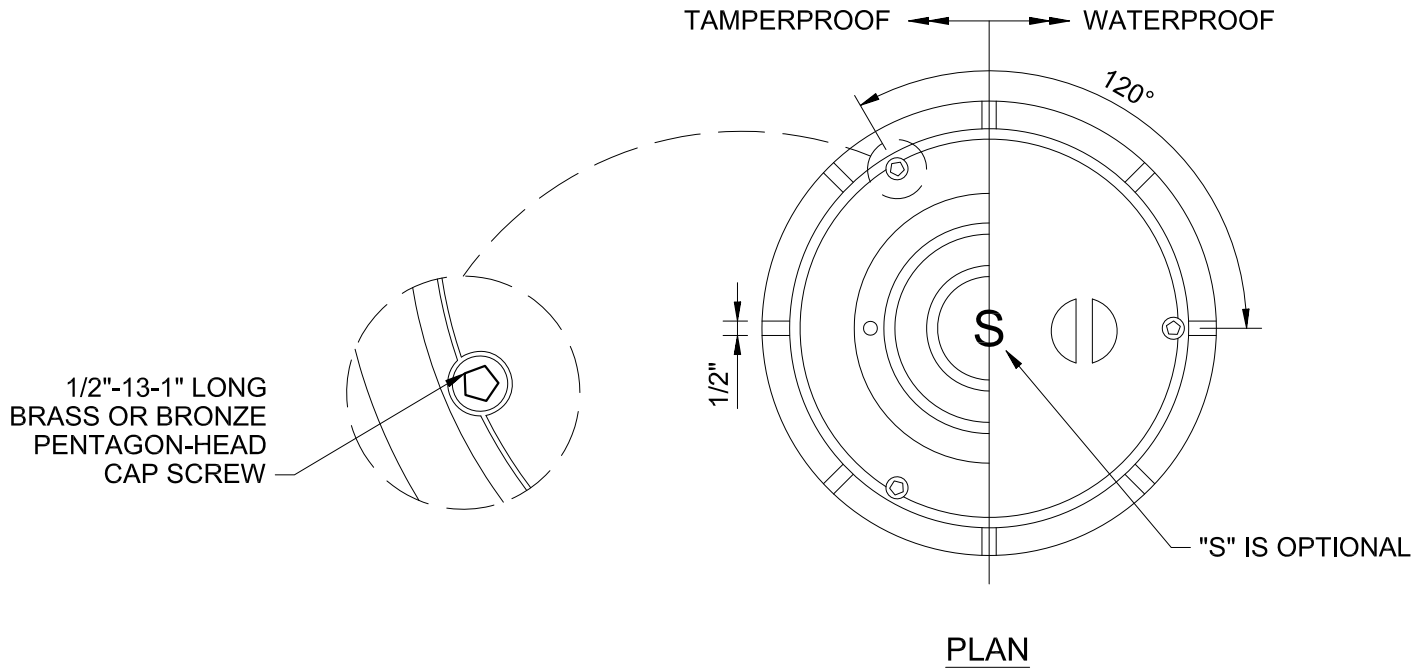
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DIVISION

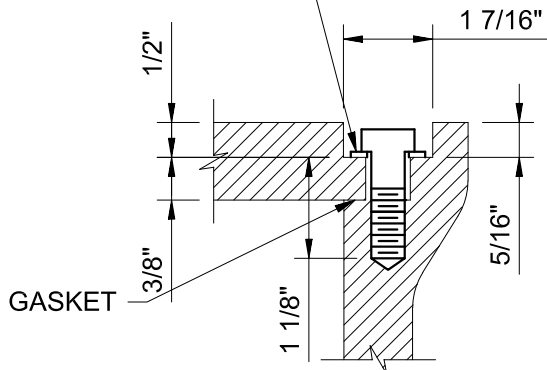
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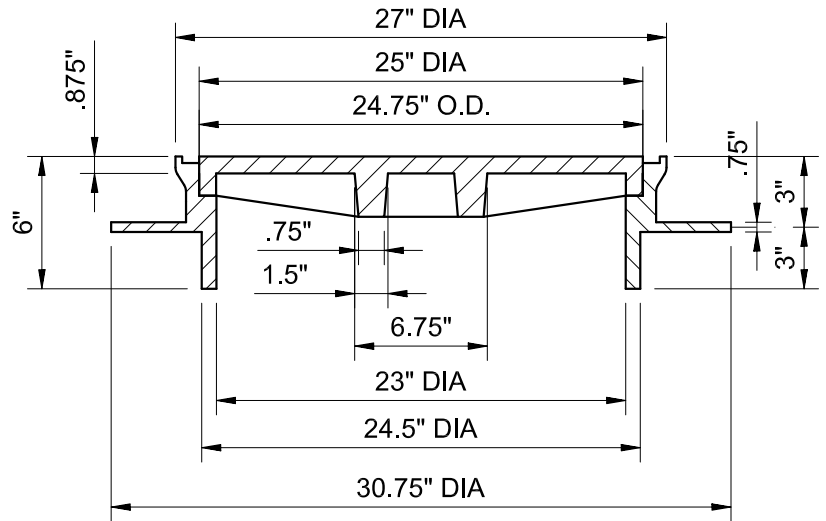
516



1 1/4" O.D. STAINLESS
STEEL WASHER 1/8"
THICK, 3 REQUIRED
PER COVER



CAP SCREW DETAIL



NOTES:

1. FRAME AND COVER ASSEMBLY SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30.
2. FRAME AND COVER ASSEMBLY SHALL BE MACHINED FOR A TRUE BEARING ALL AROUND TO PREVENT MOVEMENT OF THE COVER WITHIN FRAME UNDER TRAFFIC LOADS.
3. TAMPERPROOF COVERS REQUIRED ON SANITARY OR STORM MANHOLES LOCATED IN UNIMPROVED EASEMENTS AND RIGHT-OF-WAYS.
4. WATER TIGHT COVERS REQUIRED IF LOCATED WHERE COVER MAY BE SUBMERGED.



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**TAMPERPROOF AND
WATERPROOF
FRAME AND COVER**

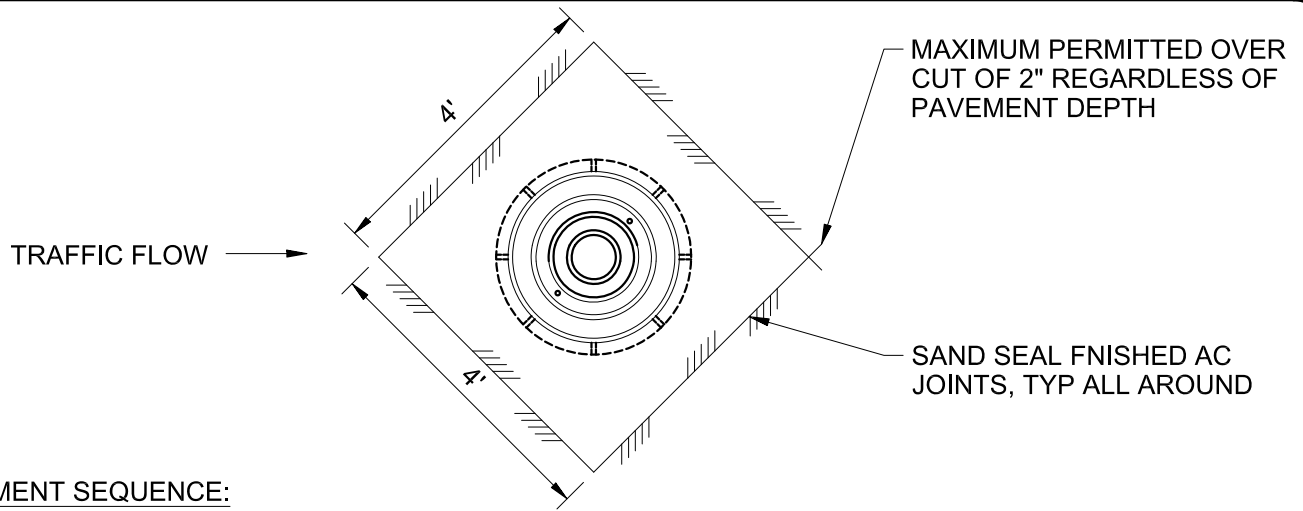
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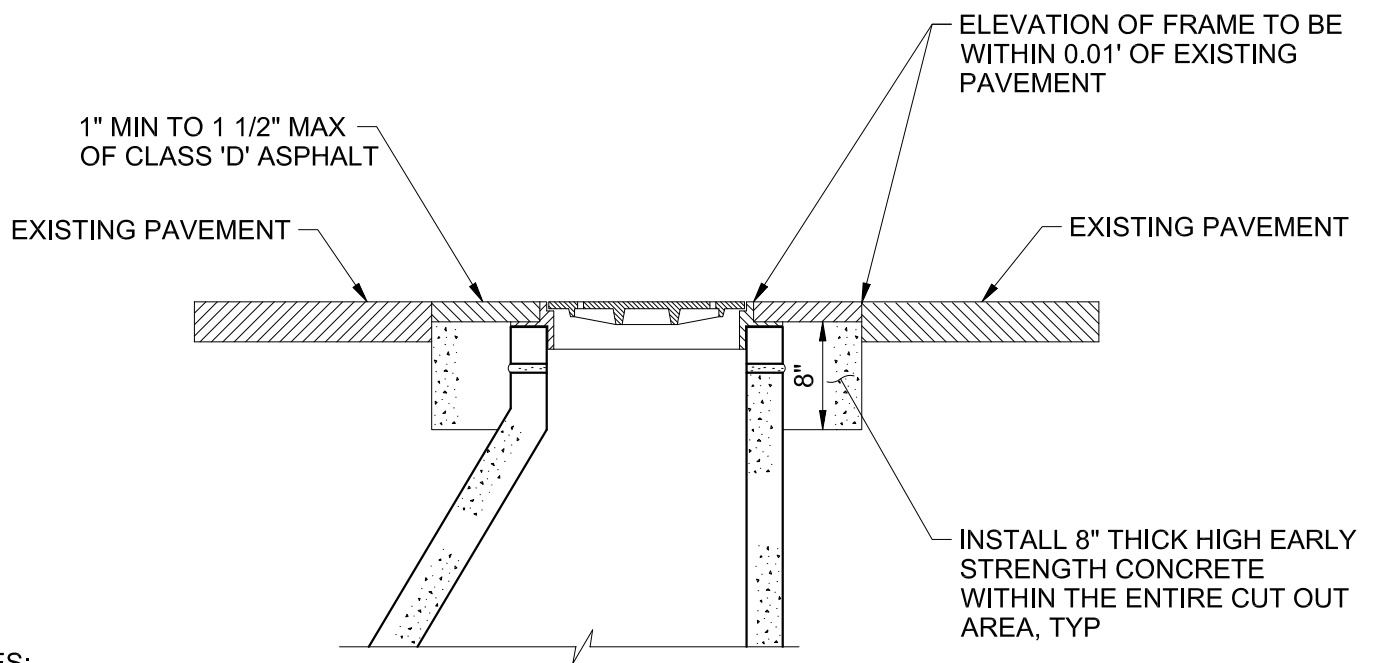
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518



ADJUSTMENT SEQUENCE:

1. COVER MANHOLE WITH BUILDING PAPER AND CONSTRUCT HMAC BASE AND WEARING COURSES.
2. SAWCUT A 4'x4' SQUARE EXCAVATION AROUND MANHOLE, 12" MINIMUM FROM MANHOLE FRAME.
3. RAISE MANHOLE FRAME AND COVER TO FINISH GRADE BY INSTALLING CONCRETE RINGS AND LEVELING MORTAR.
4. BACKFILL WITH HIGH EARLY STRENGTH CONCRETE TO LIMITS SHOWN.



NOTES:

1. FINISH ELEVATION OF MANHOLE FRAME AND COVER ASSEMBLIES SHALL BE WITHIN 0.01 FT. THE MANHOLE FRAME AND COVER ASSEMBLY SHALL BE ADJUSTED AS SPECIFIED HEREIN.
2. SAWCUT ASPHALT SHALL BE REMOVED AND THE ENTIRE AREA EXCAVATED TO A DEPTH OF 9.5" BELOW FINISH GRADE OF THE STREET. HIGH EARLY STRENGTH CONCRETE SHALL BE PLACED TO A DEPTH OF 8" WITHIN THE ENTIRE CUT AREA. THE CONCRETE SHALL BE COVERED WITH CLASS "D" ASPHALT CONCRETE WITH A DEPTH OF 1" MIN TO 1 1/2" MAX.
3. MAXIMUM DISTANCE BETWEEN THE TOP OF THE CONE SECTION AND FINAL SURFACE GRADE SHALL NOT EXCEED 12".



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**MANHOLE FRAME
AND COVER
ADJUSTMENT**

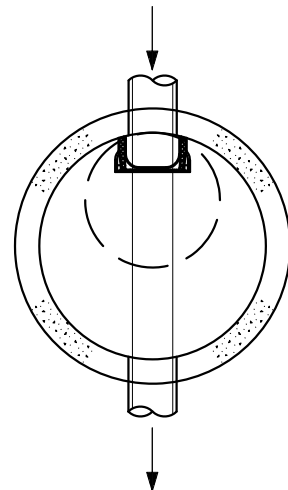
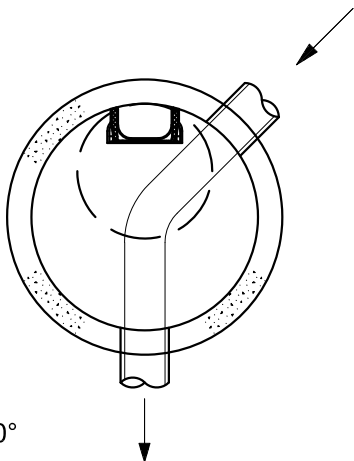
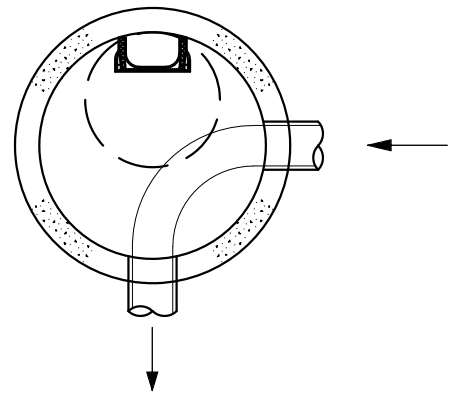
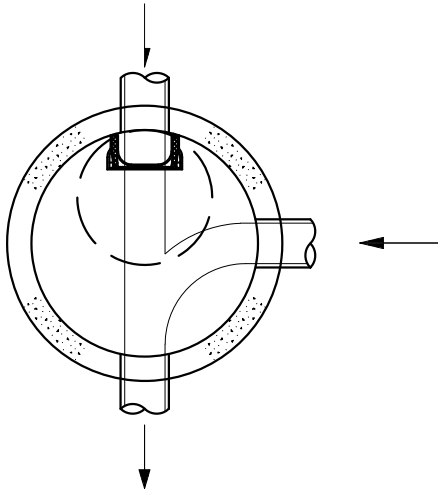
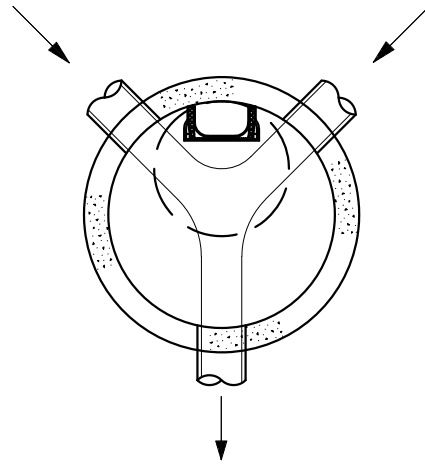
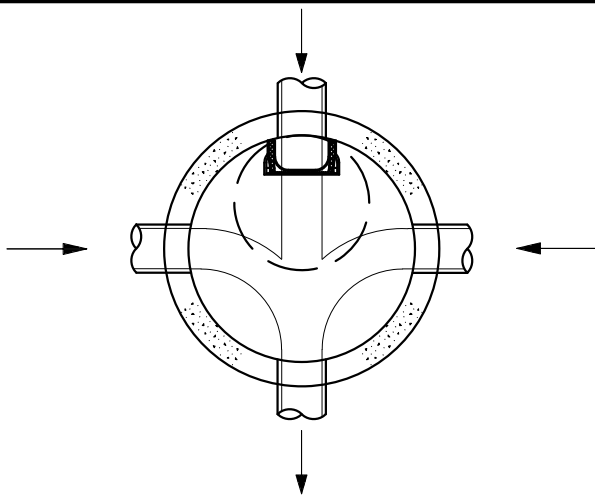
NO SCALE

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DRAWING NO.

520



FOR ANGLES
>90° AND <180°

NOTES:

1. SEE STANDARD DRAWING 516 FOR MANHOLE FRAME AND COVER ASSEMBLY.
2. SEE STANDARD DRAWING 524 FOR MANHOLE STEPS.
3. ACCESS FOR LARGE DIAMETER MANHOLES SHALL BE AS APPROVED BY CITY ENGINEER. SEE STANDARD DRAWING 504.



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**MANHOLE ACCESS
LOCATIONS**

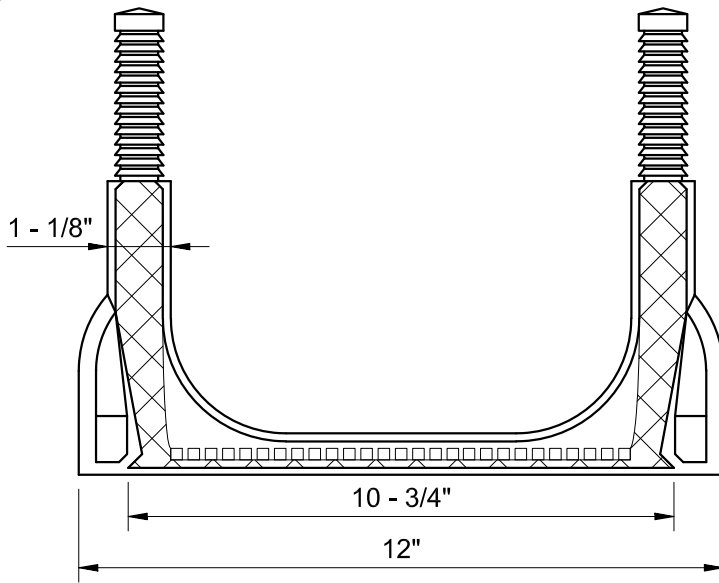
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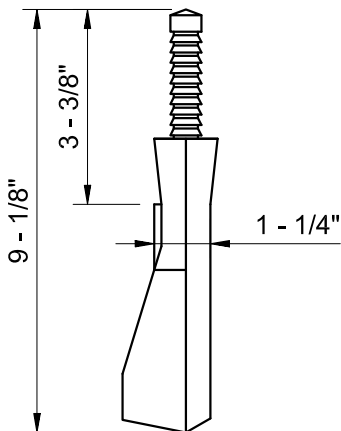
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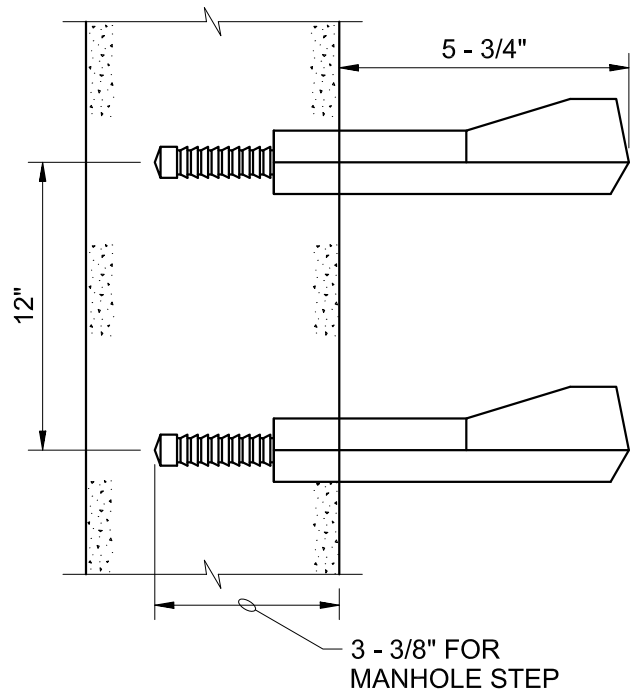
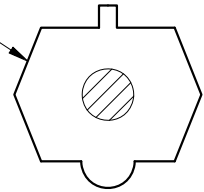
522



COPOLYMER POLYPROPYLENE PLASTIC




1/2" GRADE 60 REINFORCEMENT



NOTES:

1. MANHOLE STEPS SHALL BE TIGHT AND FIRMLY EMBEDDED AND SHALL MEET ASTM C-497 TESTS FOR WITHSTANDING PULLING OUT. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THAT MANHOLE SECTION OR CONE.
2. MANHOLE STEPS MUST CONFORM WITH ASTM C-478. STEEL REINFORCING BAR SHALL BE MINIMUM 1/2" GRADE 60 MEETING REQUIRMENTS OF ASTM A-615 ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.
3. TOP STEP SHALL BE NO GREATER THAN 24" FROM TOP OF CASTING.
4. STEPS SHALL BE ALIGNED VERTICALLY AND SPACED 12-INCHES ON CENTER.
5. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN TYPE AND SIZE. MIXING OF UNMATCHED STEPS WITHIN THE SAME MANHOLE IS NOT PERMITTED.



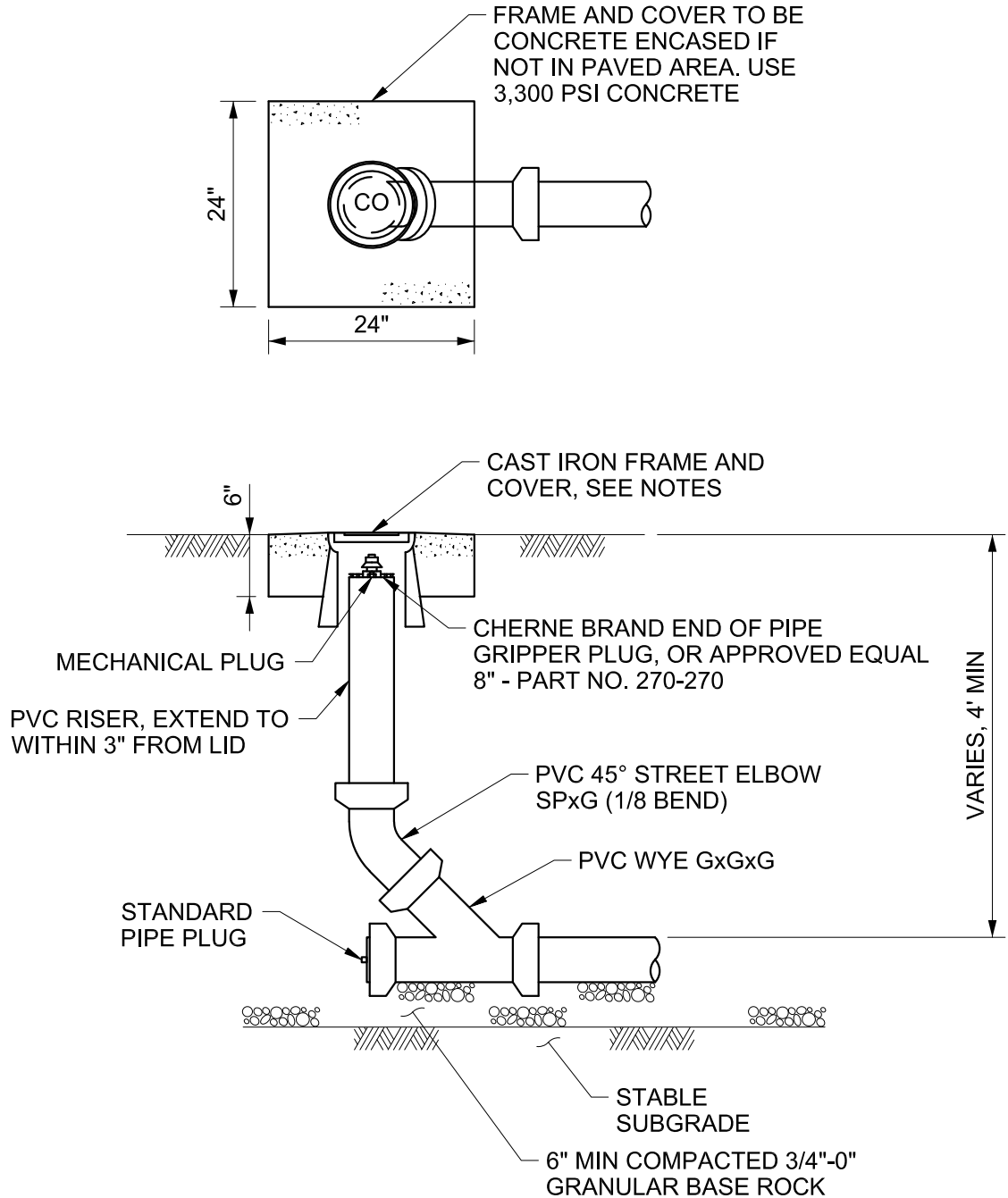
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REVISIONS	

STANDARD DRAWING TITLE


MANHOLE STEP DETAIL

NO SCALE
DIVISION
SANITARY
DRAWING NO.
524



NOTES:

1. CLEANOUTS ON MAINLINES SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER.
2. COVER AND FRAME ASSEMBLY SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30 AND SHALL BE MACHINED TO A TRUE BEARING ALL AROUND.
3. CLEANOUT FOR ALL AREAS SHALL BE OLYMPIC FOUNDRY MODEL M1035.



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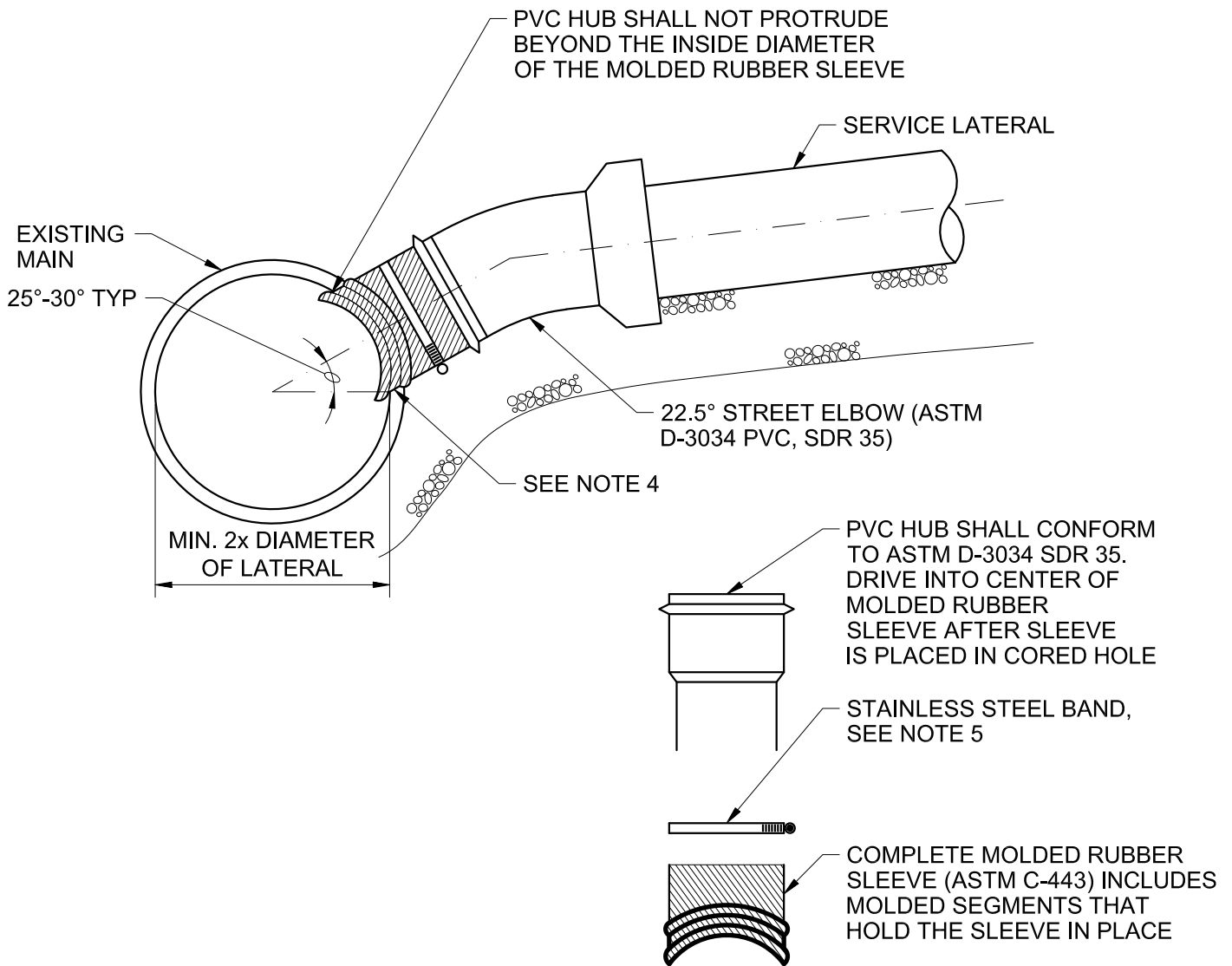
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STANDARD DRAWING TITLE

MAINLINE CLEANOUT DETAIL

NO SCALE
DIVISION
SANITARY
DRAWING NO.
526



NOTES:

1. TAPS SHALL NOT BE MADE WITHOUT CITY ENGINEER APPROVAL AND SHALL NOT BE PERFORMED EXCEPT IN THE PRESENCE OF THE CITY ENGINEER.
2. MANUFACTURED TEE OR WYE FITTINGS SHALL BE USED ON ALL NEW MAINLINES. INSERT-A-TEES ARE ALLOWED IN NEWLY CONSTRUCTED SEWER MAINS 12" AND LARGER INSIDE DIAMETER.
3. HOST PIPE FOR INSERT-A-TEES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. SEWER MAINS SHALL BE TWO SIZES LARGER THAN AN INSERT-A-TEE. FOR 8" MAINS, A 4" MAXIMUM TAP SIZE SHALL BE USED. A CUT-IN TEE SHALL BE USED FOR 6" LATERAL CONNECTIONS ON 8" MAINLINES WITH APPROVED COUPLERS.
4. ALL INSERT-A-TEE HOLES SHALL BE MACHINED DRILLED AND CORED. CENTERLINE OF TAP SHALL BE ABOVE SPRINGLINE AS SHOWN.
5. STAINLESS STEEL BAND SHALL BE USED TO SECURE UPPER HALF OF MOLDED RUBBER SLEEVE TO THE PVC HUB. STAINLESS STEEL BAND SHALL BE 300 SERIES, 9/16" BAND WIDTH. ATTACH WITH HEX HEAD SLOTTED SCREW.



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STANDARD DRAWING TITLE

INSERT-A-TEE
CONNECTION

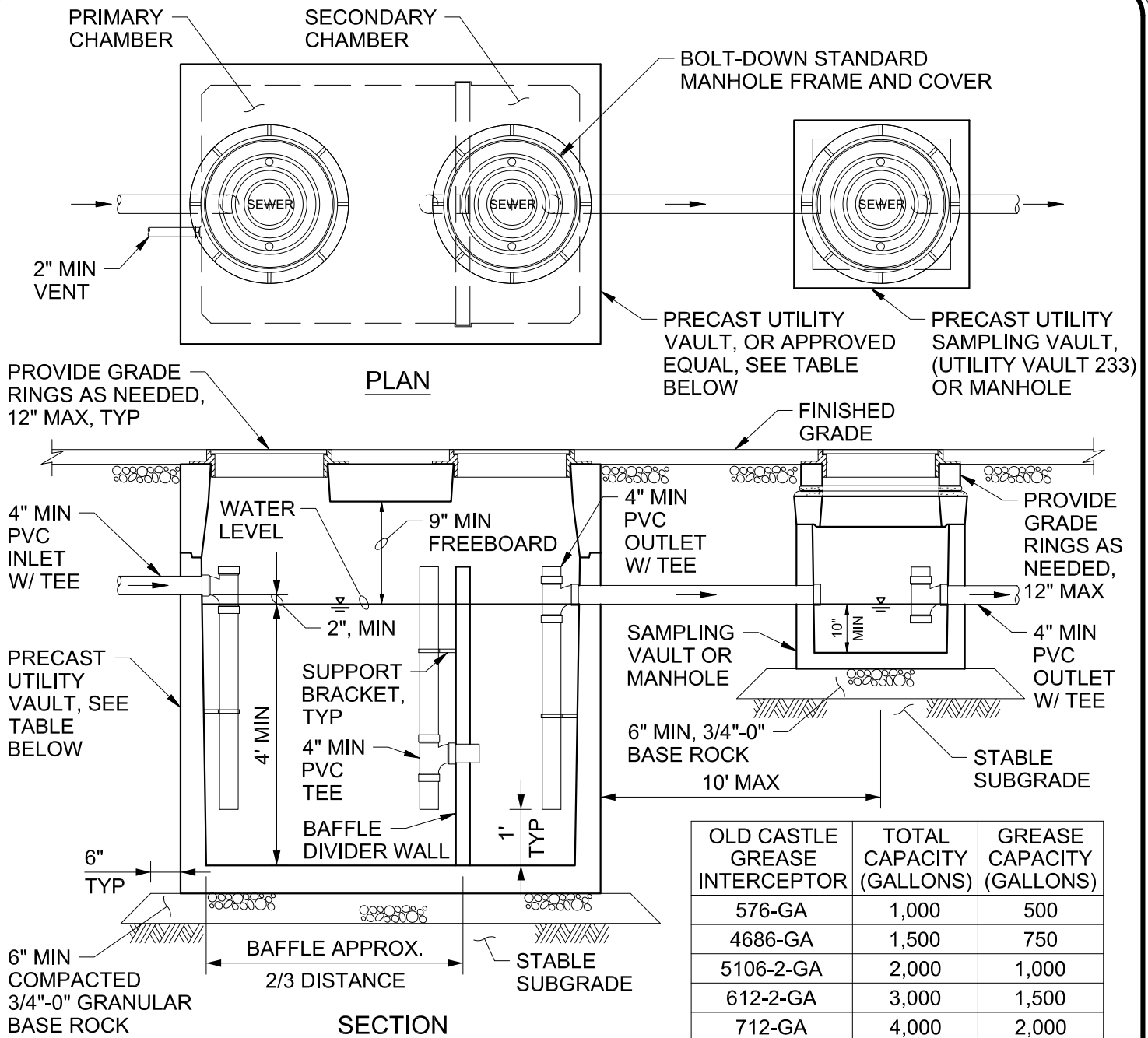
NO SCALE

DIVISION

SANITARY

DRAWING NO.

530



NOTES:

- INTERCEPTOR AND BAFFLE DIVIDER WALL SHALL BE PRECAST CONCRETE, AS MANUFACTURED BY OLD CASTLE OR APPROVED EQUAL. GREASE INTERCEPTORS 5,000 GALLONS OR LARGER SHALL BE SUPPLIED WITH 6" PVC PIPING. ALL INTERIOR HARDWARE SHALL BE STAINLESS STEEL.
- INTERCEPTOR, INSTALLATION, AND MAINTENANCE SHALL COMPLY WITH SECTION 1014.3 OF THE OREGON PLUMBING SPECIALTY CODE AND APPLICABLE PROVISIONS OF THE STAYTON MUNICIPAL CODE. TOTAL CAPACITY OF INTERCEPTOR SHALL NOT BE LESS THAN 1,000 GALLONS.
- INTERCEPTOR SHALL BE WATERTIGHT AND MUST BE VENTED AT ALL TIMES. INTERCEPTOR SHALL BE CAPABLE OF SUPPORTING H-20 TRAFFIC LOADING.
- INTERCEPTOR SHALL BE FILLED WITH CLEAN STABLE WATER AFTER INSTALLATION AND PRIOR TO USE.



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STANDARD DRAWING TITLE

GREASE INTERCEPTOR

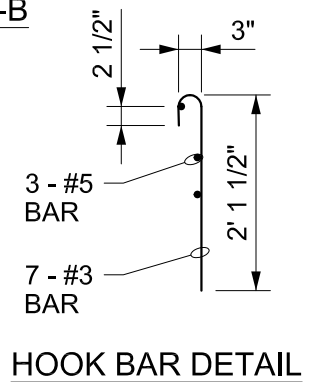
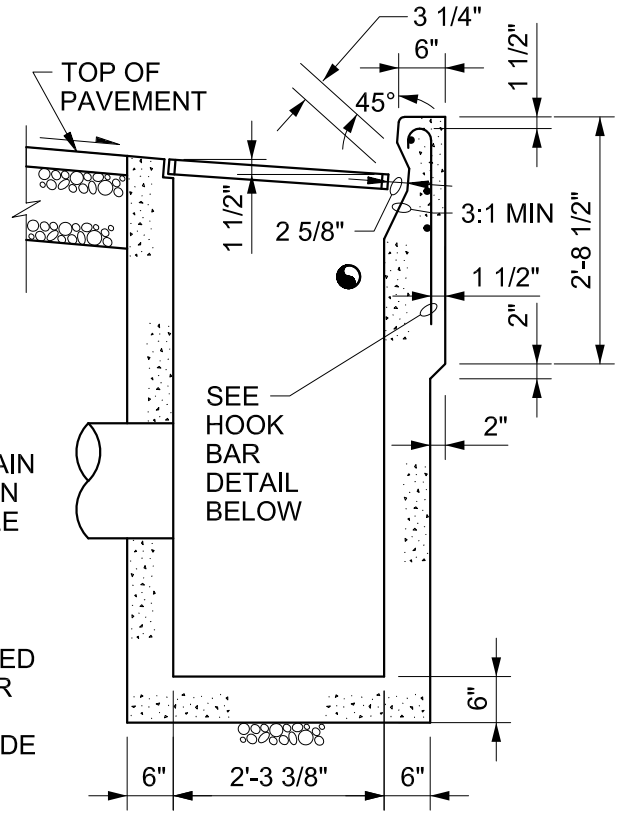
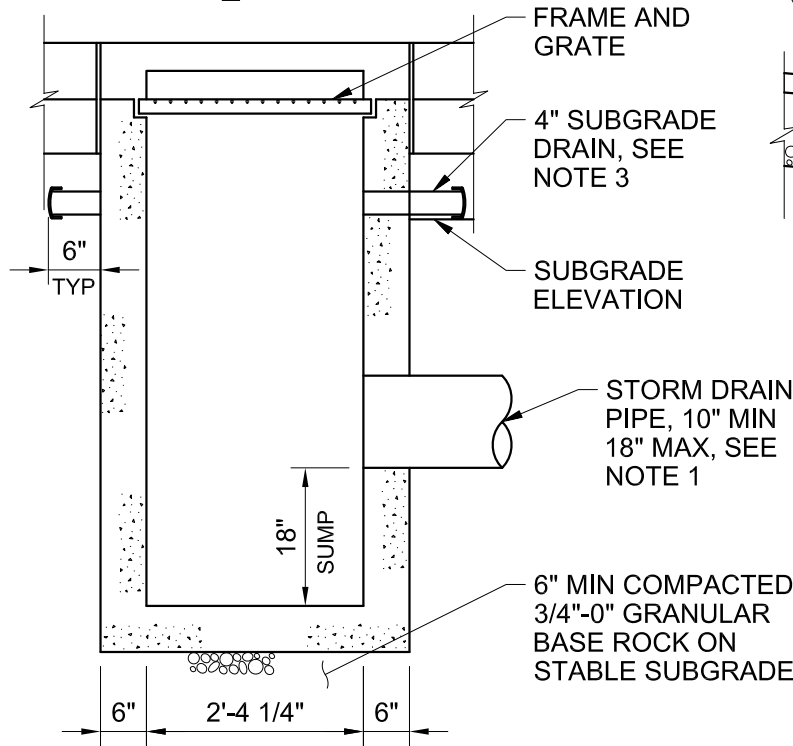
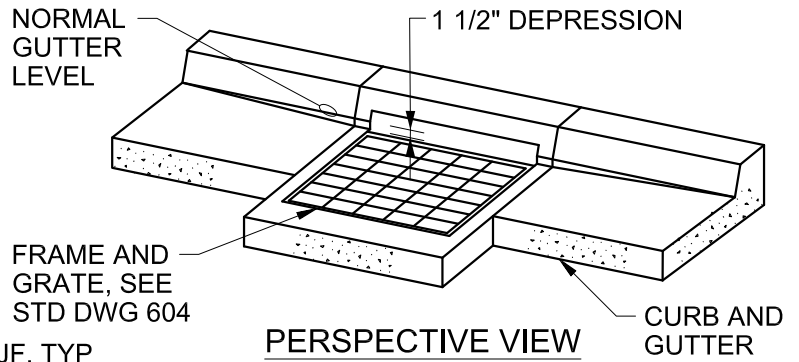
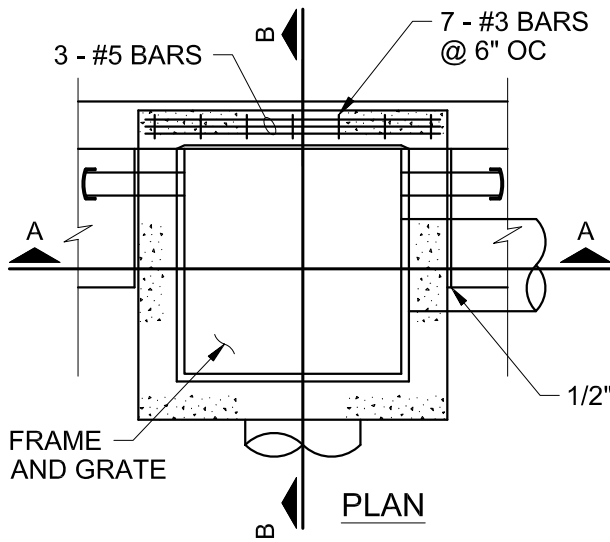
NO SCALE

DIVISION

SANITARY

DRAWING NO.

532



NOTES:

1. SEE PLANS FOR PIPE SIZE, LOCATION, AND INVERTS. PIPE SHALL BE FLUSH WITH INSIDE WALL.
2. CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH.
3. SUBGRADE DRAINS SHALL BE 4" SCHEDULE 40 PVC PERFORATED WITH 6 EACH - 3/8" DIAMETER HOLES DRILLED IN LOWER SIDE. CAP SHALL HAVE 4 EACH - 3/8" DIAMETER HOLES. LOCATE JUST ABOVE SUBGRADE AS SHOWN. TWO DRAINS REQUIRED WHEN LOCATED IN A SAG VERTICAL CURVE.
4. WHEN PRECAST CATCH BASINS ARE USED AS AN ALTERNATE TO CAST-IN-PLACE, PRECAST UNITS SHALL HAVE 5" MIN THICK WALLS AND CONFORM TO ASTM C-913.

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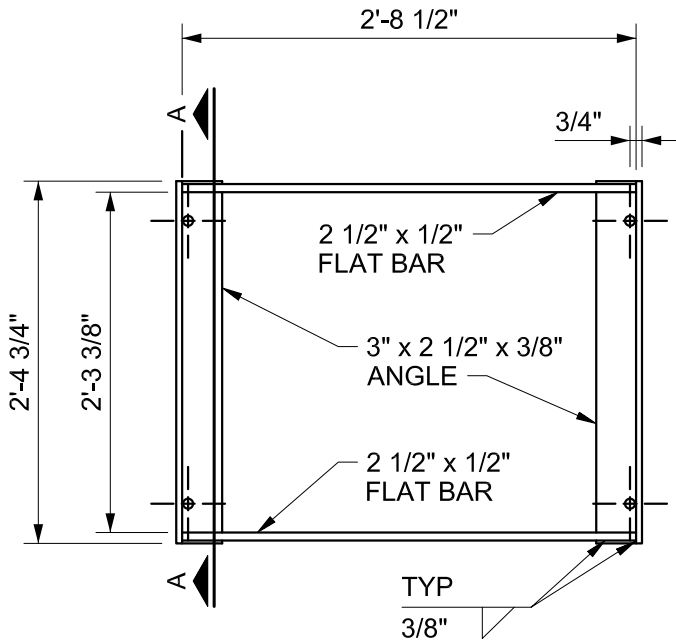
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STANDARD DRAWING TITLE

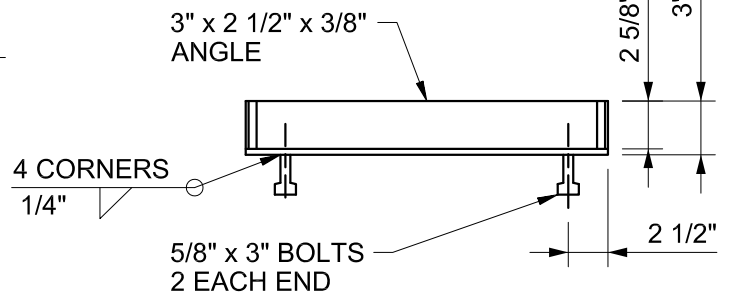
SIDE-INLET CATCH BASIN

(TYPE CG-2)

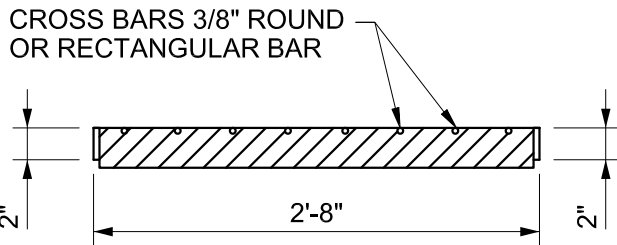
NO SCALE
DIVISION
STORM
DRAWING NO.
602



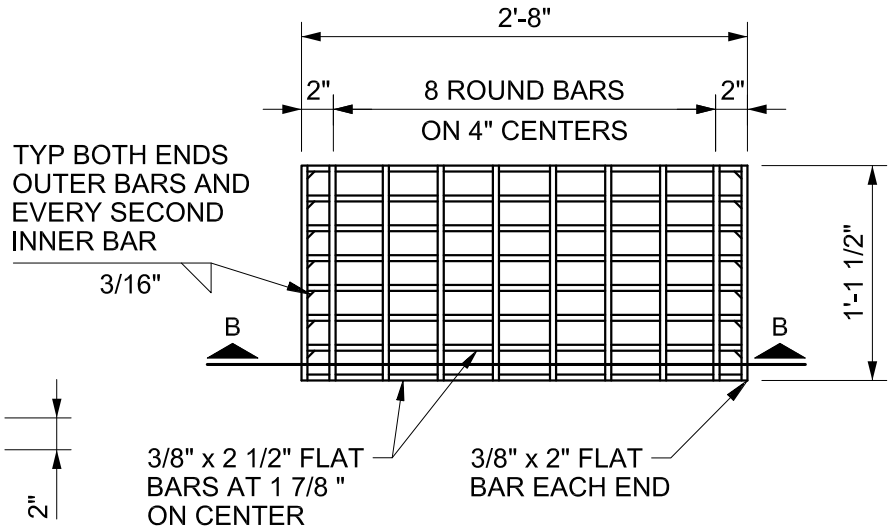
FRAME PLAN



FRAME SECTION A-A



GRATE SECTION B-B



GRATE PLAN

NOTES:

1. A TOTAL OF 2 GRATES ARE REQUIRED FOR EACH SIDE-INLET CATCH BASIN.
2. ALL FRAME AND GRATE MATERIAL SHALL BE NEW ASTM A-36 STRUCTURAL STEEL.
3. GRATES SHALL REST FIRMLY ON FRAME. USE VERTICAL BEADS IN CORNERS AND FILLET WELD JOINTS ON BOTTOM OF FRAME.



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**SIDE-INLET
CATCH BASIN
FRAME AND GRATE**

NO SCALE

DIVISION

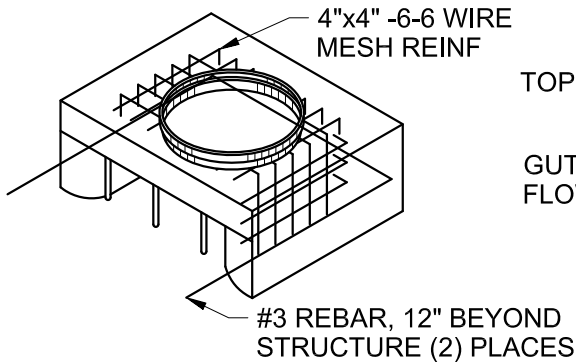
STORM

DRAWING NO.

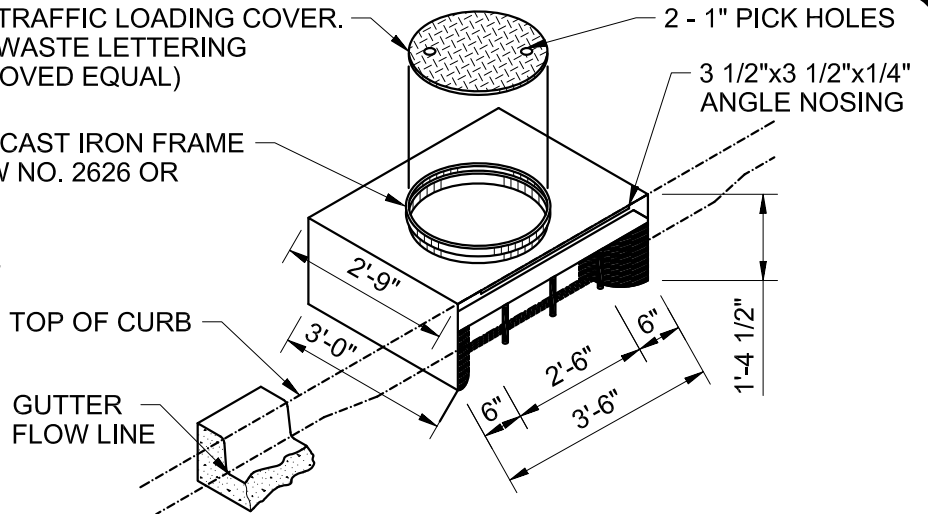
604

24-3/4" CLASS 30 CAST IRON HEAVY TRAFFIC LOADING COVER.
NON-SLIP SURFACE WITH DUMP NO WASTE LETTERING
AND IMAGE (EJIW NO. 2626 OR APPROVED EQUAL)

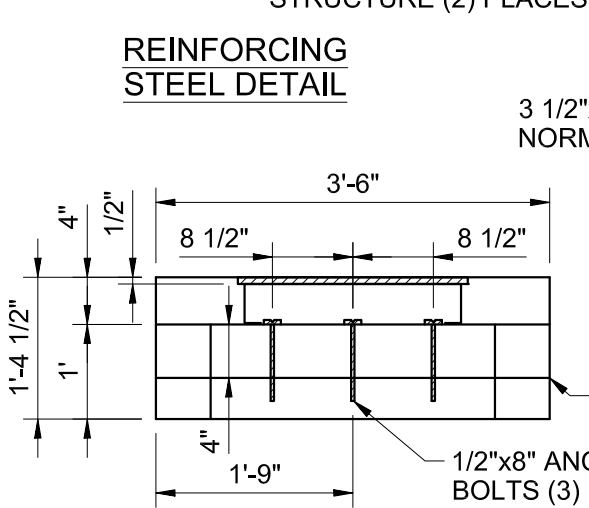
CLASS 30, 4 1/4"x 23-1/4" FLANGE UP CAST IRON FRAME
RING HEAVY TRAFFIC LOADING (EJIW NO. 2626 OR
APPROVED EQUAL)



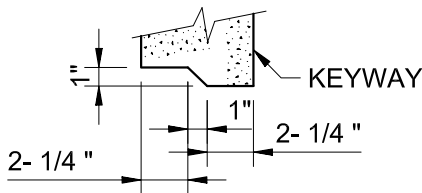
REINFORCING STEEL DETAIL



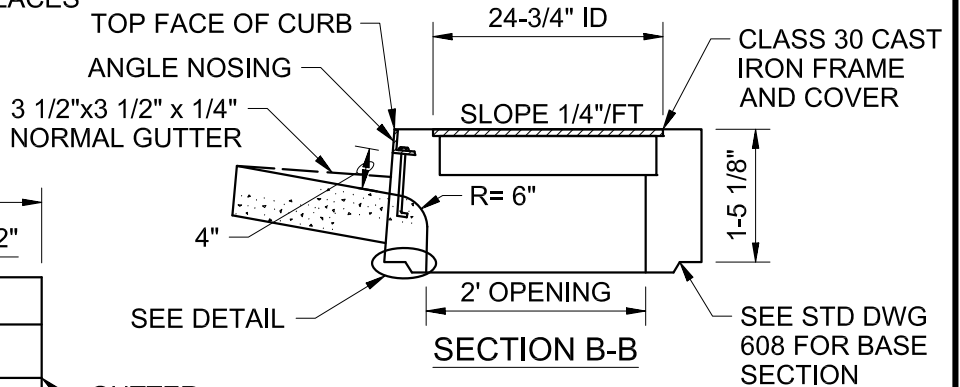
PERSPECTIVE VIEW



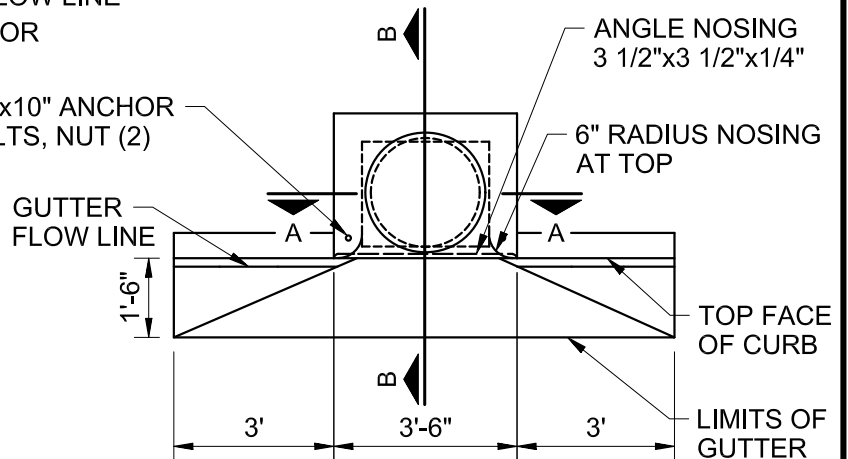
SECTION A-A



DETAIL



SECTION B-B



PLAN

NOTES:

1. CONCRETE SHALL BE 3300 PSI IN 20 DAYS.
2. TOP SHALL BE REINFORCED WITH 4"x4"-6-6 WIRE MESH.
3. ALL METAL PARTS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. COVER SHALL BE ASTM A-48 CLASS 30 CAST IRON.
5. ACCEPTABLE ALTERNATIVE PRECAST REINFORCED CONCRETE TOP SECTION SHALL BE AS MANUFACTURED BY UTILITY VAULT MODEL CI-30-23FC OR APPROVED EQUAL.



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**CURB INLET
TOP SECTION**
(TYPE CG-3)

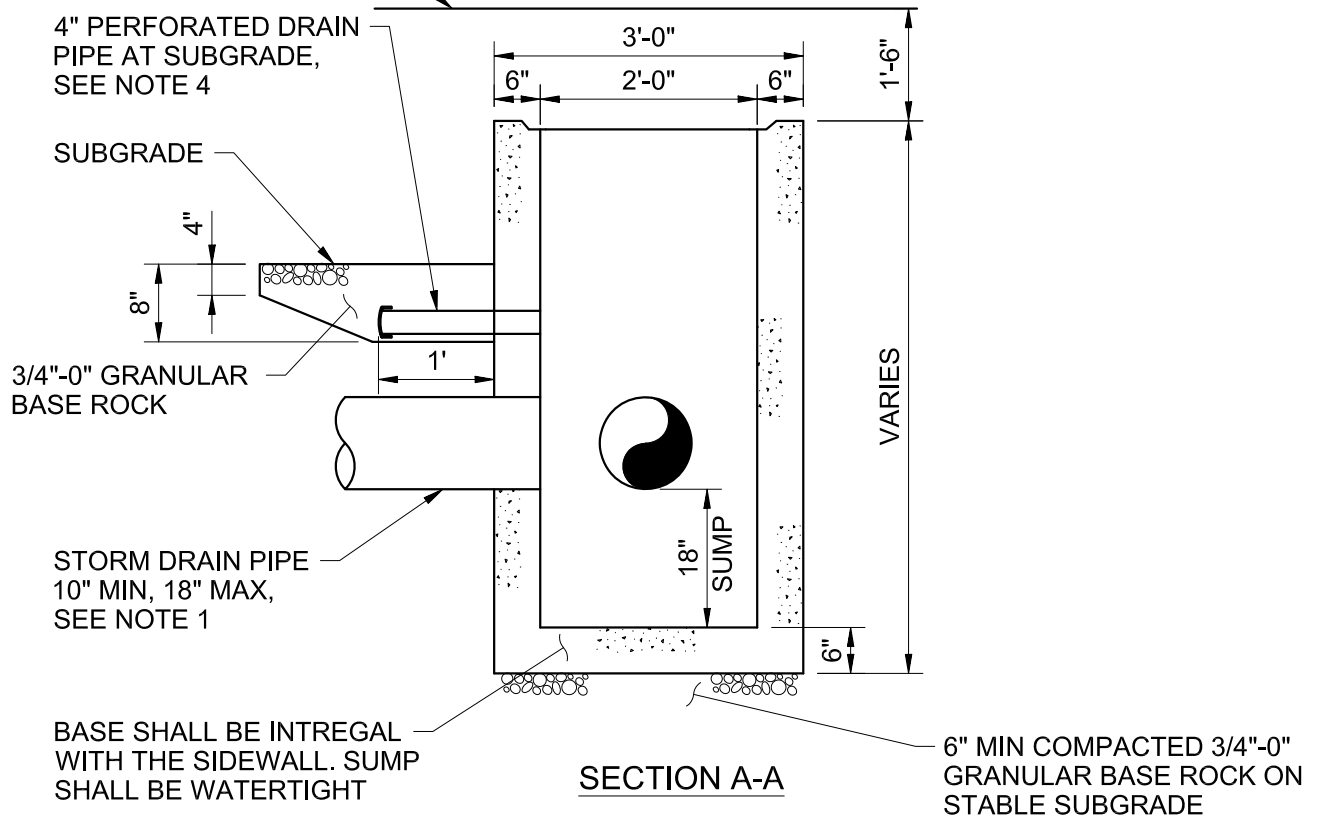
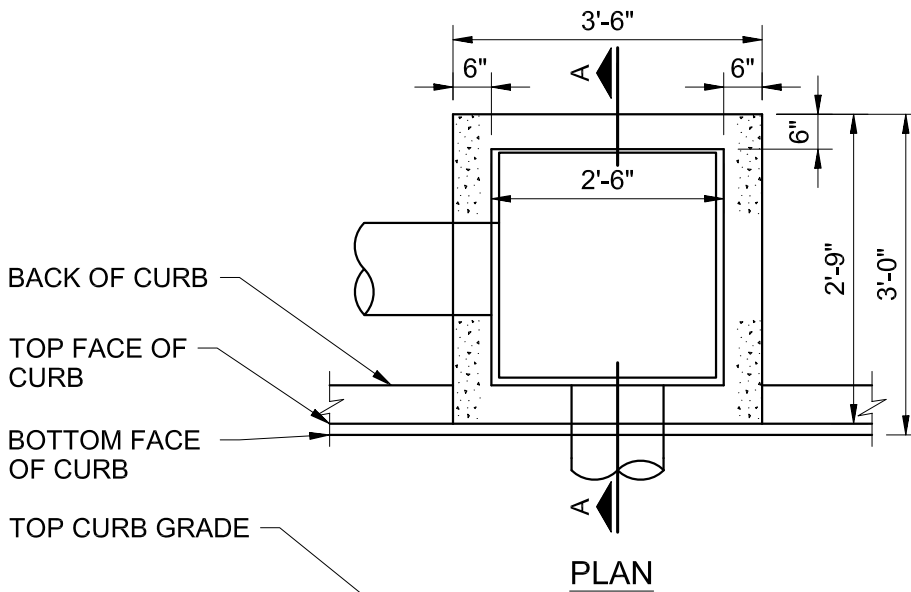
NO SCALE

DIVISION

STORM

DRAWING NO.

606



NOTES:

1. SEE PLANS FOR PIPE SIZE, LOCATION , AND INVERTS. PIPE SHALL BE FLUSH WITH INSIDE WALL.
2. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,300 PSI.
3. SEE STANDARD DRAWING 606 FOR CURB INLET TOP.
4. DRAIN SHALL BE SCH 40 PVC WITH CAP. DRAIN PIPE SHALL HAVE 6 EA-3/8" DIAMETER DRILL HOLES IN LOWER SIDE. CAP SHALL HAVE 4 EA 3/8" DIAMETER DRILL HOLES. TWO DRAINS REQUIRED WHEN CURB INLET LOCATED AT SAG VERTICAL CURVE.



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STANDARD DRAWING TITLE

**CURB INLET
BASE SECTION**

(TYPE CG-3)

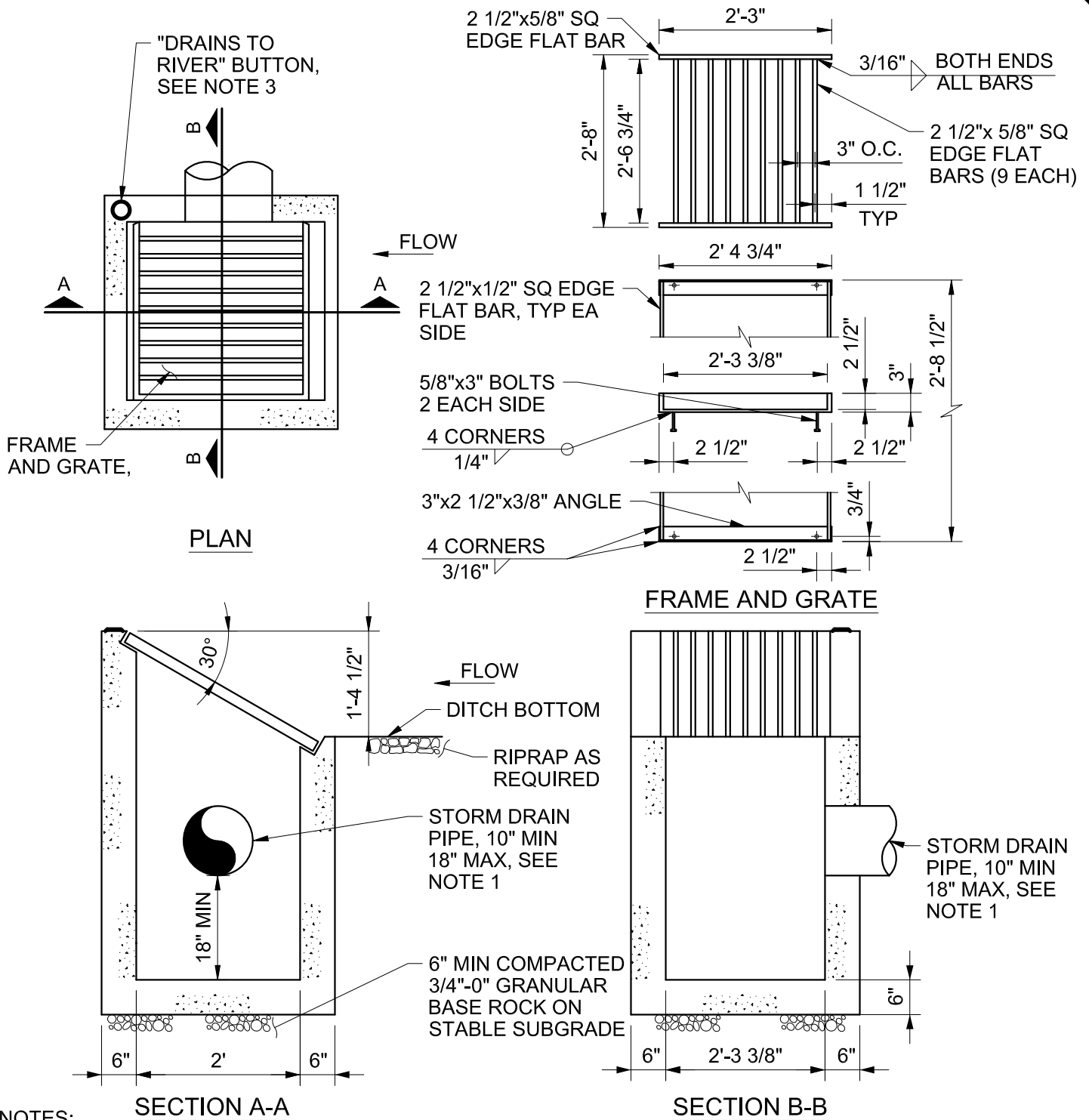
NO SCALE

DIVISION

STORM

DRAWING NO.

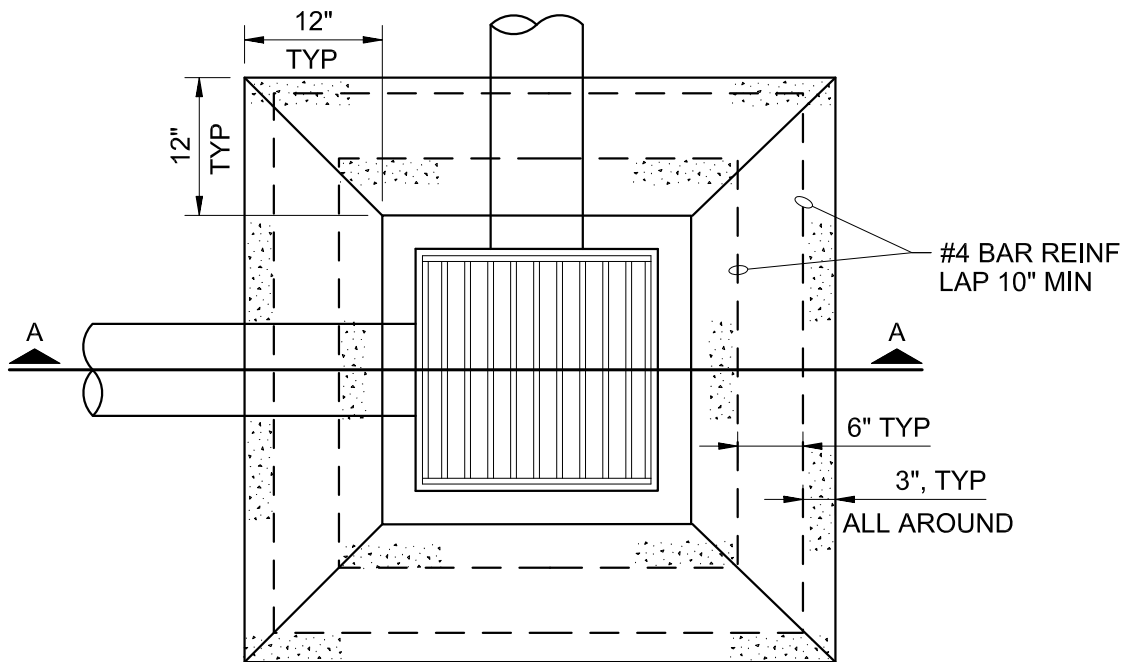
608



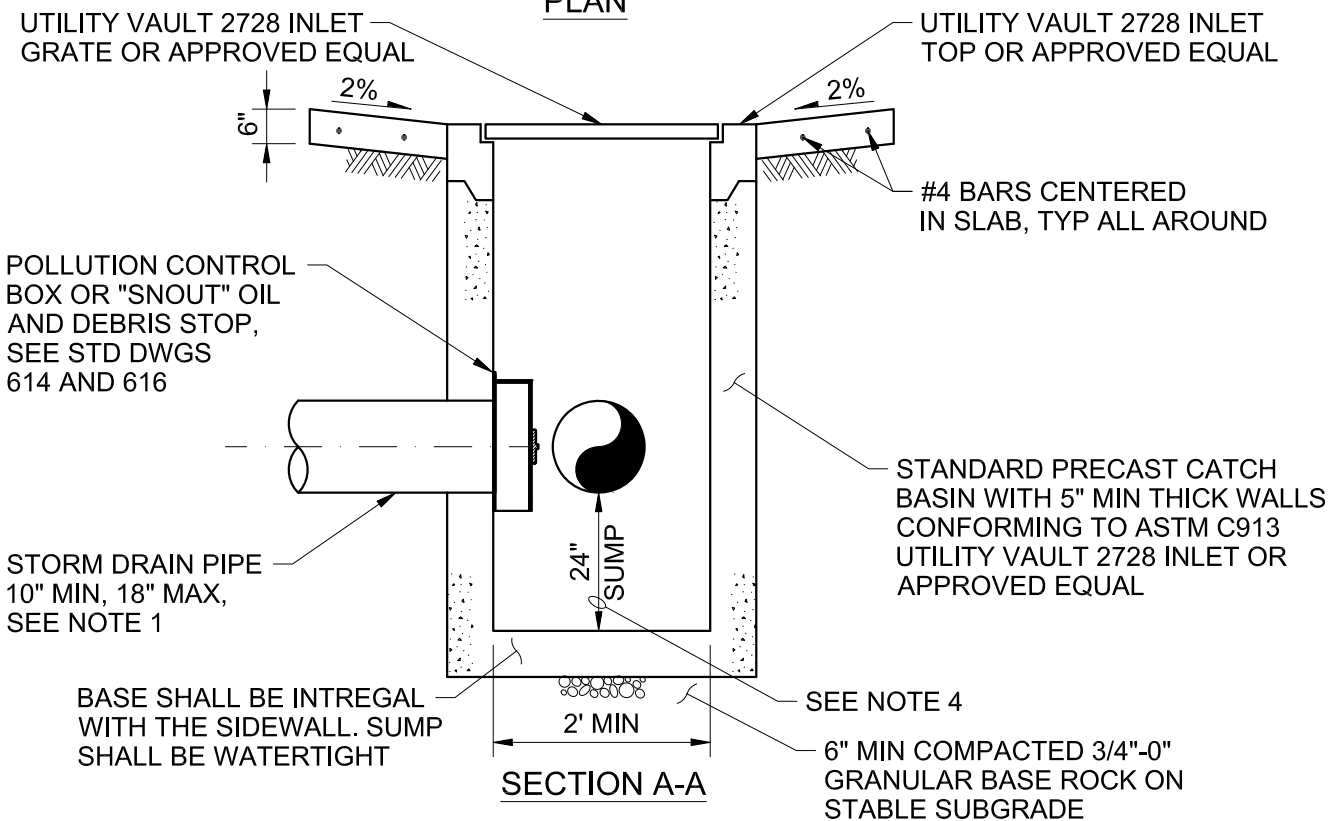
NOTES:

1. SEE PLANS FOR PIPE SIZE, LOCATION AND INVERTS. PIPE SHALL BE FLUSH WITH INSIDE OF WALL.
2. CONCRETE SHALL BE 3,300 PSI AT 28 DAY STRENGTH.
3. SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT THE CITY ENGINEER FOR BUTTON SPECIFICATIONS (TYPICAL).
4. ACCEPTABLE ALTERNATIVE PRECAST DITCH INLETS SHALL BE 2728 DITCH INLET AS MANUFACTURED BY UTILITY VAULT OR APPROVED EQUAL.

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	REVIEWED BY	<h1 style="margin: 0;">DITCH INLET</h1> <p>(TYPE D)</p>		DIVISION
	JTA / LSL 09/21			STORM
	NAME DATE			DRAWING NO.
REVISIONS			610	



PLAN



SECTION A-A

NOTES:

1. NOT FOR USE IN VEHICULAR TRAFFIC AREAS.
2. FRAME AND GRATES, WHEN CONSTRUCTED, SHALL BE FOR BICYCLE SAFETY AND SHALL BE H-20 RATED.
3. ALL REINFORCEMENT SHALL BE 3" MIN CLEAR OF NEAREST FACE OF CONCRETE.
4. ADDITIONAL SUMP DEPTH MAY BE REQUIRED BY CITY ENGINEER OR REQUIRED PER POLLUTION CONTROL BOX OR "SNOUT" OIL AND DEBRIS STOP MANUFACTURER.



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**AREA DRAINAGE
BASIN OR FIELD INLET**

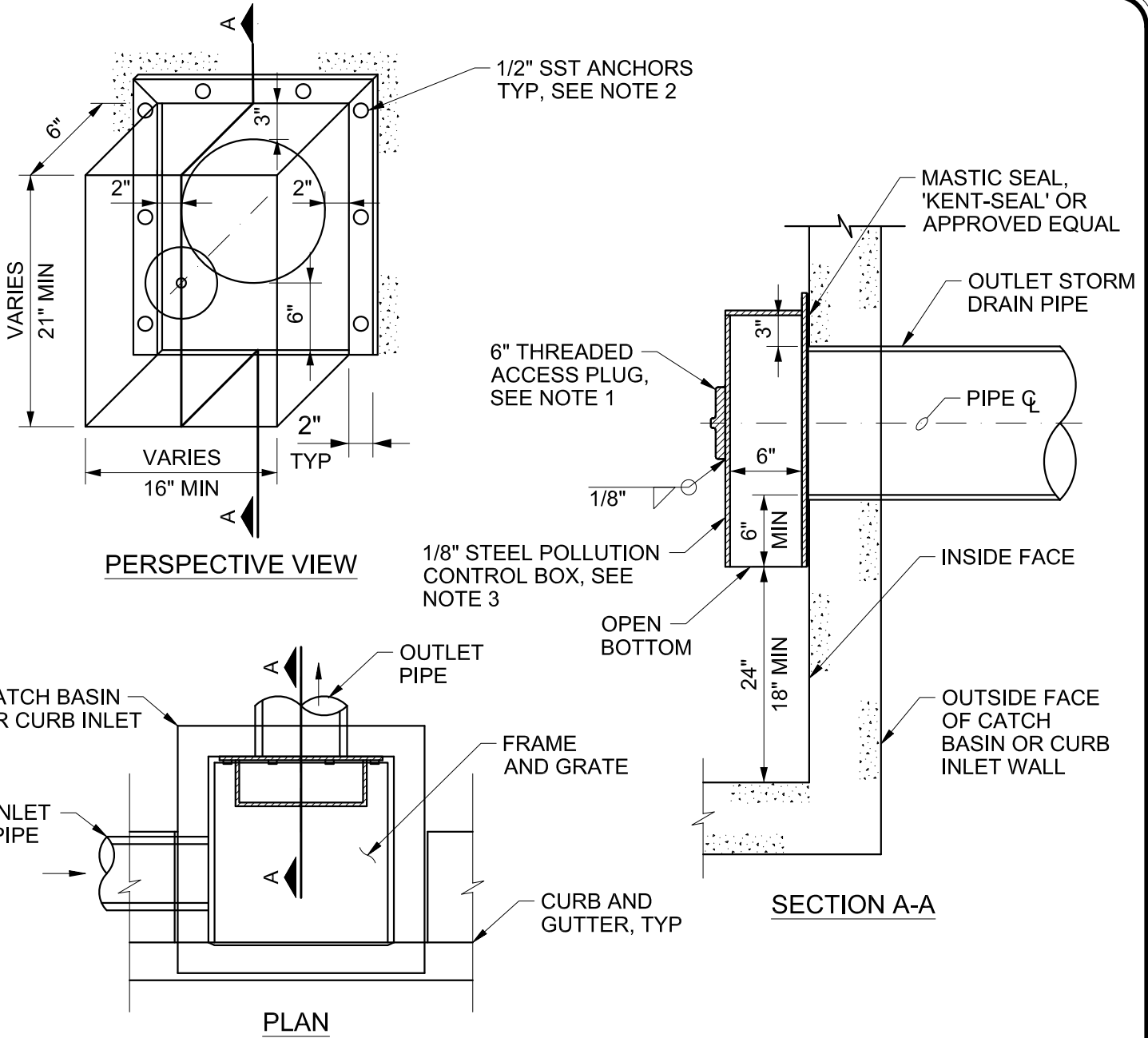
NO SCALE

DIVISION

STORM


DRAWING NO.

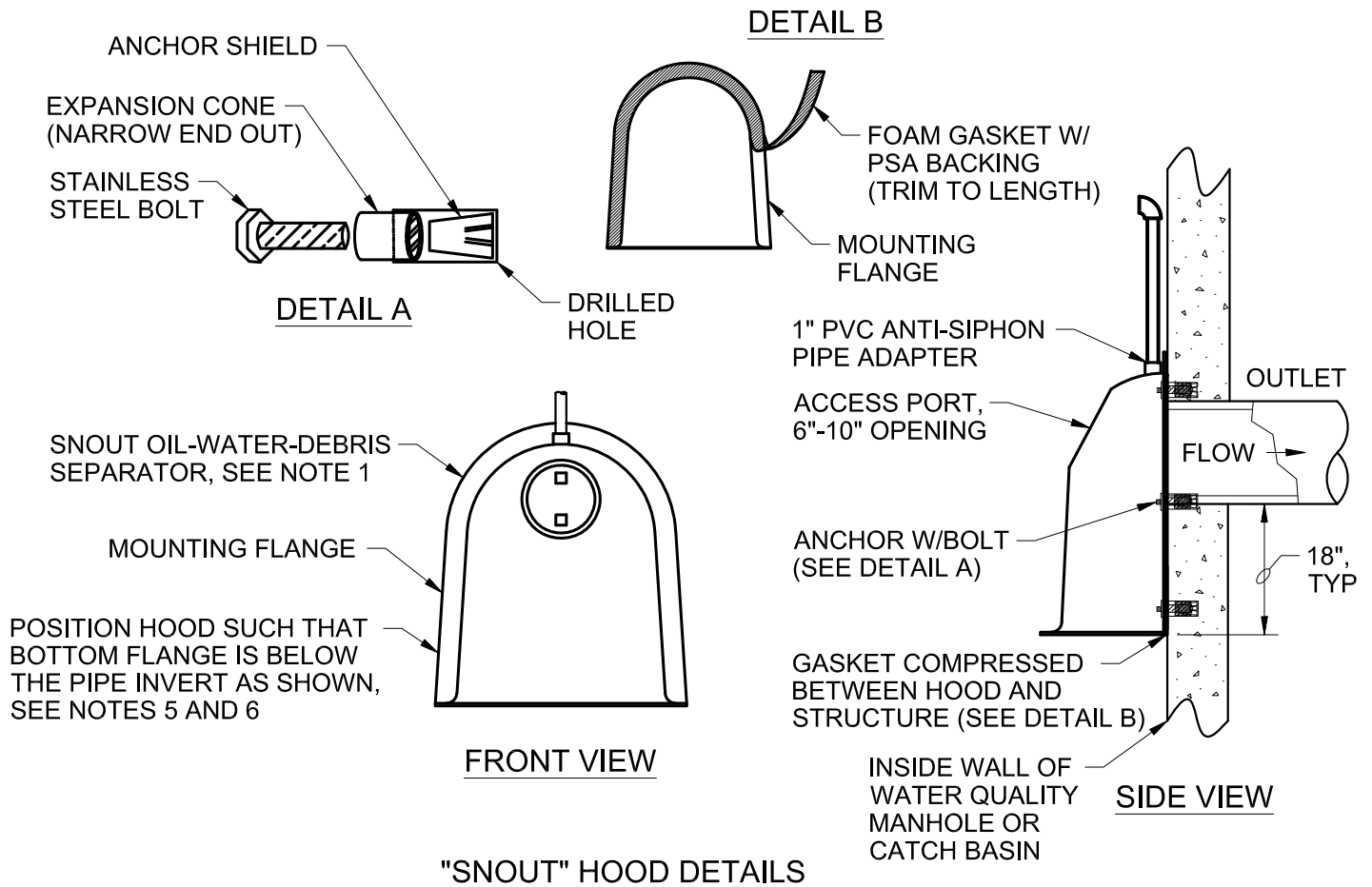
612



NOTES:


1. MANUFACTURED ALTERNATIVES TO THIS POLLUTION CONTROL BOX MAY BE ALLOWED WHERE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. 6" THREADED PLUG SHALL BE HEAVY DUTY CAST METAL.
3. ALL ANCHORS AND FASTENERS SHALL BE STAINLESS STEEL, EPOXY TYPE RED HEAD, OR APPROVED EQUAL.
4. AFTER FABRICATION, CONTROL BOX SHALL BE COATED WITH CORROSION-RESISTANT EPOXY COATING TNE MEC SERIES 46H-413, OR APPROVED EQUAL SUITABLE FOR SUBMERGED APPLICATIONS. APPLY COATING PER MANUFACTURER'S RECOMMENDATION.
5. CONTROL BOX SHOULD BE CENTERED HORIZONTALLY OVER OUTLET PIPE AND SHALL BE LOCATED 6" MIN BELOW OUTLET PIPE INVERT, AS SHOWN. ADJUST CONTROL BOX LENGTH AND WIDTH ACCORDINGLY TO MAINTAIN DIMENSIONS SHOWN FOR PIPES LARGER THAN 12".

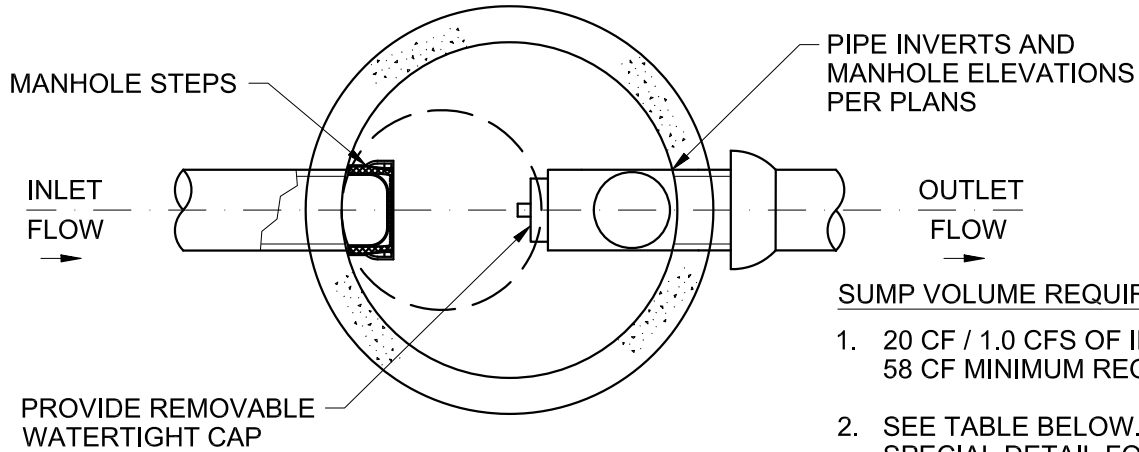
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	REVIEWED BY	<h2 style="margin: 0;">POLLUTION CONTROL BOX</h2>		DIVISION
	JTA / LSL 09/21			STORM
	NAME DATE			DRAWING NO.
REVISIONS			614	



NOTES:

1. ALL HOODS AND TRAPS FOR WATER QUALITY MANHOLES AND CATCH BASINS SHALL BE AS MANUFACTURED BY BMP, INC. (SEE WWW.BMPINC.COM), OR APPROVED EQUAL, AND SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
2. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS SHOWN.
3. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
4. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE OF 18" FROM THE OUTLET PIPE INVERT AS SHOWN.
5. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY A MINIMUM OF 6" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
6. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
7. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER.
8. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. THE INSTALLATION KIT SHALL AT MINIMUM INCLUDE; 1) INSTALLATION INSTRUCTIONS, 2) PVC ANTI-SIPHON VENT PIPE AND ADAPTER, 3) OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING, 4) 3/8" STAINLESS STEEL BOLTS, 5) ANCHOR SHIELDS, 6) OTHER ITEMS AS REQUIRED BY MANUFACTURER.

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	<p>REVISIONS</p>		<p>DIVISION</p> <p>STORM</p>
			<p>DRAWING NO.</p> <p>616</p>



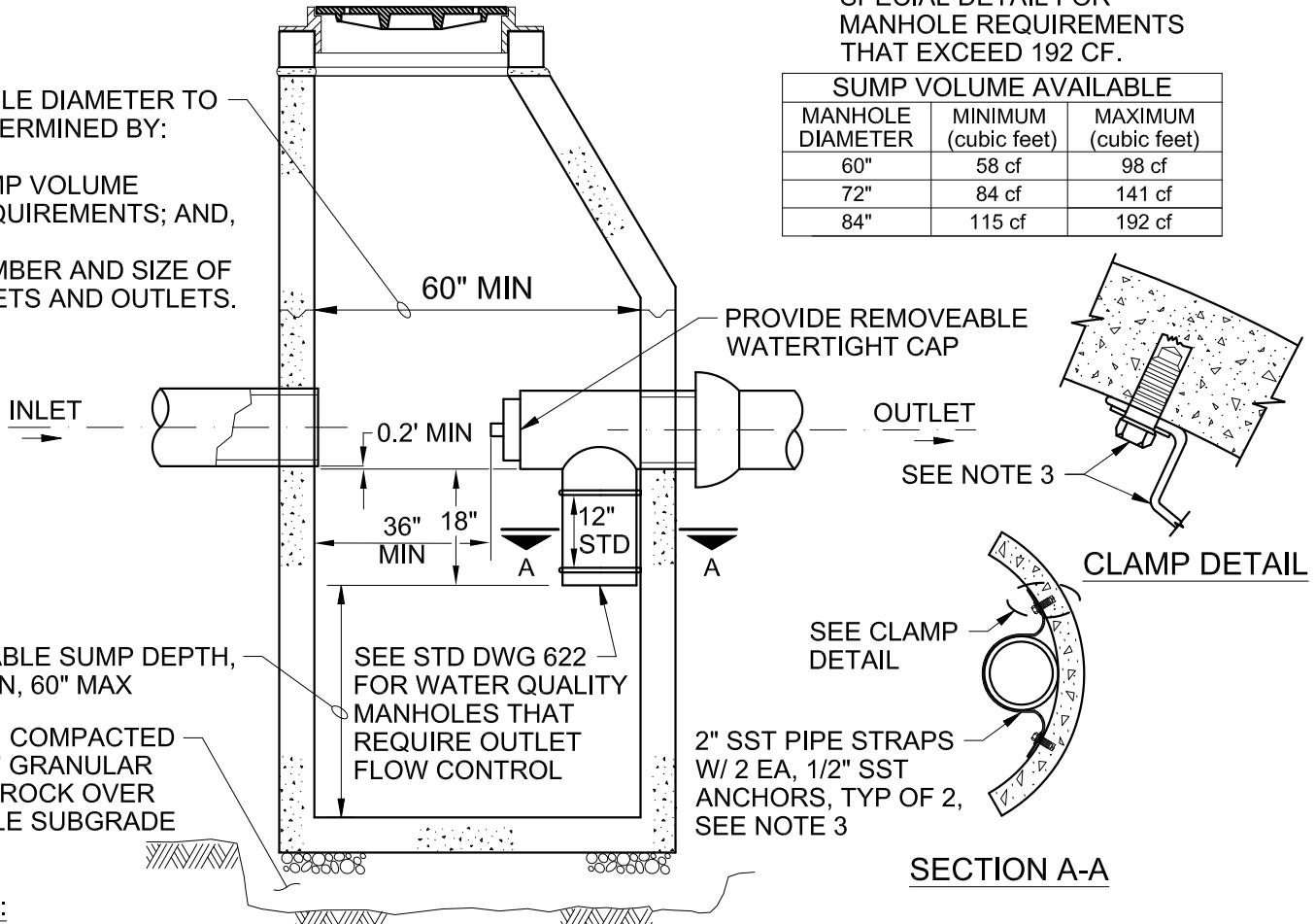
SUMP VOLUME REQUIREMENTS

1. 20 CF / 1.0 CFS OF INFLOW, 58 CF MINIMUM REQUIRED.
2. SEE TABLE BELOW. PROVIDE SPECIAL DETAIL FOR MANHOLE REQUIREMENTS THAT EXCEED 192 CF.

SUMP VOLUME AVAILABLE		
MANHOLE DIAMETER	MINIMUM (cubic feet)	MAXIMUM (cubic feet)
60"	58 cf	98 cf
72"	84 cf	141 cf
84"	115 cf	192 cf

MANHOLE DIAMETER TO BE DETERMINED BY:

1. SUMP VOLUME REQUIREMENTS; AND,
2. NUMBER AND SIZE OF INLETS AND OUTLETS.



SEE CLAMP DETAIL

2" SST PIPE STRAPS W/ 2 EA, 1/2" SST ANCHORS, TYP OF 2, SEE NOTE 3

SECTION A-A


VARIABLE SUMP DEPTH, 36" MIN, 60" MAX

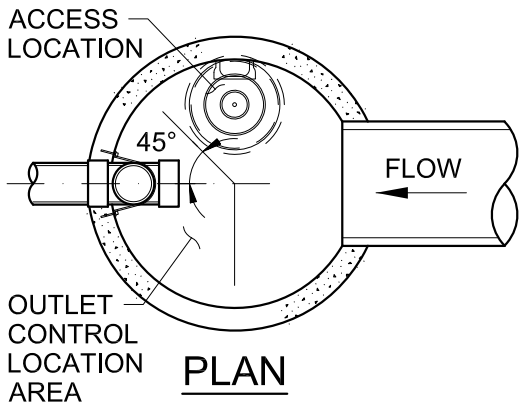
6" MIN COMPACTED 3/4"-0" GRANULAR BASE ROCK OVER STABLE SUBGRADE

SEE STD DWG 622 FOR WATER QUALITY MANHOLES THAT REQUIRE OUTLET FLOW CONTROL

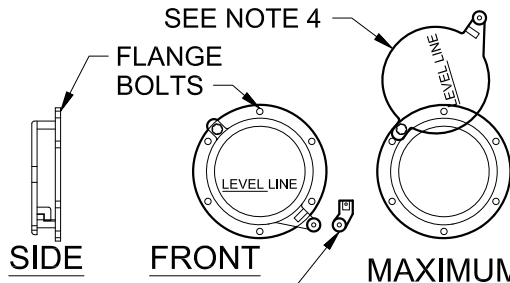
NOTES:

1. A WATER QUALITY MANHOLE SHALL BE LOCATED UPSTREAM OF VEGETATED STORMWATER FACILITIES AND AS DIRECTED BY THE CITY ENGINEER. MANHOLES SHALL CONFORM TO REQUIREMENTS OF ASTM C-478. SEE STANDARD DRAWING 502 FOR STANDARD MANHOLE DETAILS. ALL OPENINGS SHALL BE CORE DRILLED. PROVIDE FLEXIBLE MANHOLE TO PIPE CONNECTION, KOR-N-SEAL OR APPROVED EQUAL.
2. MAXIMUM INLET AND OUTLET PIPE SHALL BE 18" DIAMETER. PROVIDE SPECIAL DETAIL FOR ALL PIPES EXCEEDING 18" DIAMETER. ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, AND UNRESTRAINED JOINT WITHIN 18" OF MANHOLE.
3. PIPES SHALL BE ANCHORED TO WALL WITH SST RISER CLAMPS OR 2" SST BANDS AS SHOWN. 1/2" SELF TAPPING CONCRETE ANCHOR, PHILLIPS 5-12 OR APPROVED EQUAL. PROVIDE 1/2" x 1-1/2" SST BOLT.

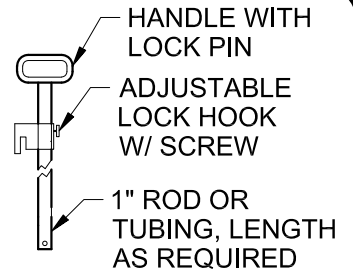
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	<p>REVISIONS</p>		



PLAN



SHEAR GATE



LIFT HANDLE

LIFT HANDLE SHALL BE ATTACHED PER MANUFACTURER'S RECOMMENDATIONS

STANDARD MANHOLE FRAME AND COVER OR TAMPERPROOF, SEE STD DWGS 516 AND 518

FRAME AND RISER RINGS SHALL BE SEALED WITH NON-SHRINK GROUT

FINISH GRADE

STANDARD MANHOLE FLAT TOP SLAB, 72" DIA. MINIMUM

STANDARD PRECAST MANHOLE RISERS AS REQUIRED. VARIABLE LENGTH

ALL INSIDE JOINTS AND WALL PENETRATIONS SHALL BE GROUTED WITH NON-SHRINK GROUT FOLLOWING MH ASSEMBLY, TYP

2" SST PIPE STRAPS W/ 2 EA, 1/2" SST ANCHORS, TYP OF 3

12" MIN MAX WSE, SEE STD DWG 624
6" MIN FREEBOARD
NORMAL WSE

12" THRU 18" ASTM D 3034 SDR 35 PVC CROSS, 18" MAX DIAMETER FOR 72" DIAMETER MANHOLE

INLET PIPE, TYP. SEE STD DWG 624 FOR DETENTION PIPE INLET DETAILS

ALL OPENINGS SHALL BE CORE DRILLED, SEE NOTE 1

12" MIN DIAMETER SHEAR GATE WITH LIFT HOOK, ATTACH TO CROSS AND EXTEND HOOK TO TOP STEP, SEE NOTE 4


PVC CAP WITH ORIFICE. DIAMETER PER PLANS, 1-1/2" MIN

PIPE STUB, 8" MIN

6" MIN THICK COMPACTED 3/4" GRANULAR BASE ROCK OVER STABLE SUBGRADE

NOTES:

- MANHOLE SHALL CONFORM TO REQUIREMENTS OF ASTM C-478. SEE STANDARD DRAWING 502 FOR STANDARD MANHOLES DETAILS. ALL OPENINGS SHALL BE CORE DRILLED. PROVIDE FLEXIBLE MANHOLE TO PIPE CONNECTION, KOR-N-SEAL OR APPROVED EQUAL.
- PRECAST FLAT TOP MANHOLE SHALL BE MINIMUM 72" DIAMETER. MAXIMUM OUTLET PIPE SHALL BE 18" DIAMETER FOR A 72" DIAMETER MANHOLE.
- ALL RIGID CONNECTING PIPES SHALL HAVE FLEXIBLE, GASKETED, AND UNRESTRAINED JOINT WITHIN 18".
- SHEAR GATE AND LIFT HANDLE SHALL BE ALUMINUM ALLOY PER ASTM B-26 AND ASTM B-275, DESIGNATION ZG32A. LIFT HANDLE SHALL BE EITHER SOLID OR TUBING WITH ADJUSTABLE HOOK. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE STAINLESS STEEL. ALTERNATE SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS. SHEAR GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITING THE HINGE MOVEMENT, STOP TAB, OR SOME OTHER APPROVED DEVICE.



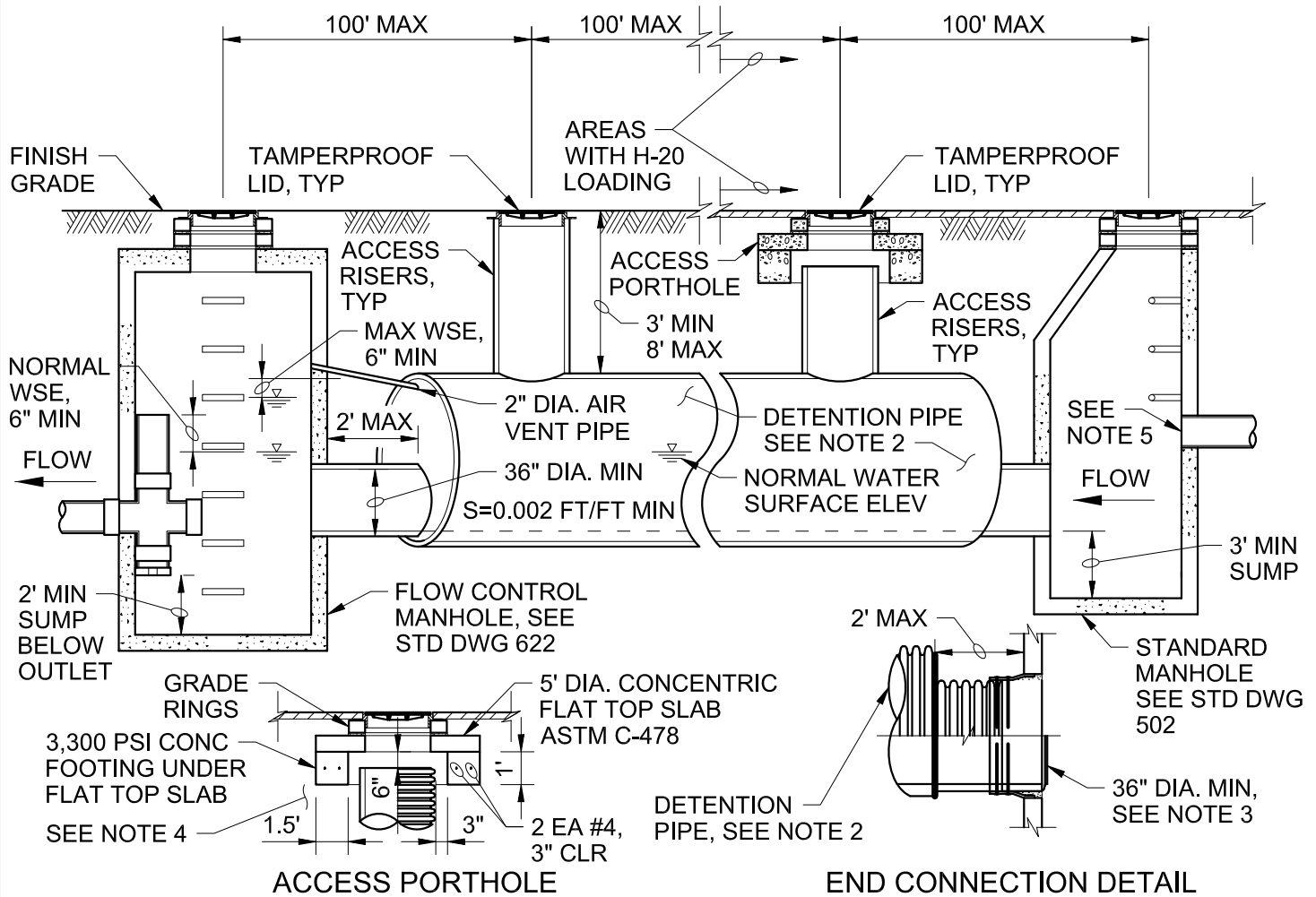
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STANDARD DRAWING TITLE

**STORM DRAIN
FLOW CONTROL
MANHOLE**

NO SCALE
DIVISION
STORM
DRAWING NO.
622




ACCESS PORTHOLE

END CONNECTION DETAIL

NOTES:

1. THIS STANDARD DRAWING REPRESENTS A TYPICAL DETENTION PIPE DESIGN. FINAL DESIGN MAY VARY DEPENDING ON ACTUAL SITE CONDITIONS AND SHALL BE AS APPROVED BY THE CITY ENGINEER. VARIABLE LOADING CALCULATIONS SHALL BE MADE AVAILABLE TO THE CITY ENGINEER FOR REVIEW IN AREAS THAT ARE SUBJECT TO VEHICLE LOADING.
2. DETENTION PIPES LOCATED WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENTS SHALL BE MINIMUM 48" DIAMETER AND SHALL BE CLASS IV REINFORCED CONCRETE OR SOLID WALL HDPE (DR 18) PIPE. SEE STORMWATER DESIGN STANDARDS FOR ALLOWED ALTERNATIVES FOR PRIVATE STORMWATER DETENTION PIPES. ALL DETENTION PIPES SHALL BE WATERTIGHT.
3. END CONNECTIONS SHALL BE MINIMUM 36" DIAMETER, NO LONGER THAN 2' IN LENGTH, AND SHALL BE MANUFACTURED OF THE SAME MATERIAL AS THE DETENTION PIPE. END CONNECTIONS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AS APPROVED BY CITY ENGINEER.
4. ACCESS RISERS SHALL BE 30" DIAMETER, SHALL BE OF THE SAME MATERIAL AS THE DETENTION PIPE, AND SHALL BE CONNECTED TO DETENTION PIPE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ACCESS RISERS SUBJECT TO TRAFFIC LOADING SHALL HAVE AN ACCESS RISER PORTHOLE SUPPORTED BY 3/4" GRANULAR BASE ROCK COMPACTED TO 95 PERCENT PER AASHTO T-180, CDF BACKFILL, OR CONCRETE, PER DETENTION PIPE MANUFACTURER'S RECOMMENDATIONS.
5. LATERAL CONNECTIONS SHALL BE MADE ABOVE THE NORMAL WATER SURFACE ELEVATION. DIRECT CONNECTIONS TO DETENTION PIPE SHALL BE WITH MANUFACTURED FITTINGS AND SHALL BE COMPATIBLE WITH TYPE OF DETENTION PIPE AND STORM DRAIN PIPE BEING USED. ALL CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

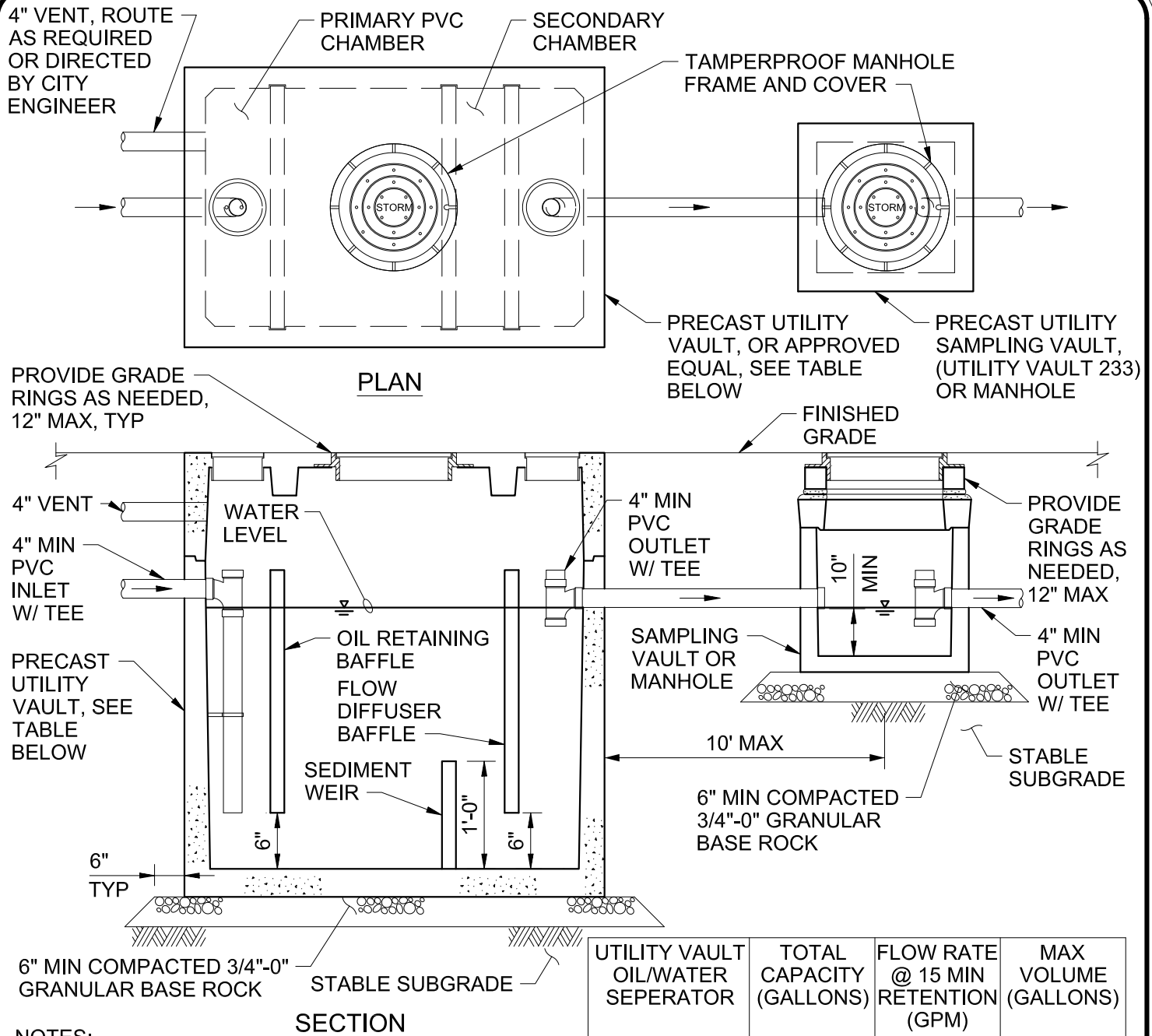


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STANDARD DRAWING TITLE
TYPICAL UNDERGROUND DETENTION PIPE


NO SCALE
DIVISION
STORM
DRAWING NO.
624



UTILITY VAULT OIL/WATER SEPERATOR	TOTAL CAPACITY (GALLONS)	FLOW RATE @ 15 MIN RETENTION (GPM)	MAX VOLUME (GALLONS)
660-SA	550	37	275
576-SA	1,000	67	500
5106-2-SA	2,100	140	1,050
612-2-SA	3,100	207	1,550
816-SA	5,000	333	2,500

NOTES:

- SEPARATOR AND BAFFLE DIVIDER WALL SHALL BE PRECAST CONCRETE, AS MANUFACTURED BY UTILITY VAULT OR APPROVED EQUAL. OIL/WATER SEPARATORS 5,000 GALLONS OR LARGER SHALL BE SUPPLIED WITH 6" PVC PIPING.
- SEPARATOR, INSTALLATION, AND MAINTENANCE SHALL COMPLY WITH THE OREGON PLUMBING SPECIALTY CODE AND APPLICABLE PROVISIONS OF THE STAYTON MUNICIPAL CODE. TOTAL CAPACITY OF SEPARATOR SHALL NOT BE LESS THAN 550 GALLONS.
- SEPARATOR SHALL BE WATERTIGHT AND MUST BE VENTED AT ALL TIMES. SEPARATOR SHALL BE CAPABLE OF SUPPORTING H-20 TRAFFIC LOADING.
- SEPARATOR SHALL BE FILLED WITH CLEAN WATER AFTER INSTALLATION AND PRIOR TO USE.



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STANDARD DRAWING TITLE

SAND AND OIL/WATER SEPARATOR

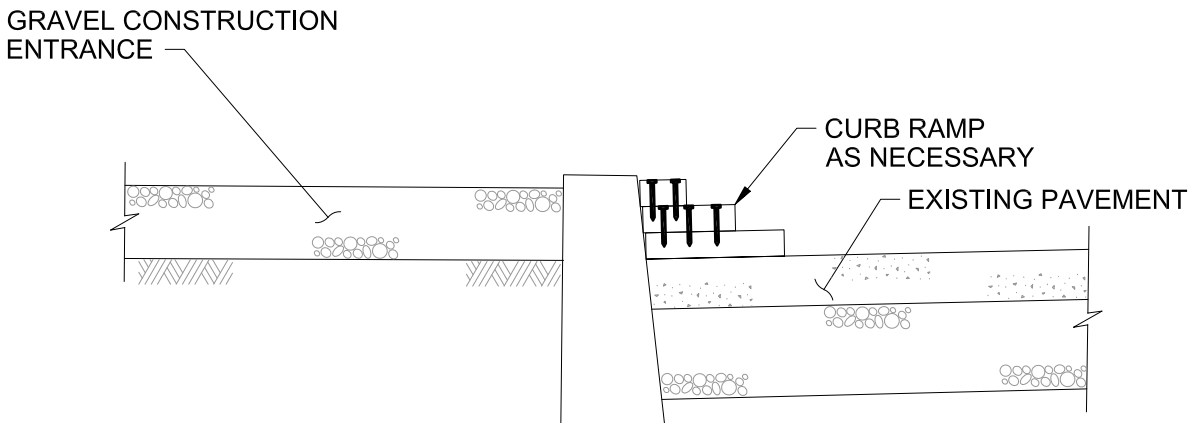
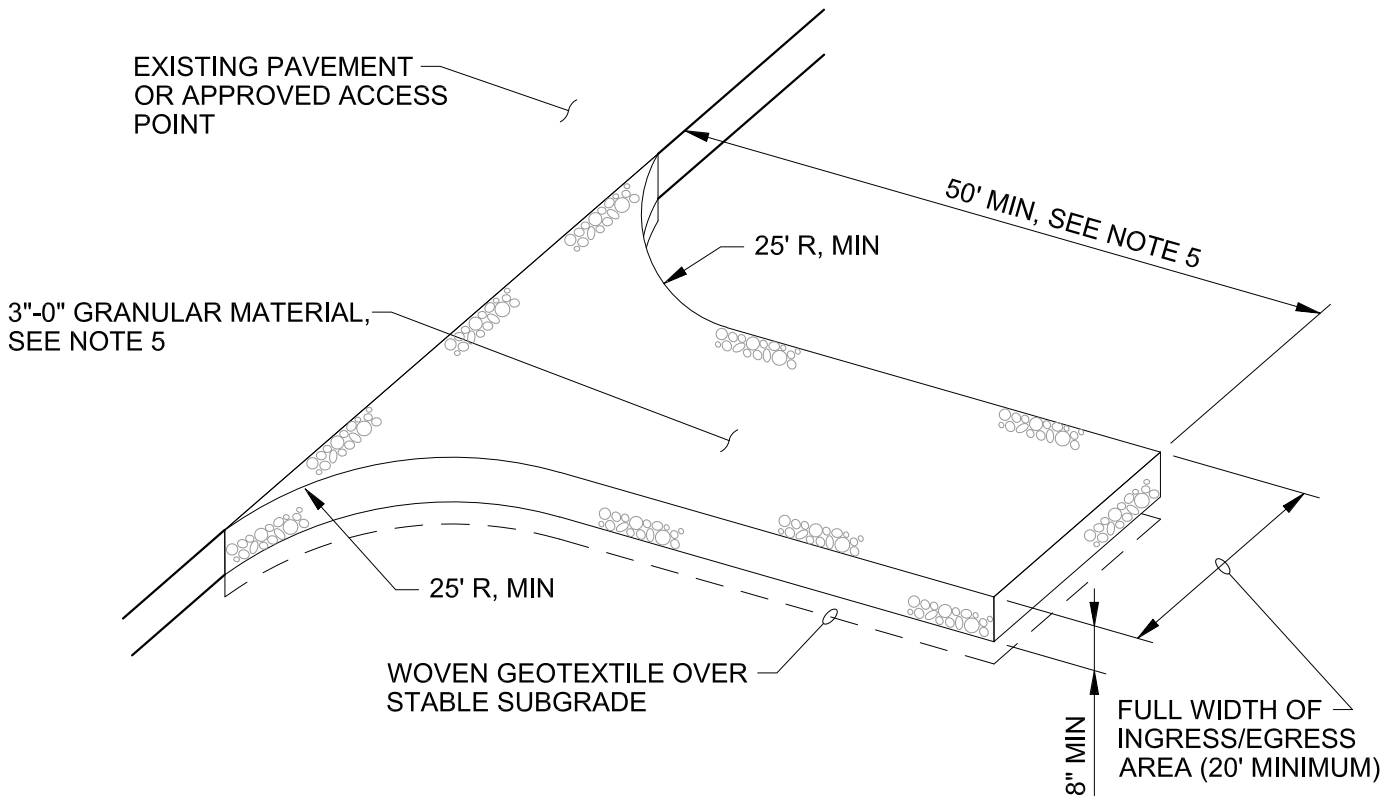
NO SCALE

DIVISION

STORM


DRAWING NO.

626



NOTES:

1. THE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. FOR SINGLE FAMILY RESIDENCES, PROVIDE 20' LONG CONSTRUCTION ENTRANCE WITH 8" MIN DEEP OF 1"-0" CLEAN ROCK.



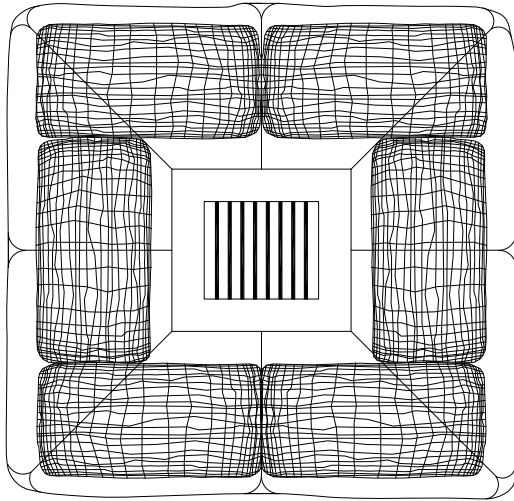
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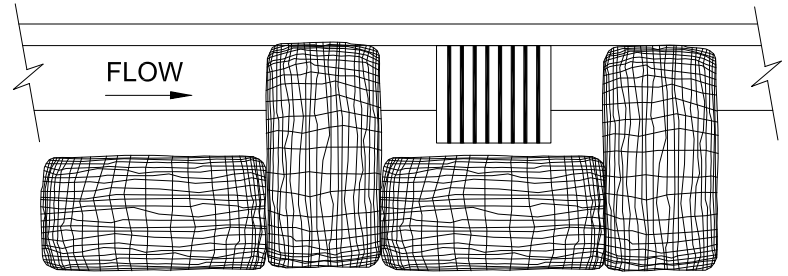
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GRAVEL CONSTRUCTION ENTRANCE

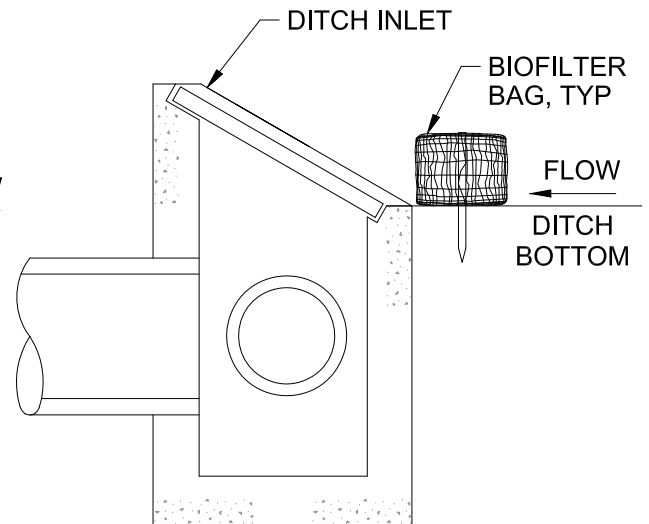
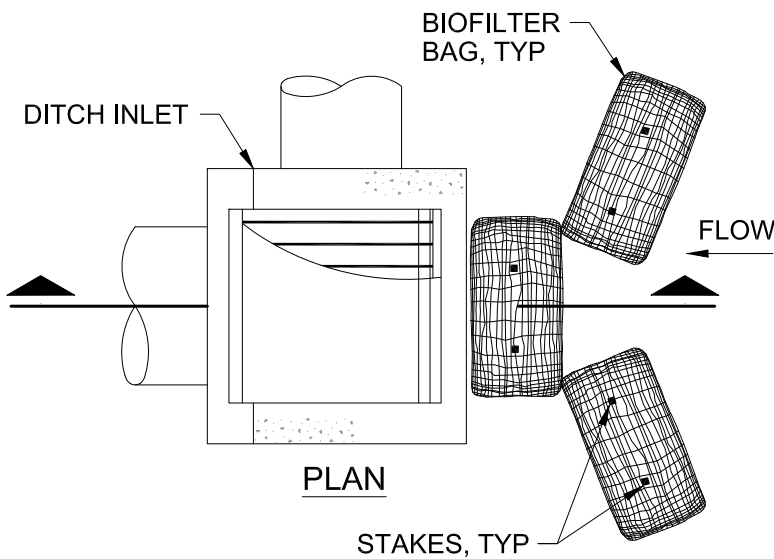
NO SCALE
DIVISION
ESC
DRAWING NO.
702



AREA DRAIN
OR FIELD INLET



SIDE-INLET CATCH BASIN



SECTION

DITCH INLET

NOTES:

1. USE 2 STAKES PER BAG. STAKES MAY BE OMITTED IF BAGS ARE PLACED ON PAVEMENT OR GRAVEL SURFACE.
2. OVERLAP ALL BAG JOINTS 6".
3. REPLACE BIOFLITER BAGS WITH FILTER FABRIC INLET BARRIER AFTER FIRST LIFT OF ASPHALT.



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**BIOFILTER BAG
INLET PROTECTION**

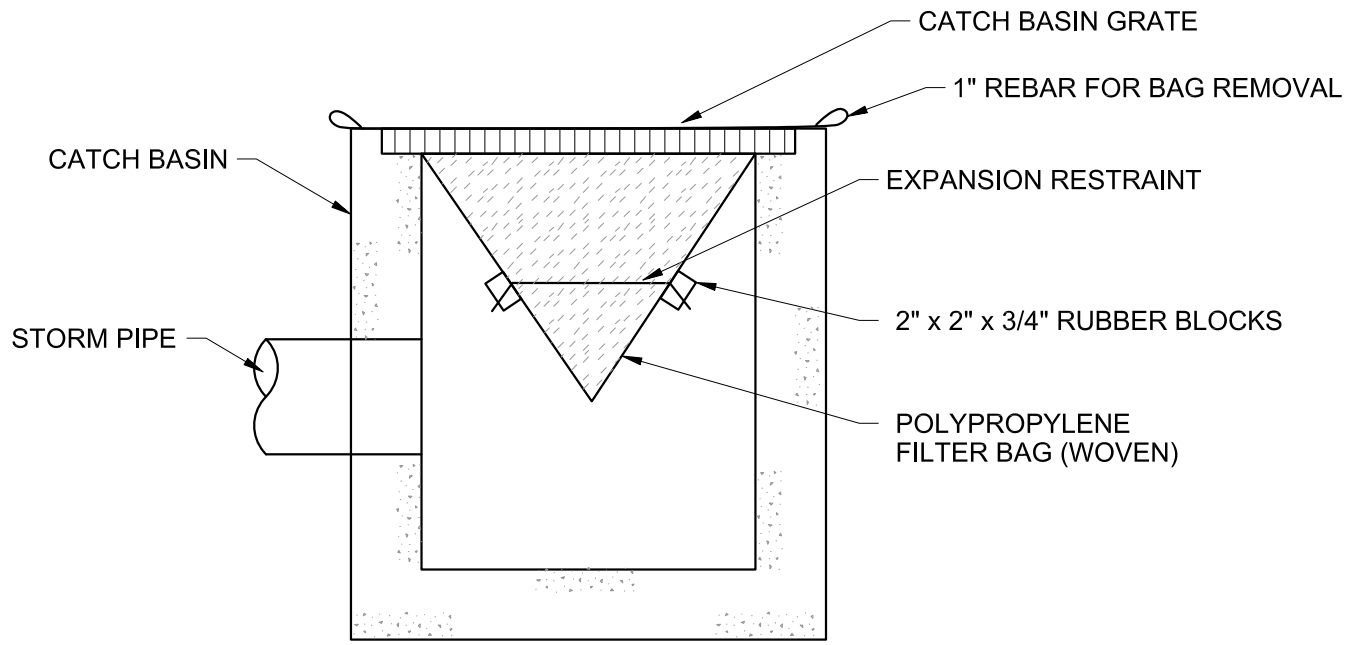
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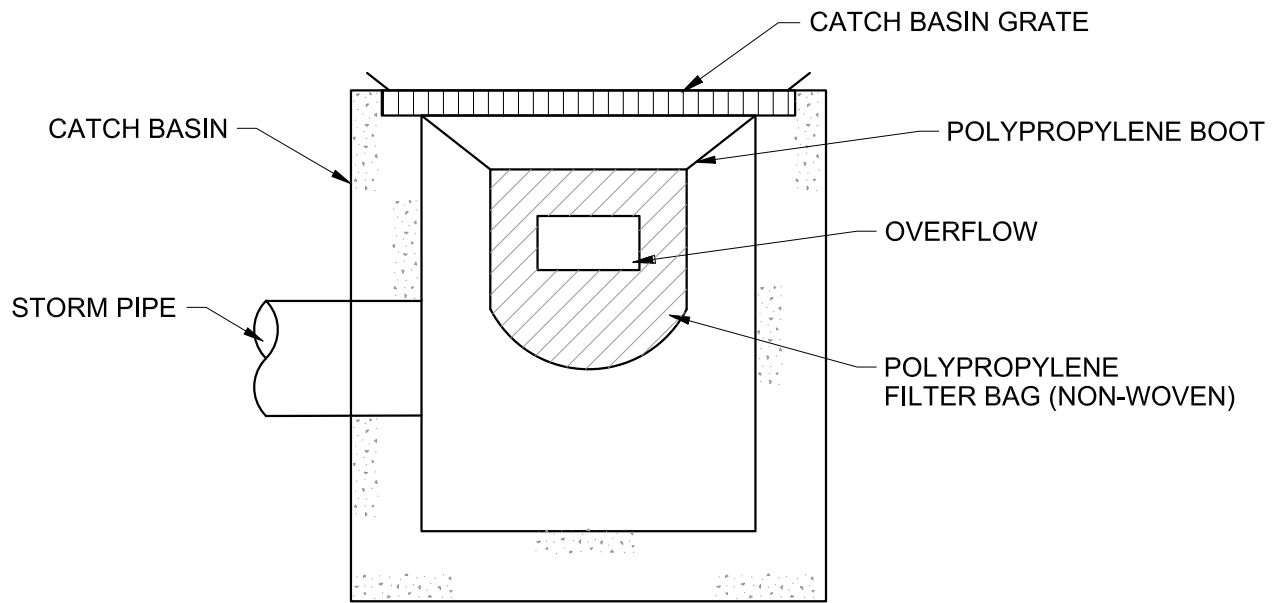
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DRAWING NO.

704




WOVEN POLYPROPYLENE BAG



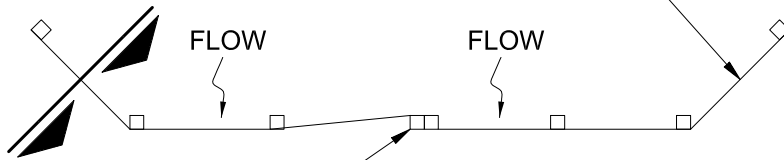
NON-WOVEN POLYPROPYLENE BAG

NOTES:

1. RECESSED CURB AND SIDE-INLETS MUST BE BLOCKED WHEN USING POLYPROPYLENE INLET BAGS.
2. SIZE OF POLYPROPYLENE FILTER BAGS TO BE DETERMINED BY MANUFACTURER.

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	<p>REVIEWED BY</p>	<p>JTA / LSL 09/21</p>	<p>POLYPROPYLENE BAG INLET PROTECTION</p>	<p>DIVISION</p>
	<p>NAME DATE</p>	<p>ESC</p>		
	<p>REVISIONS</p>	<p>REVISIONS</p>	<p>DRAWING NO.</p>	<p>706</p>

ANGLE BOTH ENDS OF FILTER FABRIC FENCE TO ASSURE SOIL IS TRAPPED



CONNECT END OF ROLLS BY POST SPACING OVERLAP OR TURNED ENDS, SEE END CONNECTION DETAIL

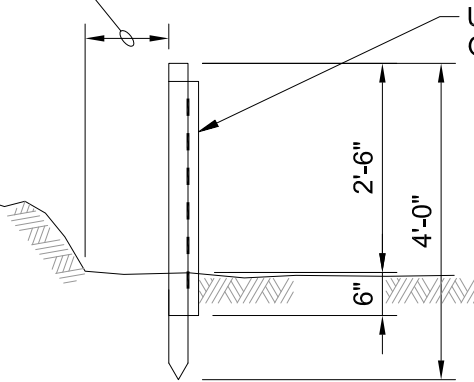
PLAN

BARRIER SPACING FOR GENERAL APPLICATION

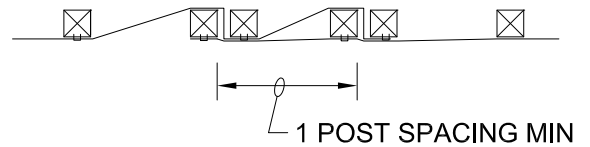
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE (V:H)	MAX SPACING ON SLOPE
10% FLATTER	1:10 OR FLATTER	300'
10% TO 15%	1:10 TO 1:7.5	150'
15% TO 20%	1:7.5 TO 1:5	100'
20% TO 30%	1:5 TO 1:3	50'
30% OR MORE	1:3 OR STEEPER	25'

3' MINIMUM FROM TOE OF SLOPE

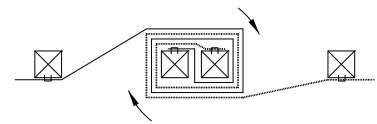
NEWLY GRADED OR DISTURBED SLOPE, SEE TABLE



USE STICHED LOOPS OVER 2" x 2" POSTS



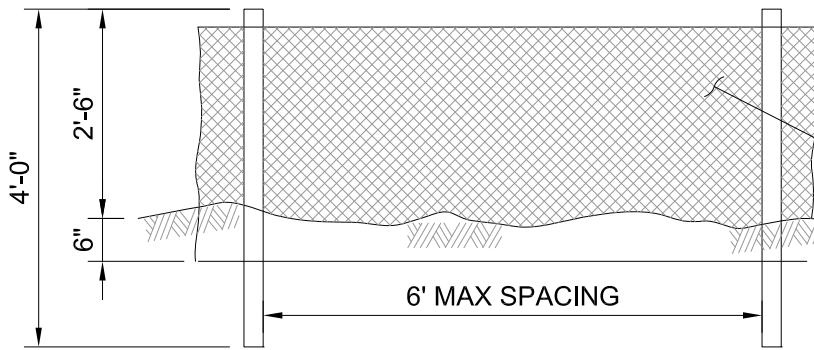
POST SPACING OVERLAP



SECTION

TURNED ENDS

END CONNECTIONS



FILTER FABRIC MATERIAL
36" WIDE ROLLS

ELEVATION

NOTES:

1. BOTTOM OF FILTER FABRIC SHALL BE BURIED 6" VERTICALLY BELOW FINISHED GRADE AND BACKFILLED WITH NATIVE BACKFILL MATERIAL.
2. POSTS SHALL BE 2" x 2" FIR, PINE, OR STEEL FENCE POSTS.
3. POSTS AND STICHED LOOPS SHALL BE INSTALLED ON THE UPHILL SIDE OF THE SLOPE AS SHOWN.
4. AREAS OF FILTER FABRIC TRENCH SHALL BE COMPACTED.



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SEDIMENT FENCE

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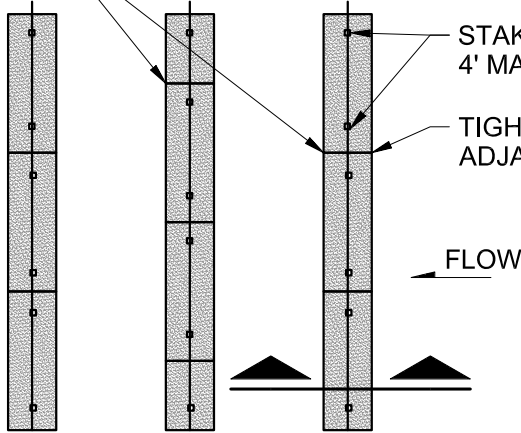
DIVISION

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DRAWING NO.

708

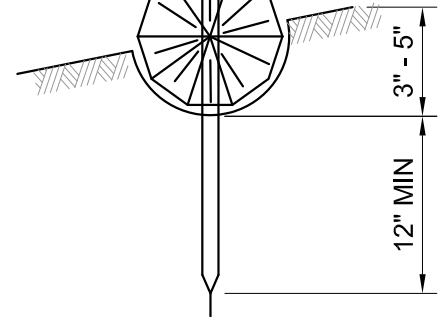
STAGGER JOINTS



PLAN

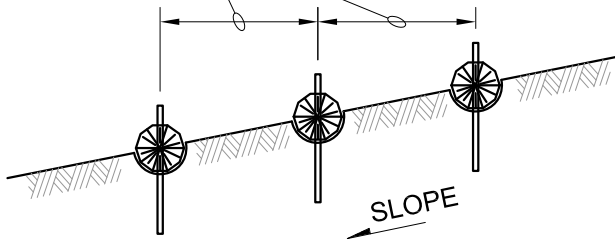
STAKE

8" MIN DIA. STRAW WATTLES



SECTION

BARRIER SPACING, SEE TABLE



ELEVATION

BARRIER SPACING FOR GENERAL APPLICATION

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE (V:H)	MAX SPACING ON SLOPE
10% FLATTER	1:10 OR FLATTER	300'
10% TO 15%	1:10 TO 1:7.5	150'
15% TO 20%	1:7.5 TO 1:5	100'
20% TO 30%	1:5 TO 1:3	50'
30% OR MORE	1:3 OR STEEPER	25'

NOTES:

1. STAKING SHALL BE WITH 1" x 2" WOODEN STAKES OR APPROVED EQUAL.
2. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPES OR HIGHLY EROSIIVE SOILS.



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STRAW WATTLES

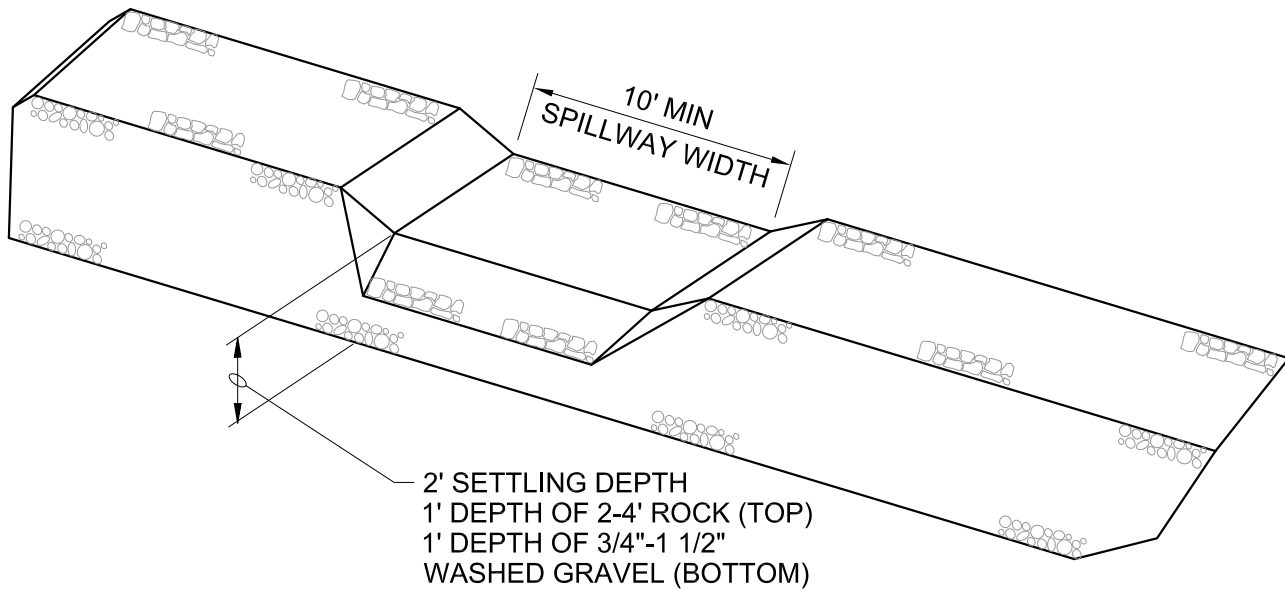
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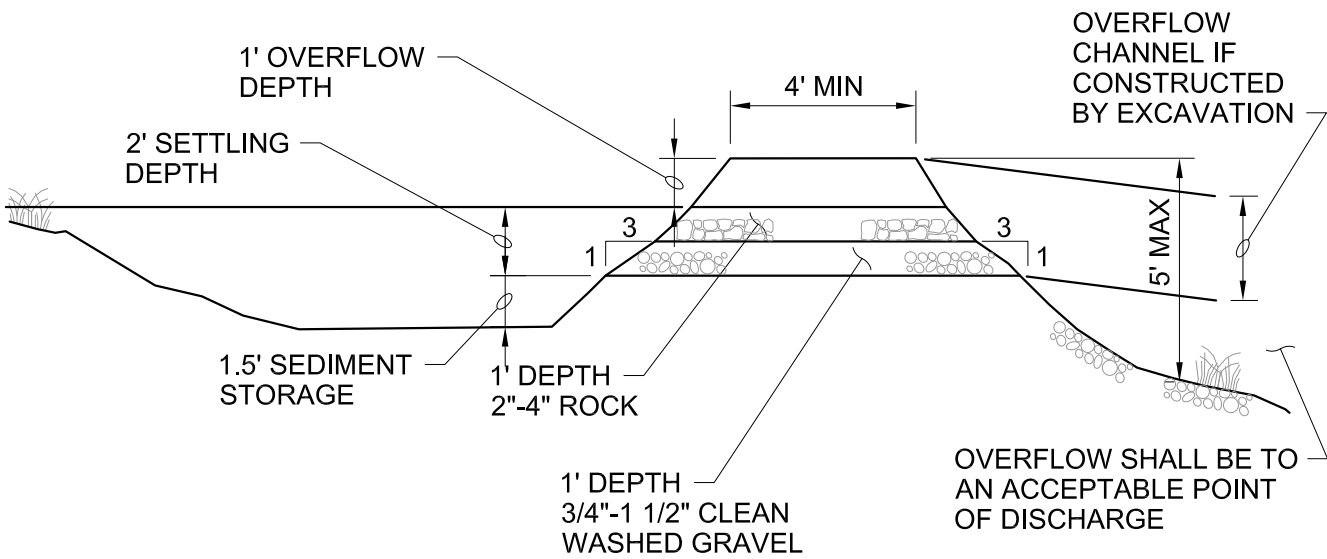
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710



OVERFLOW



SECTION

NOTE:

1. A SEDIMENT FENCE OR SIMILAR FILTER MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE SEDIMENT TRAP PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.



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SEDIMENT TRAP

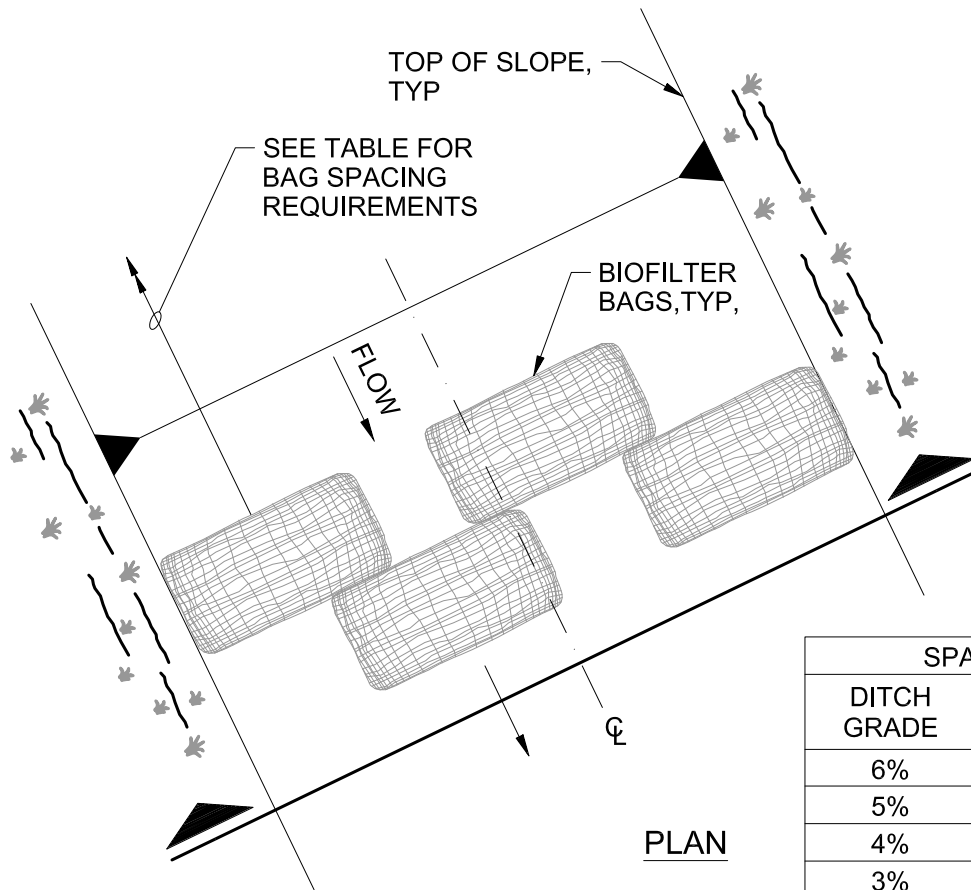
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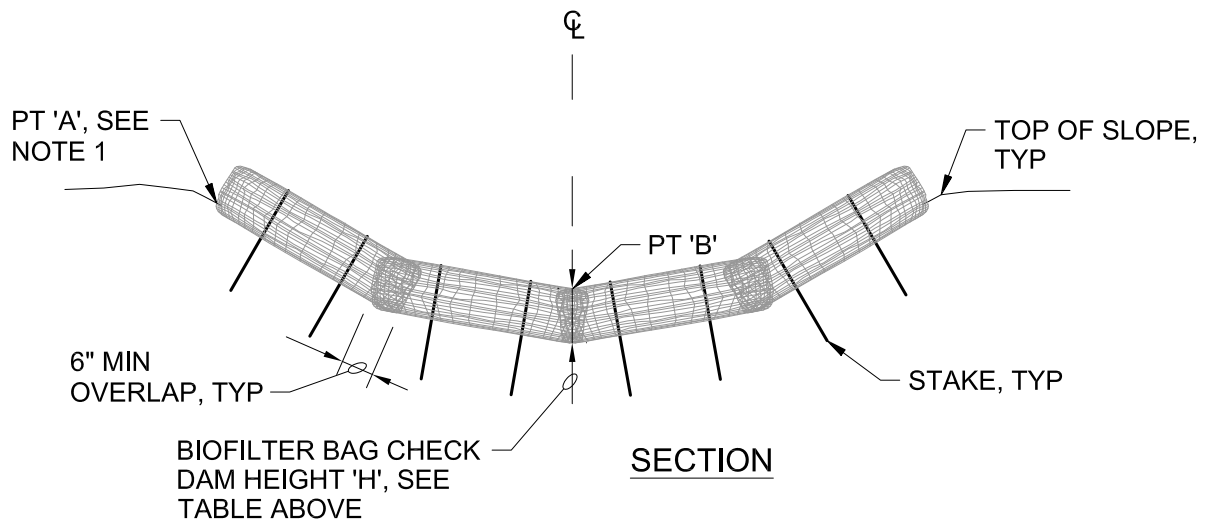
DRAWING NO.

712



PLAN

SPACING FOR CHECK DAMS		
DITCH GRADE	'H' = 6-INCH	'H' = 12-INCH
6%	NOT ALLOWED	16'
5%	NOT ALLOWED	20'
4%	NOT ALLOWED	26'
3%	15'	33'
2%	25'	50'



SECTION

NOTES:

1. POINT 'A' MUST BE 6" MINIMUM HIGHER THAN PT 'B'.
2. STAKING OF BIOFILTER BAGS IS REQUIRED USING 2 EACH 1" x 2" LONG WOOD STAKES OR APPROVED EQUAL PER BIOFILTER BAG.
3. DRIVE STAKES MINIMUM 12" INTO GROUND AND FLUSH WITH TOP OF BIOFILTER BAG.
4. EMBED BIOFILTER BAGS MINIMUM OF 4" INTO GROUND SURFACE.



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**BIOFILTER BAG
CHECK DAMS**

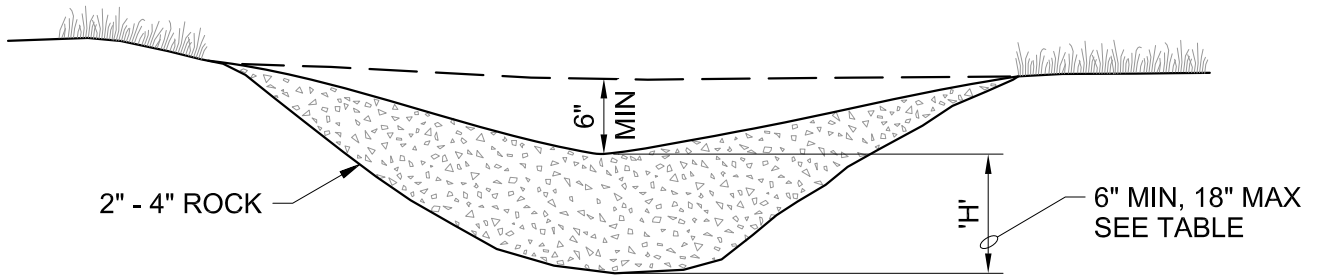
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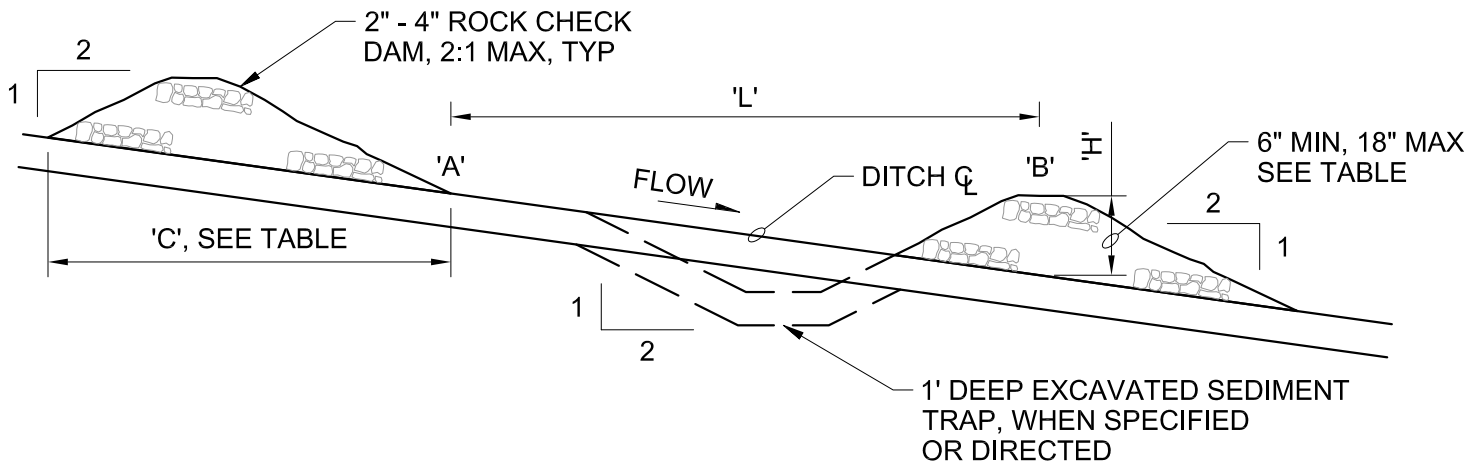
DRAWING NO.

714



ROCK CHECK DAM

'L' = SPACING FOR CHECK DAMS ALONG DITCH			
DITCH GRADE	'H' = 6-INCH 'C' = 3' MIN	'H' = 12-INCH 'C' = 4' MIN	'H' = 18-INCH 'C' = 4' MIN
6%	NOT ALLOWED	16'	26'
5%	NOT ALLOWED	20'	30'
4%	NOT ALLOWED	26'	40'
3%	15'	33'	50'
2%	25'	50'	80'



SPACING BETWEEN ROCK CHECK DAMS

NOTES:

- 'L' IS THE SPACING ALONG SWALE OR DITCH SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION. SEE TABLE FOR CHECK DAM SPACING AND HEIGHT REQUIREMENTS BASED ON SWALE OR DITCH GRADE.
- ANY SEDIMENT DEPOSITION OF MORE THAN 6-INCHES HIGH SHALL BE REMOVED SO THAT THE SWALE OR DITCH IS RESTORED TO ITS ORIGINAL DESIGN CAPACITY.
- THE SWALE OR DITCH SHALL BE EXAMINED FOR SIGNS OF SCOURING AND EROSION OF THE BED AND BANKS. IF SCOURING OR EROSION HAS OCCURRED, AFFECTED AREAS SHALL BE PROTECTED BY RIPRAP OR ANY EROSION CONTROL BLANKET OR NET.



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ROCK CHECK DAMS

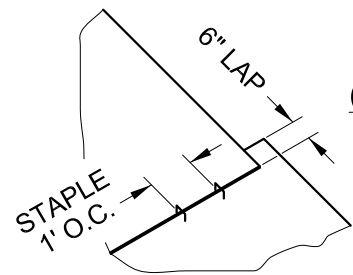
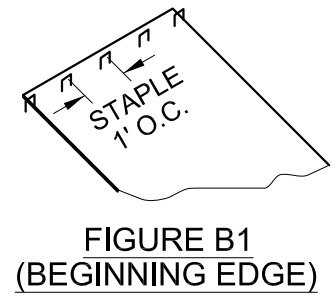
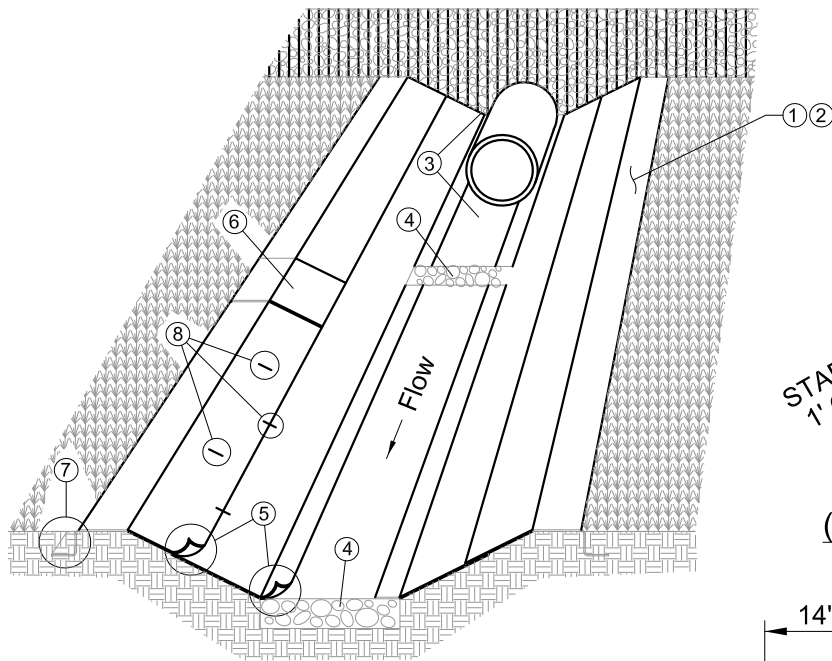
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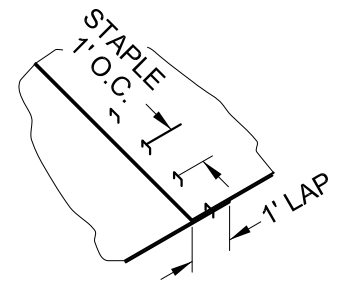
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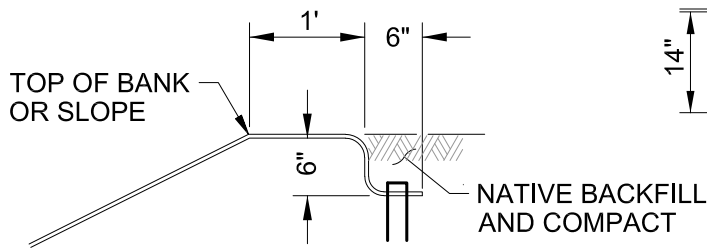


**FIGURE B1
(BEGINNING EDGE)**

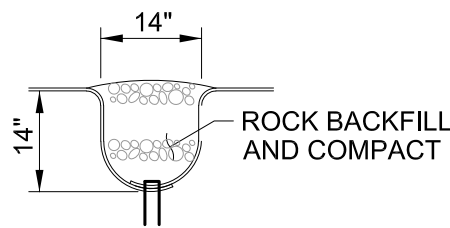
**FIGURE B2
(EDGE LAPS)**



**FIGURE B3
(END LAPS)**



**FIGURE A1
(EDGE ANCHOR)**



**FIGURE A2
(CHECK SLOT)**

NOTES:

1. INFORMATION SHOWN IS MINIMUM CRITERIA FOR MATTING INSTALLATION. ALL MANUFACTURER'S RECOMMENDATIONS WHICH ARE MORE STRINGENT MUST BE APPLIED. STAPLES IN COHESIVE SOILS SHALL HAVE A 6" STAPLE LENGTH AND IN NON-COHESIVE SOILS SHALL HAVE A 12" STAPLE LENGTH.
2. AREA SHALL BE PREPARED BY REMOVING ALL MATERIALS (VEGETATION, ROCKS, WOOD, ETC.) LARGER THAN 2" IN SIZE. APPLY FERTILIZER AND SEED PRIOR TO MATTING INSTALLATION. PLACE MATTING LOOSELY AND IN FULL CONTACT WITH THE SOIL.
3. INSTALL MAT IN CENTER OF CHANNEL IN THE DIRECTION OF WATER FLOW. ANCHOR UPSTREAM END OF MAT WITH CHECK SLOT (FIG. B1 & A2). BACKFILL CHECK SLOT WITH ROCK. FOR CULVERT OUTFALLS, PLACE MAT UNDER PIPE 1' MINIMUM UPSTREAM FROM PIPE OUTLET.
4. CONSTRUCT CHECK SLOTS ACROSS CHANNEL BOTTOM AT 50' SPACINGS AND AT THE END OF EACH MAT (FIG. A2). STAPLE MAT AT BOTTOM OF CHECK SLOT (FIG. A2 & B1). BACKFILL CHECK SLOT WITH ROCK.
5. OVERLAP SIDE CHANNEL MAT EDGES 6" OVER THE CENTER CHANNEL MAT AND STAPLE EDGES 1' O.C. (FIG. B2). CONTINUE OVERLAP AND STAPLING PATTERN FOR EACH ADDITIONAL SIDE MAT.
6. LAP UPSTREAM MAT END 1' OVER BEGINNING EDGE OF DOWNSTREAM MAT. STAPLE 1' O.C. (FIG. B3).
7. ANCHOR TOP EDGE OF SIDE CHANNEL MATS IN TRENCH AND STAPLE 1' O.C. (FIG. A1 & B1)
8. STAPLE MAT INTERIOR AT 2' O.C. STAGGERED SPACING.



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**CHANNEL MATTING
INSTALLATION**

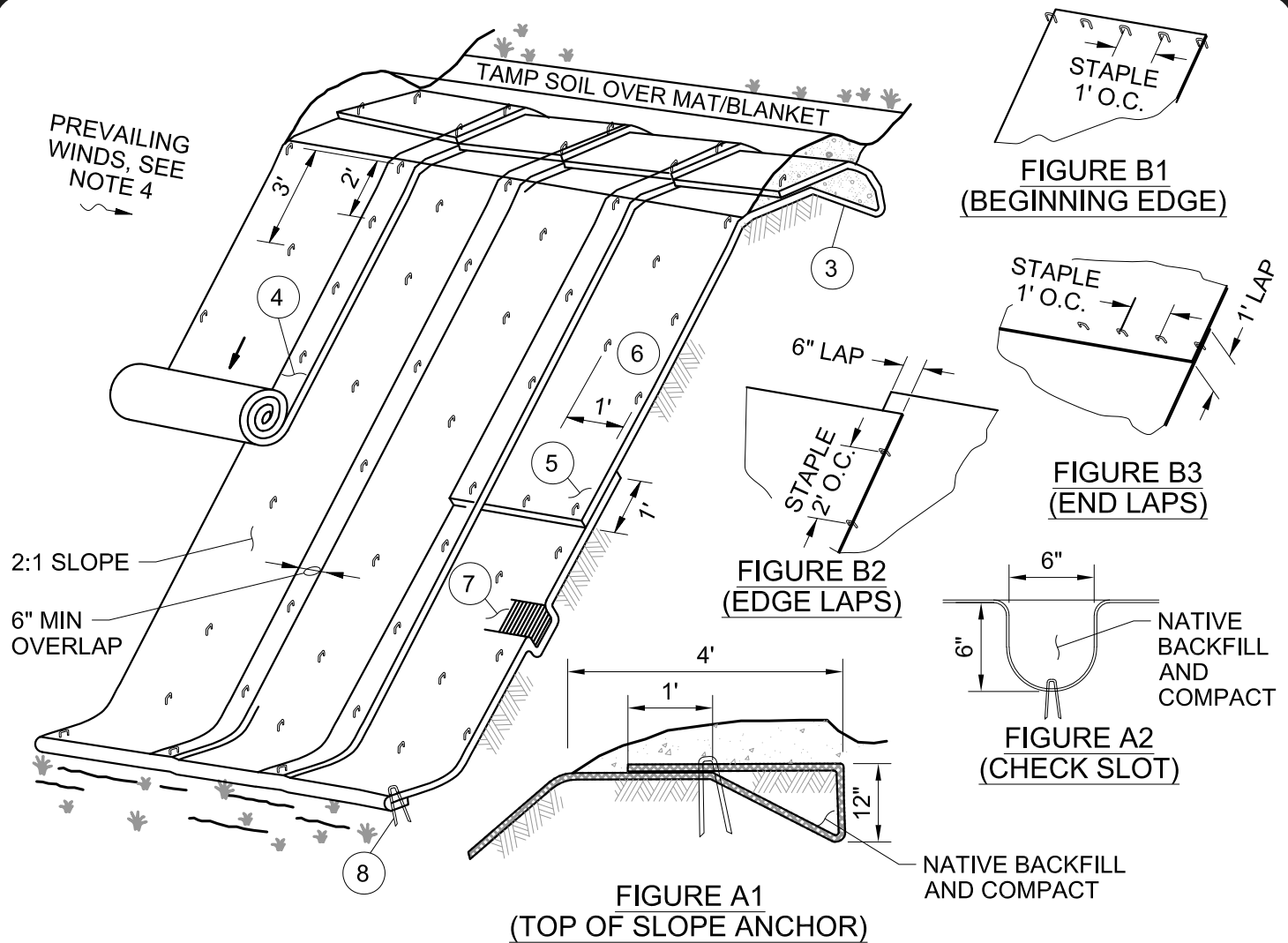
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718




NOTES:

1. INFORMATION SHOWN IS MINIMUM CRITERIA FOR MATTING INSTALLATION. ALL MANUFACTURER'S RECOMMENDATIONS WHICH ARE MORE STRINGENT MUST BE APPLIED. STAPLES IN COHESIVE SOILS SHALL HAVE A 6" STAPLE LENGTH AND IN NON-COHESIVE SOILS SHALL HAVE A 12" STAPLE LENGTH.
2. AREA SHALL BE PREPARED BY REMOVING ALL MATERIALS (VEGETATION, ROCKS, WOOD, ETC.) LARGER THAN 2" IN SIZE. APPLY FERTILIZER AND SEED PRIOR TO MATTING INSTALLATION. PLACE MATTING LOOSELY AND IN FULL CONTACT WITH THE SOIL. DO NOT STRETCH. MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
3. ANCHOR MATTING AT TOP OF SLOPE (FIG. A1) STAPLE IN TRENCH AND AT OVERLAP 1' O.C. (FIG. B1)
4. OVERLAP MAT EDGES 6" AND STAPLE EDGES 2" O.C. (FIG. B2). INSTALL MATTING SO EDGE OVERLAPS ARE SHINGLED AWAY FROM PREVAILING WINDS.
5. OVERLAP MAT ENDS 1', UPPER MAT OVER LOWER MAT, AND STAPLE (FIG. B3).
6. STAGGER ALTERNATE ROWS OF STAPLES ACROSS MAT PLACED AT 1' O.C. STAPLE DOWN THE MIDDLE OF THE MAT AT MAX 3' O.C.
7. CONSTRUCT CHECK SLOT WHEN SPECIFIED OR AS RECOMMENDED BY THE MANUFACTURER (FIG A3). STAPLE MAT IN BOTTOM OF CHECK SLOT (FIG. A3 & B1)
8. EXTEND MAT 2' BEYOND TOE OF SLOPE; FOLD MAT BACK UNDER 4" AND STAPLE (FIG. B1)

DEPARTMENT OF PUBLIC WORKS

362 N. THIRD AVENUE
STAYTON, OR 97383
PH: (503) 769-2919
FAX: (503) 767-2134

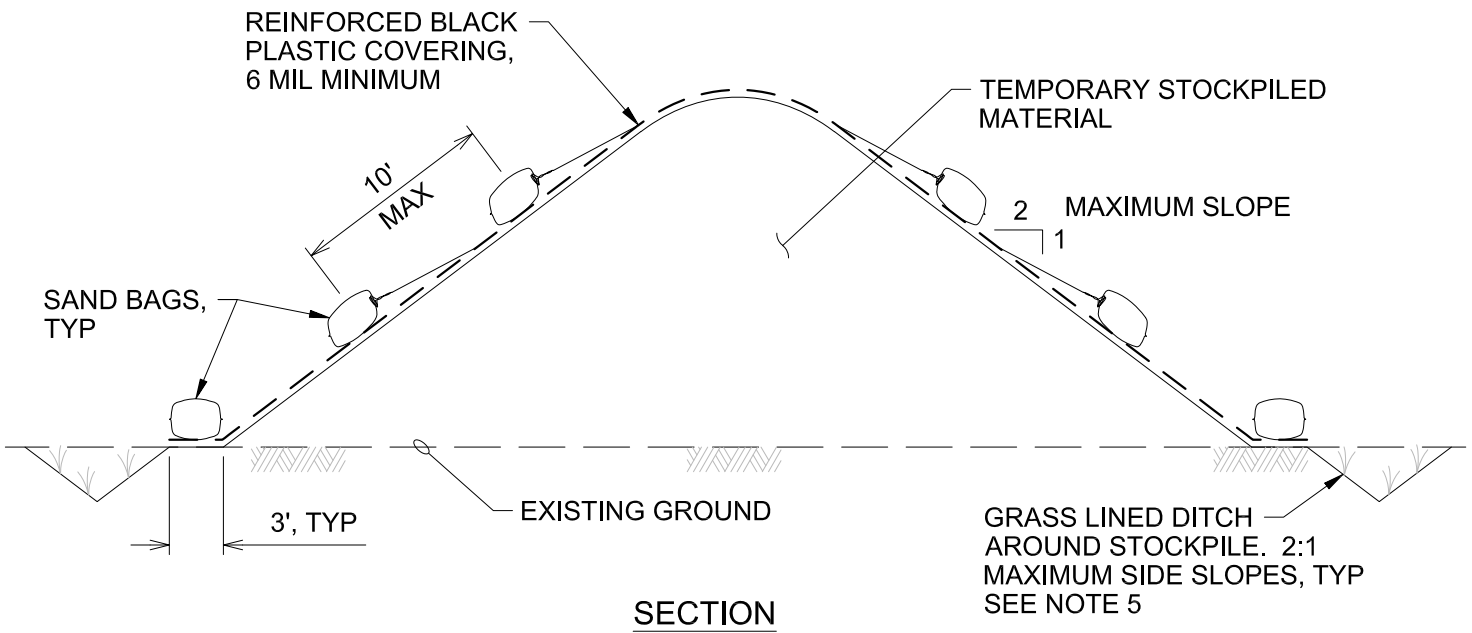
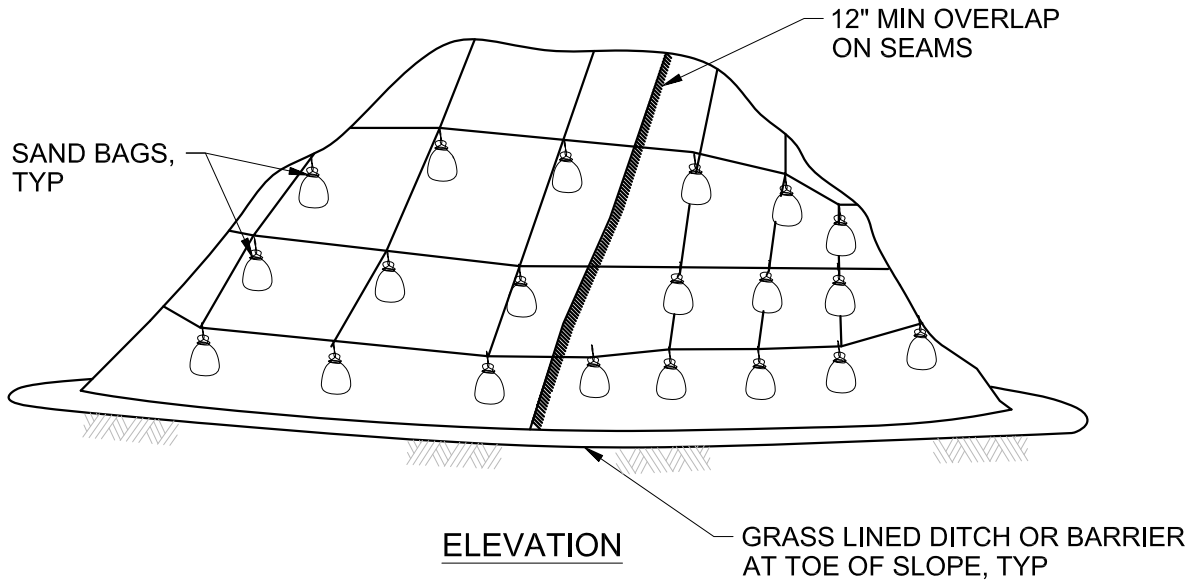


2021 EDITION	
REVIEWED BY	
JTA / LSL	09/21
NAME	DATE
REVISIONS	

STANDARD DRAWING TITLE


SLOPE MATTING INSTALLATION

NO SCALE
DIVISION
ESC
DRAWING NO.
720



NOTES:

1. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH. ALL SEAMS SHALL HAVE A MINIMUM 12" OVERLAP.
2. SEAMS PARALLEL TO THE SLOPE CONTOUR SHALL HAVE THE UPHILL SHEET OVERLAP THE DOWNHILL SHEET.
3. NO SURFACE RUN-OFF SHALL BE ALLOWED TO RUN UNDER THE PLASTIC COVERING.
4. DRAINAGE FROM AREAS COVERED BY REINFORCED PLASTIC SHEETING SHALL BE CONTROLLED SUCH THAT NO DISCHARGE OCCURS DIRECTLY ONTO UNCONTROLLED DISTURBED AREAS OF THE CONSTRUCTION SITE.
5. PROVIDE GRASS LINED DITCH OR BARRIER AT TOE OF SLOPE AS REQUIRED BY CITY ENGINEER.
6. COVERING SHALL BE MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.



DEPARTMENT OF
PUBLIC WORKS

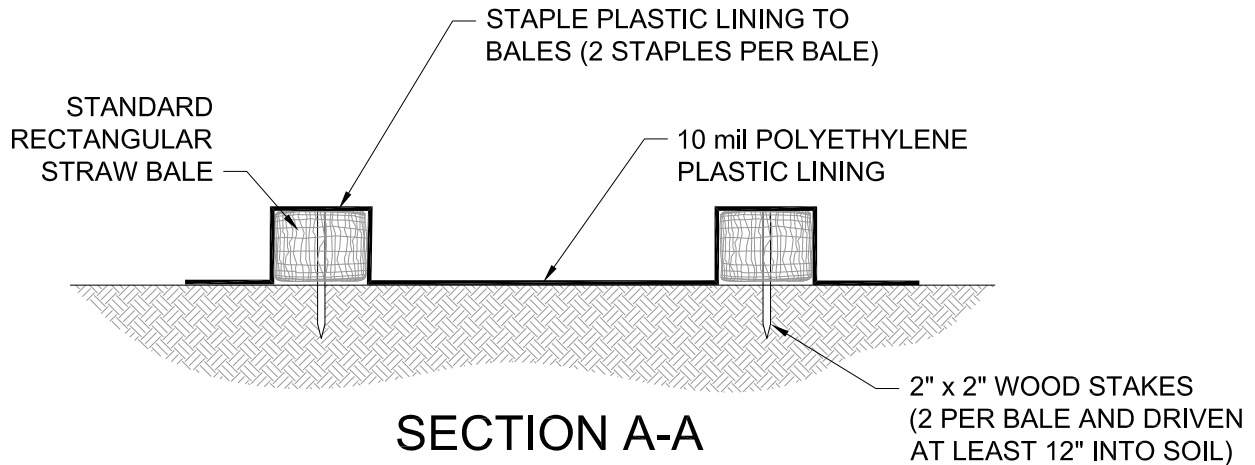
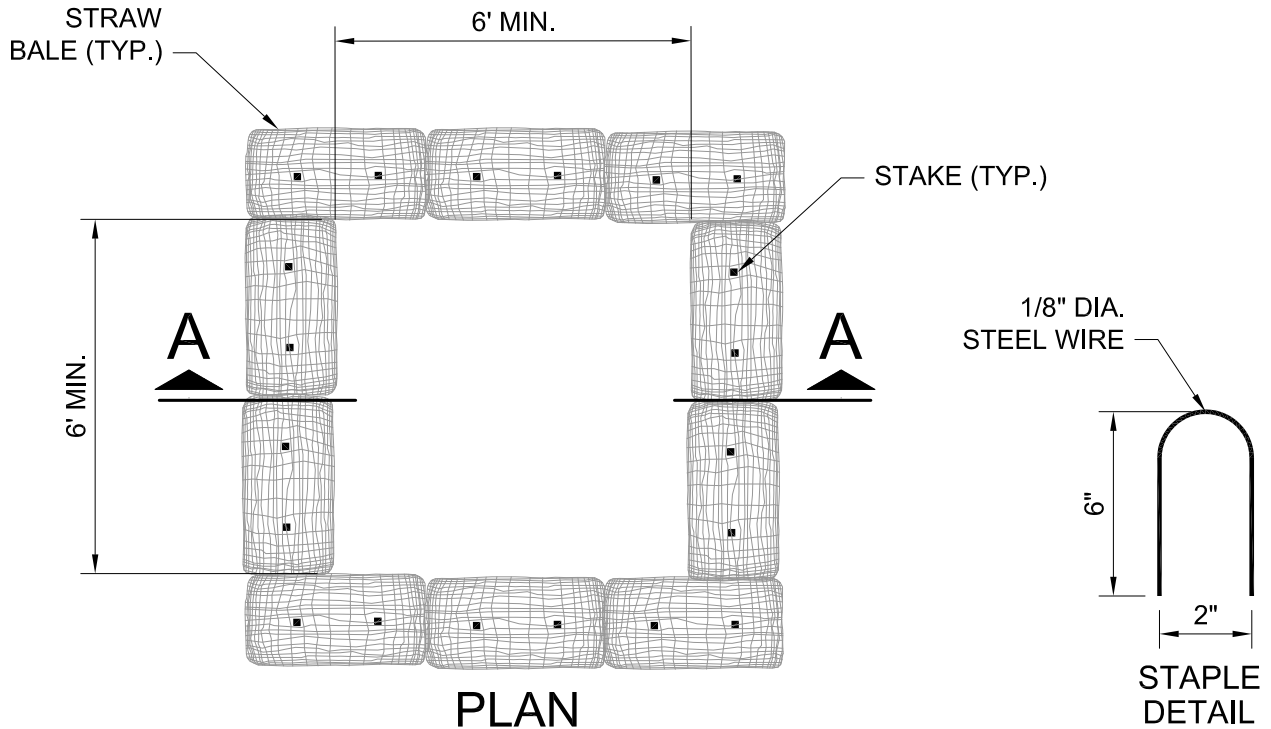
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STANDARD DRAWING TITLE

**TEMPORARY
PLASTIC SHEETING
STOCKPILE COVERING**

NO SCALE
DIVISION
ESC
DRAWING NO.
722



NOTES:

1. CONCRETE WASHOUT ACTIVITIES MUST BE CONDUCTED IN A MANNER THAT DOES NOT CONTRIBUTE POLLUTANTS TO SURFACE WATERS OR RUNOFF. CONCRETE WASHOUT AREAS MAY BE EXCAVATED PITS IN THE GROUND, COMMERCIALY MANUFACTURED PREFABRICATED WASHOUT CONTAINERS, OR ABOVEGROUND HOLDING AREAS CONSTRUCTED OF BERMS, SANDBAGS OR STRAW BALES (AS SHOWN HERE).
2. ALL EXCAVATED PIT AREAS OR ABOVEGROUND HOLDING AREAS SHALL TO BE LINED WITH AN IMPERMEABLE LINER A MINIMUM 10 mil THICKNESS.

WASHOUT CONTAINMENT SHALL PROVIDE SUFFICIENT CAPACITY FOR THE EXPECTED VOLUME OF SOLIDS, WASH WATER, AND RAINFALL TO PREVENT OVERFLOW AND ALLOW A MINIMUM OF 12 INCHES OF FREEBOARD.



DEPARTMENT OF PUBLIC WORKS

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JTA / LSL 09/21

NAME DATE

REVISIONS

STANDARD DRAWING TITLE

CONCRETE WASH OUT

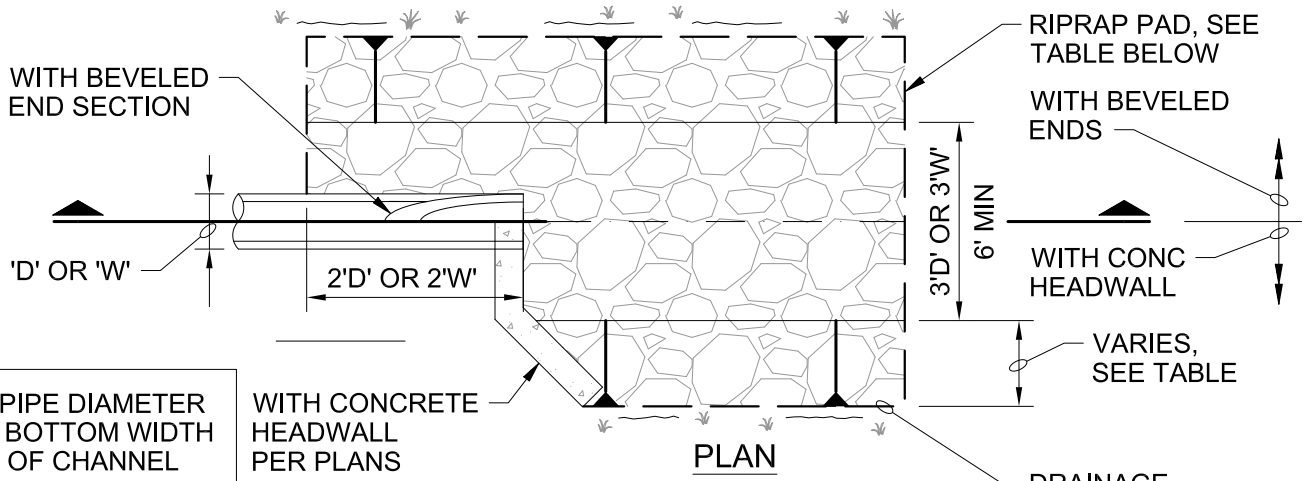
NO SCALE

DIVISION

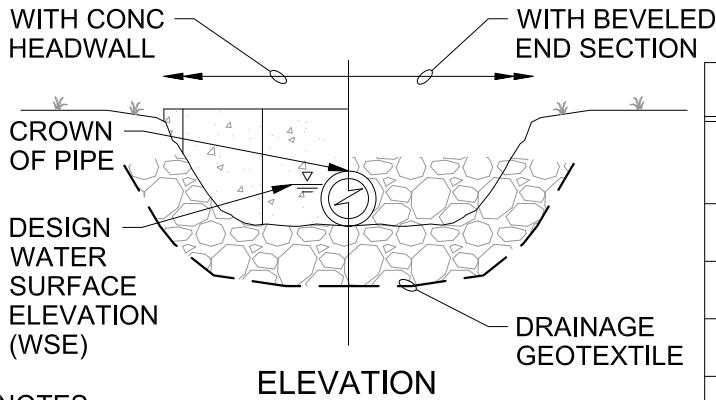
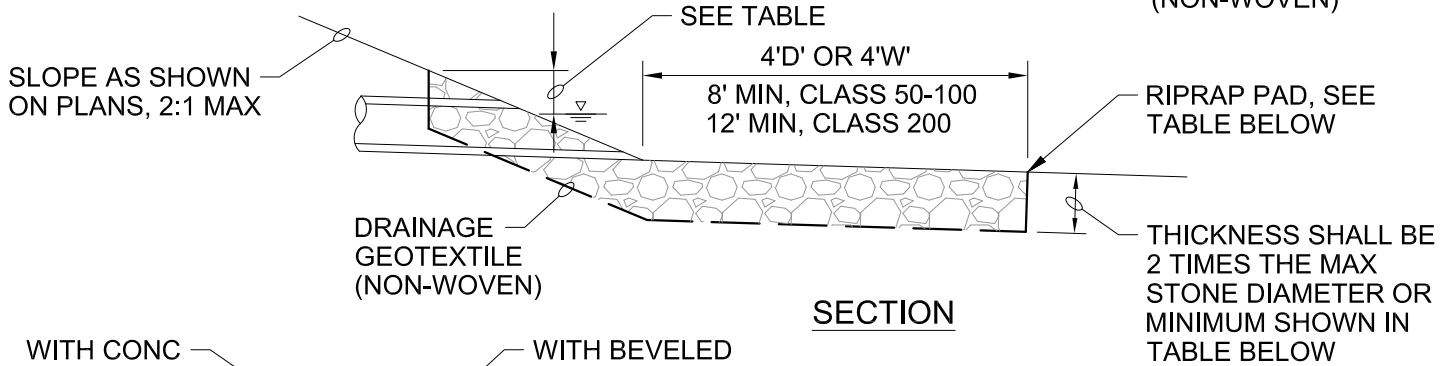
ESC

DRAWING NO.

724




'D' = PIPE DIAMETER
'W' = BOTTOM WIDTH OF CHANNEL



MINIMUM OUTLET PROTECTION			
VELOCITY @ DESIGN FLOW (FPS)	OUTLET PROTECTION	MINIMUM RIPRAP THICKNESS	MIN HEIGHT ABOVE WSE OR PIPE CROWN
0 - 5	ODOT CLASS 50	2 x MAX DIA. 1.5' MIN	1' ABOVE WSE OR CROWN +1'
5 - 8	ODOT CLASS 100	2 x MAX DIA. 2' MIN	1.5' ABOVE WSE OR CROWN +1'
8 - 12	ODOT CLASS 200	2 x MAX DIA. 2.5' MIN	2' ABOVE WSE OR CROWN +1'
> 12	BY DESIGN ENGINEER		

NOTES:

1. THE RIPRAP PAD DIMENSIONS SHOWN ABOVE APPLY TO FLOWS THAT ARE LESS THAN OR EQUAL TO 2 CFS. RIPRAP FOR FLOWS THAT ARE GREATER THAN 2 CFS MUST BE DESIGNED BY THE DESIGN ENGINEER. IN ADDITION, VELOCITIES GREATER THAN 12 FEET PER SECOND SHALL BE DESIGNED BY THE DESIGN ENGINEER. VELOCITIES EXCEEDING 20 FPS SHALL USE AN ENERGY DISSIPATOR.
2. TYPE OF RIPRAP SHALL BE ODOT CLASS 50-200 (ENGLISH) PER THE STANDARD CONSTRUCTION SPECIFICATIONS. CONCRETE SHALL BE USED WHEN REQUIRED BY THE CITY ENGINEER.
3. RIPRAP SHALL BE PLACED A MINIMUM DEPTH OF 2 TIMES THE MAXIMUM STONE DIAMETER REGARDLESS OF MINIMUM RIPRAP THICKNESS SHOWN. RIPRAP SHALL BE PLACED TO MINIMUM HEIGHT ABOVE THE DESIGN WATER SURFACE ELEVATION OR PIPE CROWN AS SHOWN IN THE TABLE ABOVE. RIPRAP SHALL BE PLACED WITH MINIMUM VOIDS. SURFACE ROCKS SHALL PROTRUDE AT LEAST 1/2 THE ROCK VERTICAL DIMENSION. RIPRAP IS TO BE PLACED OVER A NATURAL BEDDING OR SHALL BE GROUTED OR PLACED OVER A GRAVEL BEDDING AS REQUIRED BY THE CITY ENGINEER.
4. REGULATORY APPROVAL MAY BE REQUIRED IF OUTLET IS CONSTRUCTED IN FISH BEARING STREAMS.



DEPARTMENT OF PUBLIC WORKS
362 N. THIRD AVENUE
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STANDARD DRAWING TITLE

RIPRAP OUTLET PROTECTION

NO SCALE
DIVISION
ESC
DRAWING NO.
726



APPENDIX B

AGENCY AND UTILITY CONTACT INFORMATION

The Contractor and its subcontractors must comply with all provisions of OAR 952-001-0010 through 952-001-0090 and ORS 757.542 to 757.562 and 757.993 including notification of all owners of underground facilities at least two (2) working days before, but not more than ten (10) working days before beginning work. Notify in writing at least two (2) working days before commencing any work on the project. The Utilities notification system telephone number is 1-800-332-2344. The Contractor may contact the Oregon Utility Notification Center at (503) 232-1987 about these rules.

City Agencies	Address/Phone Number
Stayton Public Works	311 N Third Ave, Stayton OR, 97383 (503) 769-2919
Stayton City Hall	362 N Third Ave, Stayton OR, 97383 (503) 769-3425
Stayton Fire District	1988 W Ida St, Stayton, OR 97383 (503) 769-2601
Stayton Police Department	386 N Third Ave, Stayton OR, 97383 (503) 769-3421 (non-emergency))

Other Agencies	Address/Phone Number
Santiam Water Control District	284 E Water St, Stayton, OR 97383 (503) 769-2669
Marion County Land Development, Engineering and Permits	555 Court St. NE, RM 2150 Salem, OR 97301 (503) 584-7714
Marion County Public Works	5155 Silverton Rd NE Salem, OR 97305 (503) 588-5036
Oregon Department of Transportation (ODOT) Permits	885 Airport Rd SE, Building P Salem, Oregon 97301 (503) 986-2900

Hospitals	Address/Phone Number
Stayton Memorial Hospital	1401 N. 10 th Avenue Stayton, OR 97383 (503) 769-9259



Utilities	Address/Phone Number
Pacific Power & Light Company (electrical)	825 NE Multnomah, Portland, OR 97232 1-888-221-7070 or (503) 588-9016 Stayton
NW Natural Gas (gas)	3123 Broadway St NE, Salem, OR 97303 503-585-6611
Stayton Cooperative Telephone Company (telephone)	502 N Second Ave, Stayton, OR 97383 (503) 769-2121
Wave Broadband (cable & internet)	277 N. Third Ave, Stayton, OR 97383 1-888-222-5314

Schools	Address/Phone Number
Stayton Elementary School	875 N Third Ave, Stayton OR, 97383 (503) 769-2336
Stayton Middle School	1021 Shaff Rd, Stayton, OR 97383 (503) 769-2198
Stayton High School	757 W Locust St, Stayton, OR 97383 (503) 769-2171
St. Mary Catholic School	1066 N Sixth Ave, Stayton OR, 97383 (503) 769-2718
Regis High School	550 W Regis St, Stayton, OR 97383 (503) 769-2159
Stayton Christian School	189 E Washington St, Stayton OR, 97383 (503) 769-7578

END OF APPENDIX B



APPENDIX C

STANDARD FORMS

AGREEMENTS, DEDICATIONS, AND EASEMENTS

Revision

Developer-Engineer of Record Agreement	Dec 2021
Contractor's Indemnity Agreement	Dec 2021
Stormwater Facilities Operation and Maintenance Agreement - Public	Dec 2021
Stormwater Facilities Operation and Maintenance Agreement - Private	Dec 2021
Notice of Stormwater Facility Operation and Maintenance Plan – Residential	Dec 2021
Ownership Disclosure and Affidavit	Dec 2021
Right-of-Way Deed of Dedication	Dec 2021
Reciprocal Access Easement	Dec 2021
Multi-Use Path/Accessway Easement	Dec 2021
Public Utility Easement	Dec 2021
Water Easement	Dec 2021
Sanitary Sewer Easement	Dec 2021
Storm Drainage Easement	Dec 2021
Slope Easement	Dec 2021
Sidewalk Easement	Dec 2021
Temporary Sidewalk Easement	Dec 2021
Easement Release	Dec 2021

PERMITS / APPLICATIONS / OTHERS

Right-of-Way Permit Application	Dec 2021
Site Development Permit Application	Dec 2021
Site Development Permit Application Checklist	Dec 2021
Certified Impervious Surface Area Inventory & Stormwater Quality Facility Information Sheet	Dec 2021
Plan Review Checklist	Dec 2021
Public Improvements Preliminary Punch-List Item Checklist for Public	Dec 2021
Design Engineer's Notice of Completion and Request for Final Inspection – Sample form	Dec 2021
Design Engineer's Letter of Recommendation for Provisional Acceptance – Sample form	Dec 2021
Design Modification Request Form for Public Works	Dec 2021
Proposed Revisions to the Public Works Standards	Dec 2021

PUBLIC WORKS BOND FORMS

Bid Bond (Publicly Financed Public Improvements)	Dec 2021
Performance Bond (Publicly Financed Public Improvements)	Dec 2021
Payment Bond (Publicly Financed Public Improvements)	Dec 2021
Performance Bond (Privately Financed Public Improvements)	Dec 2021
Maintenance / Warranty Bond (Publicly or Privately Financed Public Improvement)	Dec 2021
Stormwater Facility Maintenance / Warranty Bond (Privately Financed Public Improvement)	Dec 2021

CONSTRUCTION FORMS

Manhole Vacuum Test Report	Dec 2021
Sanitary Sewer Air Test Report	Dec 2021
Sanitary Sewer and Storm Drain Mandrel Test Report	Dec 2021
Waterline Pressure Test Report	Dec 2021

CITY OF STAYTON DEVELOPER-ENGINEER OF RECORD AGREEMENT

By this Agreement, _____, agrees to provide
Engineer of Record
 the necessary professional engineering, surveying and construction inspection services for the development
 project, _____,
Project Name

City Planning File No. _____, in accordance with the City of Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations. Developer and the Engineer agree that the Engineer's scope of work shall, at a minimum, include the following items and responsibilities, as applicable:

- 1) Provide engineering, design, drafting and field surveying services necessary to prepare engineered construction plans for City review and approval of the project in accordance with the Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations. Submit plans and receive approvals from all applicable governing agencies. Coordinate with franchise utility owners as required. Attend a preconstruction meeting.
- 2) Obtain permits from all applicable governing agencies prior to construction. Provide and coordinate the field layout of the public improvements for construction.
- 3) Provide construction inspection for the project as required. Inspectors/observers shall be recognized as representatives of the Engineer and their duties shall be to approve materials and workmanship as required by the approved plans and specifications. The Engineer may give written notice that all work shall be stopped until the Engineer is satisfied that materials and workmanship conform to the approved plans and specifications.
- 4) Prepare and submit Record Drawings for the project, including a written notice of completion, copies of test results and inspection logs, and review and submit to the Stayton Public Works Department for review and approval.
- 5) Developer and the Engineer agree to notify the Stayton Public Works Director immediately if the above Agreement is terminated or if the Engineer for any reason is unable to perform the necessary duties. Developer and the Engineer understand that a breach of this Agreement may be reason for the City to issue a "Stop Work" order. **Note: This Agreement is not transferable.**

Engineer WILL or WILL NOT be providing the necessary surveying services for the project. If not, the name/contact information for the Project's Surveyor is: _____.

ENGINEER: _____

DEVELOPER: _____

By _____
Signature

By _____
Signature

Title

Title

Address

Address

OR License No.

Oregon Professional Registration/License (check all that apply): Surveyor Civil Geotechnical Structural
 Traffic Environmental Architect Landscape Architect (privately maintained improvements only)
 Other Discipline/Specialty (describe): _____.

**CITY OF STAYTON
CONTRACTOR'S INDEMNITY AGREEMENT**

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as Contractor, hereby
Contractor Name

agrees to hold harmless, indemnify, and defend the City of Stayton, a municipal corporation of the State of Oregon; and its consultants, councilors, officers, officials, employees or agents, from any and all liability claims, losses, or damages arising, or alleged to have arisen, from the performance of work during the construction of public works improvements described as all public infrastructure associated with

authorized plans for _____,
Project Name

City Permit No.: _____, by reason of any negligent act or omission of the Contractor, any Subcontractor, or Supplier, or by any agent, employee, or representative of any of them.

IN WITNESS WHEREOF, the undersigned has caused this agreement to be executed by our duly authorized legal representative. If Contractor is an entity (Inc., LLC, LLP, Co., etc) or principal, their representative, by signing below, certifies that such representative is authorized by the entity or principal to execute this Agreement.

Dated this _____ day of _____, 20_____.

By _____
Contractor Representative

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____,

and _____, as _____ of _____, has
Name *Title* *Party*
acknowledged the foregoing instrument to be his or her voluntary act and deed.

NOTARY PUBLIC FOR OREGON

My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Stormwater Facilities
Operation and Maintenance Agreement
(for 2-year Maintenance of Privately Financed Public Storm Facility Improvements)

1. PARTIES:

This Agreement is made and entered into by and between _____, hereinafter referred to as "OWNER", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "CITY".

2. RECITALS:

2.1 WHEREAS, OWNER possesses title to real property located in the _____ 1/4 of Section _____, Township _____ South, Range _____ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Deed Records, hereinafter referred to as the "Property".

Property Address: _____, Stayton, Oregon 97383

Tax Assessor's Map and Lot No.: _____.

2.2 WHEREAS, OWNER has designed and constructed certain stormwater detention, retention, and/or stormwater quality treatment facilities (hereafter referred to as Stormwater Facilities), for the purpose of detaining, retaining, and/or treating stormwater runoff from the Property in accordance with the Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations.

2.3 WHEREAS, the Stormwater Facilities enable development of the Property while mitigating the impacts of additional surface water and the pollutants associated with stormwater runoff prior to discharge from the Property to the public stormwater system. The consideration for this Agreement is connection to the public stormwater system, where approved.

2.4 WHEREAS, the CITY and OWNER agree that effective maintenance of the Stormwater Facilities will best be facilitated by regular inspections in accordance with the Stormwater Facilities Operation and Maintenance (O&M) Plan as set forth in **EXHIBIT "A"**, which, by this reference, is incorporated herein. Failure to inspect and maintain the Stormwater Facilities can result in an unacceptable impact to the public stormwater system.

NOW, THEREFORE, the parties acknowledge and mutually agree to the above recitals and as follows:

3. AGREEMENTS:

3.1 **OWNER INSPECTIONS:** OWNER shall provide inspections of the Stormwater Facilities at least twice a year for conformity with the Operations and Maintenance Plan. At a minimum, one inspection shall occur prior to the onset of Fall rains during the period of September 1 to October 15, and a second inspection shall occur in early Spring during the period April 1 to May 31. Inspections shall also be performed following any storm event of a two-year recurrence interval or greater. OWNER shall maintain a log of inspection activities; Said log shall be available to the CITY upon request.

- 3.2 **DEFICIENCIES:** All aspects in which the Stormwater Facilities fail to satisfy the Operations and Maintenance Plan shall be noted as “Deficiencies”.
- 3.3 **OWNER CORRECTIONS:** All Deficiencies shall be corrected at OWNER’S expense within thirty (30) days after completion of the inspection. If more than 30 days is reasonably needed to correct a Deficiency, OWNER shall have a reasonable period to correct the Deficiency so long as the correction is commenced within the 30-day period and is diligently pursued to completion.
- 3.4 **CITY INSPECTIONS:** OWNER grants to the CITY the right to inspect the Stormwater Facilities. The CITY will endeavor to give ten (10) days prior written notice (as courtesy to OWNER), except that no notice shall be required in case of an emergency. The CITY shall determine whether Deficiencies need to be corrected. OWNER will be notified in writing of the Deficiencies and shall make corrections within 30 days of the date of the notice in accordance with 3.3.
- 3.5 **CITY CORRECTIONS:** If correction of all OWNER or CITY identified Deficiencies is not completed within thirty (30) days, or an extension thereof, after OWNER’S inspection or CITY notice, CITY shall have the right to have any Deficiencies corrected. The CITY shall have access to the Stormwater Facilities for the purpose of correcting such Deficiencies and shall bill OWNER for all costs reasonably incurred by CITY for work performed to correct such Deficiencies (“City Correction Costs”) following OWNER’S failure to correct any Deficiencies in the Facilities. OWNER shall pay to CITY the City Correction Costs within thirty (30) days of the date of the invoice. If payment is not made within 30 days of the date of the invoice, OWNER understands and agrees that upon non-payment, City Correction Costs may be secured by a lien on OWNER’S Property for the City Correction Cost amount plus interest and penalties.
- 3.6 **EMERGENCY MEASURES:** If at any time the CITY reasonably determines that the Stormwater Facilities create an imminent threat to public health, safety or welfare, the CITY may immediately and without prior notice to the OWNER take measures reasonably designed to remedy the threat. The CITY shall provide notice of the threat and the measures taken to OWNER as soon as reasonably practicable, and charge OWNER for cost of these corrective measures.
- 3.7 **INDEMNIFICATION:** OWNER does hereby agree to defend, hold harmless and indemnify the CITY and its agents, consultants, councilors, officers and employees from and against any and all claims, demands, damages, losses, liabilities, actions, lawsuits and other proceedings, judgments and awards, and costs and expenses (including without limitation reasonable attorneys' fees) arising out of the negligence, fraud or any willful act or omission of the OWNER or any of its consultants, officers, directors, agents or employees in connection with this Agreement and the OWNER's maintenance responsibilities required herein, except liability arising out of the sole negligence of the CITY and its agents or employees. Such indemnification shall also cover claims brought against the CITY and its agents, consultants, councilors, officers and employees under state and federal workers' compensation laws. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of this indemnification.

4. GENERAL PROVISIONS:

- 4.1 **NOTICES:** Whenever any notice, consent, approval, demand or request is required or permitted under this Agreement, such notice, consent, approval, demand or request shall be in writing and shall be delivered by hand, sent by registered or certified mail, return receipt requested, or send by pre-paid nationally recognized overnight courier service to the addresses set out below or to such other addresses as are specified by written notice given in accordance herewith.

CITY: City of Stayton
 362 N. Third Avenue
 Stayton, OR 97383

Attn: _____

OWNER: _____

Attn: _____

with a copy to:

Attn: _____

All notices, consents, approvals, demands or requests delivered by hand shall be deemed given upon the date so delivered. Those given by mailing as hereinabove provided shall be deemed given on the date which is three (3) business days after the date on which such notice, demand, or request is so deposited with the United States Postal Service. Those given by pre-paid nationally recognized overnight courier service shall be deemed given on the next business day after being sent via such courier.

- 4.2 **NO OBLIGATION TO THIRD PARTIES:** None of the responsibilities and obligations of the OWNER or the CITY under this Agreement shall in any way or in any manner be deemed to create any liability to, or any rights in, any person or entity other than the specific parties to this Agreement.
- 4.3 **ASSIGNMENT:** This Agreement shall not be assigned by the OWNER to anyone without the prior written consent of the CITY, and any such assignment by the OWNER without the prior written consent of the CITY shall be null, void and of no force and effect. This Agreement shall not be assigned by the CITY without the prior written consent of the OWNER. Upon any permitted assignment of this Agreement by the OWNER or CITY, the assigning party shall cause the assignee to expressly assume in writing the assigning party's obligations under this Agreement first arising or accruing after the date of the assignment.
- 4.4 **AMENDMENTS:** The terms of this Agreement may be amended only by mutual agreement of the parties. Any amendments shall be in writing, shall refer specifically to this Agreement, and shall be valid only when executed by both parties to this Agreement and recorded in the official Deed Records of Marion County, Oregon.
- 4.5 **REMEDIES:** In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Agreement.
- 4.6 **DISPUTE RESOLUTION:** In the event a dispute arises by reason of the terms of this Agreement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.
- 4.7 **FORCE AND EFFECT:** The parties agree and it is so declared that this Agreement and the covenants and representations made herein constitute covenants running with the land and a burden upon the Property herein described and the terms, conditions and provisions of this Agreement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.
- 4.8 **SEVERABILITY:** The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.
- 4.9 **GOVERNING LAW:** This Agreement is to be governed and construed in accordance with the laws of the State of Oregon. Venue for any action regarding this Agreement shall be in Marion County, Oregon.

CITY:

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has entered into this Agreement on behalf of the CITY OF STAYTON.

Notary Public for OREGON
My Commission expires:

EXHIBIT “A”

STORMWATER OPERATION AND MAINTENANCE PLAN

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Stormwater Facilities
Operation and Maintenance Agreement
(for Privately Owned and Maintained Stormwater Facilities)

1. PARTIES:

This Agreement is made and entered into by and between _____, hereinafter referred to as "OWNER", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "CITY".

2. RECITALS:

2.1 WHEREAS, OWNER possesses title to real property located in the _____ 1/4 of Section _____, Township _____ South, Range _____ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Deed Records, hereinafter referred to as the "Property".

Property Address: _____, Stayton, Oregon 97383

Tax Assessor's Map and Lot No.: _____.

2.2 WHEREAS, OWNER has designed and constructed certain stormwater detention, retention, and/or stormwater quality treatment facilities (hereafter referred to as Stormwater Facilities), for the purpose of detaining, retaining, and/or treating stormwater runoff from the Property in accordance with the Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations.

2.3 WHEREAS, the Stormwater Facilities enable development of the Property while mitigating the impacts of additional surface water and the pollutants associated with stormwater runoff prior to discharge from the Property to the public stormwater system. The consideration for this Agreement is connection to the public stormwater system, where approved.

2.4 WHEREAS, the CITY and OWNER agree that effective maintenance of the Stormwater Facilities will best be facilitated by regular inspections in accordance with the Stormwater Facilities Operation and Maintenance (O&M) Plan as set forth in **EXHIBIT "A"**, which, by this reference, is incorporated herein. Failure to inspect and maintain the Stormwater Facilities can result in an unacceptable impact to the public stormwater system.

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- 3.2 **DEFICIENCIES:** All aspects in which the Stormwater Facilities fail to satisfy the Operations and Maintenance Plan shall be noted as "Deficiencies".
- 3.3 **OWNER CORRECTIONS:** All Deficiencies shall be corrected at OWNER'S expense within thirty (30) days after completion of the inspection. If more than 30 days is reasonably needed to correct a Deficiency, OWNER shall have a reasonable period to correct the Deficiency so long as the correction is commenced within the 30-day period and is diligently pursued to completion.
- 3.4 **CITY INSPECTIONS:** OWNER grants to the CITY the right to inspect the Stormwater Facilities. The CITY will endeavor to give ten (10) days prior written notice (as courtesy to OWNER), except that no notice shall be required in case of an emergency. The CITY shall determine whether Deficiencies need to be corrected. OWNER will be notified in writing of the Deficiencies and shall make corrections within 30 days of the date of the notice in accordance with 3.3.
- 3.5 **CITY CORRECTIONS:** If correction of all OWNER or CITY identified Deficiencies is not completed within thirty (30) days, or an extension thereof, after OWNER'S inspection or CITY notice, CITY shall have the right to have any Deficiencies corrected. The CITY shall have access to the Stormwater Facilities for the purpose of correcting such Deficiencies and shall bill OWNER for all costs reasonably incurred by CITY for work performed to correct such Deficiencies ("City Correction Costs") following OWNER'S failure to correct any Deficiencies in the Facilities. OWNER shall pay to CITY the City Correction Costs within thirty (30) days of the date of the invoice. If payment is not made within 30 days of the date of the invoice, OWNER understands and agrees that upon non-payment, City Correction Costs may be secured by a lien on OWNER'S Property for the City Correction Cost amount plus interest and penalties.
- 3.6 **EMERGENCY MEASURES:** If at any time the CITY reasonably determines that the Stormwater Facilities create an imminent threat to public health, safety or welfare, the CITY may immediately and without prior notice to the OWNER take measures reasonably designed to remedy the threat. The CITY shall provide notice of the threat and the measures taken to OWNER as soon as reasonably practicable, and charge OWNER for cost of these corrective measures.
- 3.7 **INDEMNIFICATION:** OWNER does hereby agree to defend, hold harmless and indemnify the CITY and its agents, consultants, councilors, officers and employees from and against any and all claims, demands, damages, losses, liabilities, actions, lawsuits and other proceedings, judgments and awards, and costs and expenses (including without limitation reasonable attorneys' fees) arising out of the negligence, fraud or any willful act or omission of the OWNER or any of its consultants, officers, directors, agents or employees in connection with this Agreement and the OWNER's maintenance responsibilities required herein, except liability arising out of the sole negligence of the CITY and its agents or employees. Such indemnification shall also cover claims brought against the CITY and its agents, consultants, councilors, officers and employees under state and federal workers' compensation laws. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of this indemnification.

4. GENERAL PROVISIONS:

- 4.1 **NOTICES:** Whenever any notice, consent, approval, demand or request is required or permitted under this Agreement, such notice, consent, approval, demand or request shall be in writing and shall be delivered by hand, sent by registered or certified mail, return receipt requested, or send by pre-paid nationally recognized overnight courier service to the addresses set out below or to such other addresses as are specified by written notice given in accordance herewith.

CITY: City of Stayton
 362 N. Third Avenue
 Stayton, OR 97383

Attn: _____

OWNER: _____

Attn: _____

with a copy to:

Attn: _____

All notices, consents, approvals, demands or requests delivered by hand shall be deemed given upon the date so delivered. Those given by mailing as hereinabove provided shall be deemed given on the date which is three (3) business days after the date on which such notice, demand, or request is so deposited with the United States Postal Service. Those given by pre-paid nationally recognized overnight courier service shall be deemed given on the next business day after being sent via such courier.

4.2 **NO OBLIGATION TO THIRD PARTIES:** None of the responsibilities and obligations of the OWNER or the CITY under this Agreement shall in any way or in any manner be deemed to create any liability to, or any rights in, any person or entity other than the specific parties to this Agreement.

4.3 **ASSIGNMENT:** This Agreement shall not be assigned by the OWNER to anyone without the prior written consent of the CITY, and any such assignment by the OWNER without the prior written consent of the CITY shall be null, void and of no force and effect. This Agreement shall not be assigned by the CITY without the prior written consent of the OWNER. Upon any permitted assignment of this Agreement by the OWNER or CITY, the assigning party shall cause the assignee to expressly assume in writing the assigning party's obligations under this Agreement first arising or accruing after the date of the assignment.

4.4 **AMENDMENTS:** The terms of this Agreement may be amended only by mutual agreement of the parties. Any amendments shall be in writing, shall refer specifically to this Agreement, and shall be valid only when executed by both parties to this Agreement and recorded in the official Deed Records of Marion County, Oregon.

4.5 **REMEDIES:** In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Agreement.

4.6 **DISPUTE RESOLUTION:** In the event a dispute arises by reason of the terms of this Agreement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

4.7 **FORCE AND EFFECT:** The parties agree and it is so declared that this Agreement and the covenants and representations made herein constitute covenants running with the land and a burden upon the Property herein described and the terms, conditions and provisions of this Agreement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

4.8 **SEVERABILITY:** The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.

4.9 **GOVERNING LAW:** This Agreement is to be governed and construed in accordance with the laws of the State of Oregon. Venue for any action regarding this Agreement shall be in Marion County, Oregon.

CITY:

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has entered into this Agreement on behalf of the CITY OF STAYTON.

Notary Public for OREGON
My Commission expires:

EXHIBIT "A"

STORMWATER OPERATION AND MAINTENANCE PLAN

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON
Notice of Stormwater Facility
Operation and Maintenance Plan
(for Residential Lot Roof Drainage Infiltration Systems only)

IT IS DECLARED, that we, _____, the undersigned
OWNER(s), possesses title to real property

located in the _____ 1/4 of Section _____, Township ____ South, Range _____ West,
Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and

recorded _____ in Reel _____, Page _____, Marion County Deed Records,
hereinafter referred to as the "Property".

Property Address: _____, Stayton, OR 97383.

Tax Assessor's Map and Lot No.: _____.

WHEREAS, the OWNER(s) had certain residential lot roof drainage infiltration systems (hereafter referred to as Stormwater Facilities), designed and constructed for the purpose of retaining stormwater runoff from the Property in accordance with the Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations. The OWNERS(s) hereby gives notice that the Stormwater Facilities shall be operated and maintained in accordance with the Property's "Stormwater Facility Operations and Maintenance Plan" to be placed on-file with the City of Stayton Public Works Department. References are made to the Stormwater Facility Operations and Maintenance Plan for all terms, conditions, provisions and particulars thereof, which are hereby incorporated by reference as though fully set forth herein.

NOW, THEREFORE, the City has the right to ensure site compliance with the Stormwater Facilities Operation and Maintenance Plan in accordance with the Stayton Municipal Code, Stayton Public Works Standards, and applicable permits, laws and regulations. To the extent permitted by law, the City may enter all private and public premises at any time for the purpose of inspecting for potential violations, connections or for any other lawful purpose. This authorization includes but is not limited to inspection, sampling, testing, photographic documentation, record examination, copying, and installation of devices. The requirement to operate and maintain the Stormwater Facility in accordance with the on-file Stormwater Facility Operations and Maintenance Plan is binding on all current and future owners of the Property. The Stormwater Facility Operations and Maintenance Plan may be modified under written consent of the new owner(s) with written approval by, and re-filing with the City of Stayton Public Works Department.

The Stormwater Facility Operations and Maintenance Plan pursuant to this notice may be reviewed and examined at the Stayton Public Works and Planning Building at 311 N. Third Avenue, Stayton, OR, 97383, between the hours of 8 a.m. and 5 p.m., Monday through Friday, except legal holidays. Call (503) 769-2919. Copies of the Stormwater Facility Operations and Maintenance Plan may be obtained upon payment of a non-refundable fee.

The on-going operational, maintenance and financial responsibility of the Stormwater Facilities shall be the responsibility of (*check one*):

HOMEOWNER'S ASSOCIATION

PROPERTY OWNER(S)

OTHER (*describe*): _____

ACCORDINGLY, the undersigned has caused this instrument to be executed by our duly authorized legal representative. If OWNER(s) is an entity (Inc., LLC, LLP, Co., etc) or principal, their representative, by signing below, certifies that such representative is authorized by the entity or principal to execute this instrument.

Dated this _____ day of _____, 20____.

OWNER(S):

(Signature)

(Signature)

(Print)

(Print)

STATE OF OREGON }
 }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20____,

and _____, Owner(s) of the above described Property has acknowledged the foregoing instrument to be his/her voluntary act and deed.

Notary Public for OREGON
My Commission expires:

Ownership Disclosure and Affidavit

1. PARTIES:

_____, hereinafter referred to as "Grantor".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Deed Records.

3. OWNERSHIP DISCLOSURE:

List all individuals and entities with an ownership interest as an Owner of real property, as Grantors. Said list should include, without limitation, any and all trustees, general and limited partnerships, corporate officers, managers, agents of homeowner's associations, limited liability companies, partnerships and joint ventures.

Owner Name	Relationship/Position	% of Ownership	*CUSIP

**CUSIP is a code issued to publicly traded companies (N/A if not applicable).*

4. OWNERSHIP AFFIDAVIT:

- a. That there is no outstanding indebtedness for equipment, appliances, or other fixtures attached to the Property.
- b. That insofar as deponent is (or deponents are) aware, all improvements on the Property are within the boundary lines of the Property and do not encroach on any other land.
- c. That the lines and corners of the Property are clearly marked, and that there are no disputes concerning the location of the lines and corners.
- d. That there are no pending suits, proceedings, judgments, bankruptcies, liens, or executions against Owner (or Owners) either in Marion County or any other County in the State of Oregon, except for those items listed on "EXHIBIT A" (if appropriate) attached hereto and by this reference incorporated herein.
- e. That Owner has (or Owners have) been in open and peaceful possession of the Property, that deponents know of no adverse claims to Owner's (or Owners') claim of title, and that Owner has (or Owners have) a perfect right to convey good, fee simple, marketable title to the Property free and clear of any liens or encumbrances.
- f. That no improvements or repairs have been made on the Property during the ninety-five (95) days immediately preceding this date or, if there were any such improvements or repairs made, that the agreed price or reasonable value of all labor, services and materials has been paid to a11 contractors,

- subcontractors, suppliers, laborers, materialmen or other person providing such labor, services or materials; that the improvements or repairs have been fully completed in accordance with the terms of the contracts; that there are no contracts pending and not yet completed; and that there are no outstanding debts incurred for labor or materials used in making such improvements or repairs or for services of architects, surveyors, engineers or other person incurred in connection therewith.
- g. That there are no unpaid bills or liens against the Property for water, storm, sewer, sidewalk, street or any other improvements.
 - h. That there are no leases or tenancies on the Property.
 - i. That there are no retention of title contracts, bills of sale or other encumbrances of record affecting title to any personal property installed on the Property.
 - j. That deponent has (*or deponents have*) received no notice of, nor is deponent (*or are deponents*) aware of any pending, threatened or contemplated action by any governmental authority or agency having the power of eminent domain, which might result in any part of the Property being taken by condemnation or conveyed in lieu thereof.
 - k. That Owner has (*or Owners*) have not entered into, nor are there, any agreements or contracts relating to any development, sale or leasing of the Property except to CITY OF STAYTON.
 - l. That deponent has (*or deponents have*) received no notice (oral or written) that any municipality or other governmental or quasi-governmental authority has determined that there are any violations of zoning, health, environmental, or other statutes, ordinances or regulation affecting the Property, and deponent has (*or deponents have*) no knowledge of any such violation. In the event deponent has (*or deponents have*) knowledge of any such violations prior to the closing of the sale of the Property to CITY OF STAYTON, deponent (*or deponents*) shall promptly notify CITY OF STAYTON thereof.
 - m. That deponent has (*or deponents have*) no knowledge of the Property having been previously used as a landfill, dump, or storage facility for garbage or refuse.
 - n. That deponent has (*or deponents have*) received no notice (oral or written) of the existence of any areas on the Property where "hazardous substances or waste" (as hereinafter defined) have been disposed of released, or found, and deponents have no knowledge of the existence of any such areas or of the storage or disposal of any hazardous substances or waste on the Property. For purposes of this Affidavit, the term "hazardous substances or waste" shall mean petroleum (including crude oil or any fraction thereof), petroleum products, asbestos or asbestos products and any substance identified in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, or any other federal, state or county legislation or ordinances regarding use, storage or disposal of substances which may be termed "hazardous" or "waste".
 - o. That Owner is (*or Owners are*) not classed as non-resident alien (*or aliens*) for purposes of income taxation by the United States of America.
 - p. Deponent is (*or Deponents are*) aware that this Affidavit is made to induce CITY OF STAYTON to accept the Property from Owner (*or Owners*). Deponent acknowledges (*or Deponents acknowledge*) that the matters set forth herein pertain to such state of facts as exists on the date this Ownership Disclosure and Affidavit is given prior to the delivery of the Right of Way Deed or Easement to the CITY OF STAYTON.

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON

Right-of-Way Deed of Dedication

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 Section ____, Township __ South, Range __ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF RIGHT-OF-WAY:

Grantor hereby does forever grant and agree to dedicate and dedicates unto the Grantee, its successors and assigns, in FEE SIMPLE, all rights, title and interest which the Grantor has, or may have, in and to any portion of the property of the Grantor included in or embraced within the limits of the right-of-way and appurtenances, slopes and embankments, as set forth in the attached legal description in **EXHIBIT "A"**, and a Dedication map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein, and Grantee hereby accepts the real property situated in the City of Stayton, County of Marion, State of Oregon, as public right-of-way for roadway and utility purposes.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

In addition to the foregoing, for the same consideration, Grantor does further dedicate and grant to Grantee an easement over the adjoining land subject to this right-of-way and utility easement dedication that is necessary for the construction and maintenance of standard slopes to protect and support the roadway, embankments and other appurtenances according to the standards contained in the City of Stayton Public Works Standards for streets on file in the Public Works Department.

Said Grantor hereby warrants that it has the right to sell and convey the property on which said right of way, utility easement and slope easement are located and binds itself, its successors and assigns forever to warrant and defend the right and title to the above-described property, right of way and easements unto Grantee, its successors and assigns, against the claims of all persons whomever by virtue of these presents. Said Grantor hereby waives for itself, its successors and assigns, all rights to any further compensation or claim to damages on account of the construction or maintenance of said roadway as herein described and agreed.

4. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Dedication.

5. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Dedication, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

GRANTEE:

Pursuant to ORS 92.014(2), the dedication of land for public purposes set forth in this instrument is hereby approved and accepted by the CITY OF STAYTON this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____ authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the dedication on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires:

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON Reciprocal Access Easement

1. PARTIES:

First Party

Second Party

2. AFFECTED PROPERTY:

_____, ("First Party") is currently the Owner of the following described real property located in the City of Stayton, County of Marion, State of Oregon:

Tax Lot No.: _____, more particularly described in **EXHIBIT "A"** attached hereto and incorporated by reference.

_____, ("Second Party") is currently the Owner of the following described real property located in the City of Stayton, County of Marion, State of Oregon:

Tax Lot No.: _____, more particularly described in **EXHIBIT "B"** attached hereto and incorporated by reference.

Lots _____ through _____ of _____ in the CITY OF STAYTON, according to the Official Plat thereof, recorded in the Marion County Oregon Book of Town Plats, Volume _____ at page _____.

3. GRANT OF EASEMENT:

The above designated parties desire to establish appropriate cross-easements to permit the Owners of each Lot, their tenants and guests, to use the driveways providing access to _____, and access between Lots (collectively the "Driveways") and parking areas ("Parking Areas") for the Lots, and to permit the owners of the Lots to hook-up to any utility lines that may run within the Driveways and Parking Areas of each Lot.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by both Parties.

4. STATEMENT OF PURPOSE:

The Reciprocal Access Easement described above shall be for unrestricted ingress and egress to provide access and specific rights as further described below:

Driveways. Each Owner, their tenants and guests, shall have the right to use each and every Driveway within the Business Center to access their respective Lots. Such right of access shall be utilized in a manner designed to minimize any interference that such access might cause to the tenants and guests or the Owners of the Lots. This right of access is intended to be perpetual, but it may be revised with the prior approval of the Owners of all Lots, so long as such revised access does not have a material adverse affect upon any Lot. Each Owner and their tenants shall have the right to temporary construction Easements to construct necessary Driveways on

undeveloped adjacent Lots with the right of the Owner of said Lot to modify said driveways in the development of their Lots, as long as they still provide access to adjacent Lots.

Parking Areas. The Owners of each Lot, each tenant, and their respective employees, shall park exclusively in the Parking Areas on their respective Lots. No parking or other obstruction shall be permitted in any common access or Driveways.

Utilities. Any Owner of a Lot may purpose to connect with or install utility lines over the Driveways and Parking Areas of one or more of the Lots. An Owner shall have this right of connection and installation if it creates a less costly alternative to another means of utility access. An Owner shall have the right to connect and install such utility lines, at the installer's sole cost and expense, as long as such connections and utility lines do not interfere in any manner with the other Lot Owner's utility services. Prior to commencing any such work, the Owner desiring to connect and install utility lines across another Lot shall post a bond assuring the other affected Lot Owners that the work will be completed in a good and workmanlike manner, that the surface of the affected Lots will be restored to at least the condition existing prior the installation work and that all suppliers of labor and material will be paid in full. Such work shall be performed in a manner that will minimize inconvenience to the other affected Lot Owners and shall be completed with reasonable promptness after commencement. The installing Owner shall thereafter maintain the utility lines in good condition and repair and defend, indemnify and hold the affected Lot Owners harmless there from.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive. No structures, plantings, or other materials shall be placed or permitted to remain which may damage, interfere with or change the direction or flow of drainage facilities in the Easements. The Easement shall perpetually encumber the property ("run with the land").

6. MAINTENANCE:

The parties, or their successors or assigns, shall be jointly responsible for all maintenance of the cross-Easement area and shall maintain the area in a good condition for ingress and egress from both properties.

7. INDEMNIFICATION:

The parties hereby do agree to hold harmless the other party, their successors, and assigns from any claim of liability or otherwise arising out of their use or their customers or invitees or the public's use of the Easement described above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

SECOND PARTY:

(Signature)

(Signature)

(Print)

(Print)

Mailing Address: _____

STATE OF _____ }

COUNTY OF _____ } ss

Personally appeared before me this _____ day of _____, 20_____, and

_____ has acknowledged the foregoing instrument to be his/her voluntary act and deed.

By: _____

Notary Public for _____
My Commission expires: _____

CITY OF STAYTON:

(Signature)

(Print)

STATE OF OREGON }

COUNTY OF MARION } ss

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Multi-Use Path/Access Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 Section ____, Township __ South, Range __ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Multi-Use Path/Access Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be used for public multi-use path/access (path) and to maintain an earth cut/fill supporting the path and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, maintaining, and replacing the path and for public use of the path.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install and maintain the path and earth cut/fill slopes and all related facilities within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, maintain, repair, replace and remove earth cut/fill slopes incident thereto or necessary therewith; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, inspect and relocate such slopes; and, to make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said slopes; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the

ability of the Grantee to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the paths within the Easement shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of the path and earth cut/fill slopes within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim involving the path, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill their maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

12. GOVERNING LAW:

This Easement is to be governed and construed in accordance with the laws of the State of Oregon. Venue for any action regarding this Easement shall be in Marion County.

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Public Utility Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Public Utility Easement (PUE) upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be used for all municipal purposes, including but not limited to, street, sidewalk and street related uses, sewer, water and storm drainage; and, for the use and benefit of public utility companies furnishing electric power, natural gas, communication, and cable television; and, to construct and maintain public utilities and the related earth cut/fill slope supporting the adjacent street improvements; and, for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, testing, maintaining, and replacing the utilities; and, for maintaining the earth cut/fill slope and related facilities.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee, and each utility owner beneficiary of this Easement, shall have the exclusive right to construct, install, maintain and operate the utilities, their equipment and all related facilities above and below ground within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee, and each utility owner beneficiary of this Easement, to excavate for, construct, build, install, lay, patrol, operate, maintain, repair, replace and remove underground sanitary sewer, storm drain, or water pipelines; electric power, transmission, and supply cables; natural gas pipelines; and, cable television and communication lines, with all appurtenances incident thereto or necessary therewith, including aboveground valve boxes, fire hydrants or manholes, in, under, and across the said premises; and, together with the right of Grantee and public utility companies to place, excavate, replace, repair, install, maintain, operate, inspect, add to the number of and relocate such utilities and necessary appurtenances; and, make excavations from time to time, in, under, and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said utilities, or appurtenances

attached to or connected therewith; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful, or convenient for the enjoyment of the Easement hereby granted. In addition, Grantee shall have the right to construct, maintain and repair street, sidewalk and street related facilities and improvements within the Easement area.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to, landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee or utilities to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement or over any utility fixture therein, without a specific written agreement between Grantee, affected utility owners who may be beneficiaries of this Easement, and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the utilities, sidewalk and street related facilities shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee, and each utility owner beneficiary of this Easement, shall be responsible for the maintenance of the utilities and related facilities located within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim arising out of a failure of the public utilities located in the Easement, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill their maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Water Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____, West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Water Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be for water utilities (utilities) and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, testing, maintaining, and replacing the utilities; and, for maintaining the utilities and related facilities.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, maintain and operate the water lines, its equipment and all related facilities above and below ground within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, operate, maintain, repair, replace and remove underground water lines with all appurtenances incident thereto or necessary therewith, including aboveground valve boxes, fire hydrants and all other appurtenances in, under and across the said premises; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, operate, inspect, add to the number of and relocate such utilities and necessary appurtenances; and, make excavations from time to time, in, under, and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said utilities or appurtenances attached to or connected therewith; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful, or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to, landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement or over any utility fixture therein without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the utilities shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of water equipment and facilities located within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim arising out of a failure of the water utilities located in the Easement, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill its maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Sanitary Sewer Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____, West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Sanitary Sewer Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be for sanitary sewer utilities (utilities) and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, testing, maintaining and replacing the utilities.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, maintain and operate the sewer lines, its equipment and all related facilities above and below ground within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, operate, maintain, repair, replace and remove underground sanitary sewer lines with all appurtenances incident thereto or necessary therewith, including aboveground cleanouts or manholes, in, under and across the said premises; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, operate, inspect, add to the number of and relocate such utilities and necessary appurtenances; and, to make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said utilities or appurtenances attached to or connected therewith; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to, landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee or utilities to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement or over any utility fixture therein without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the utilities shall be assumed by Grantor, their successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of sewer equipment and facilities located within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim arising out of a failure of the sewer utilities located in the Easement, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill their maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires:

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

**CITY OF STAYTON, OREGON
Storm Drainage Easement
(Permanent)**

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Storm Drainage Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be for storm drainage and all related storm drainage facilities above and below ground within the Easement; and, to construct and maintain public storm drainage facilities and the related earth cut/fill slope supporting the storm drainage facilities; and, for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, testing, maintaining, and replacing the storm drainage facilities.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, maintain and operate the storm drainage facilities, its equipment and all related facilities above and below ground within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, operate, maintain, repair, replace and remove underground storm drainage lines with all appurtenances incident thereto or necessary therewith, including aboveground storm drainage facilities, cleanouts or manholes, in, under and across the said premises; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, operate, inspect, add to the number of and relocate such facilities and necessary appurtenances; and, make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said facilities or appurtenances attached to or connected therewith; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to, landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement or over any utility fixture therein without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the facilities shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of storm drainage equipment and facilities located within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim arising out of a failure of the storm drainage facilities located in the Easement, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill its maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Slope Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 Section ____, Township __ South, Range __ West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Slope Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be used to construct and maintain an earth cut/fill (slope) supporting the adjacent street improvements and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, maintaining, and replacing the earth cut/fill slope and related facilities.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, and maintain earth cut/fill slopes and all related facilities within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, maintain, repair, replace and remove earth cut/fill slopes incident thereto or necessary therewith; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, inspect, relocate such slopes; and, make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said slopes; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the

ability of the Grantee to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the sidewalks within the Easement shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of the earth cut/fill slopes within the Easement. Grantor shall be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantee hereby does agree to defend, hold harmless and indemnify Grantor, its successors and assigns, from any claim of liability or any other claim involving the slope, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill its maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

12. GOVERNING LAW:

This Easement is to be governed and construed in accordance with the laws of the State of Oregon. Venue for any action regarding this Easement shall be in Marion County.

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON
Sidewalk Easement
(Permanent)

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____, West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does forever grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a permanent Sidewalk Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be used to construct and maintain sidewalks and the related earth cut/fill slope supporting the adjacent street improvements and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, maintaining, and replacing the sidewalk and related earth cut/fill slopes and for public use of the sidewalk.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, and maintain sidewalks, earth cut/fill slopes and all related facilities within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, maintain, repair, replace and remove sidewalks, earth cut/fill slopes incident thereto or necessary therewith; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, inspect, add to the number of and relocate such sidewalks; and, make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said sidewalks; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement

without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee or utilities to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the sidewalks within the Easement shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of earth cut/fill slopes and related facilities supporting the sidewalk within the Easement. As provided in the Stayton Municipal Code, Grantor shall be responsible for all adjacent public sidewalk improvements. Grantor shall also be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. INDEMNIFICATION:

The Grantor hereby does agree to defend, hold harmless and indemnify Grantee, its successors and assigns, from any claim of liability or any other claim involving the sidewalks, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill its maintenance obligations as set forth in Paragraph 6 above.

8. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

9. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

10. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

11. SEVERABILITY:

The invalidity of any section, clause, sentence, or provision of this Easement shall not affect the validity of any other part of this Easement, which can be given effect without such invalid part or parts.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires:

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

**CITY OF STAYTON, OREGON
Sidewalk Easement
(Temporary)**

1. PARTIES:

_____, hereinafter referred to as "Grantor", and the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter referred to as "Grantee".

2. AFFECTED PROPERTY:

Grantor is currently the Owner of a tract of land located in the _____ 1/4 of Section ____, Township ____, South, Range ____, West, Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

3. GRANT OF EASEMENT:

Grantor hereby does grant unto the Grantee, its successors and assigns, and Grantee hereby accepts, a Temporary Sidewalk Easement upon a portion of Grantor's real property as set forth in the attached legal description in **EXHIBIT "A"**, and an Easement map for the legal description in **EXHIBIT "B"**, which, by this reference, are incorporated herein.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby acknowledged by Grantor and Grantee.

4. STATEMENT OF PURPOSE:

The Easement described above shall be used to construct and maintain temporary sidewalks and the related earth cut/fill slope supporting the adjacent street improvements and for unrestricted ingress and egress to Grantor's property for the purpose of installing, repairing, maintaining, and replacing the sidewalk and related earth cut/fill slopes and for public use of the sidewalk, as part of the _____ project.

5. TYPE OF EASEMENT:

The Easement described above shall be non-exclusive except that Grantee shall have the exclusive right to construct, install, and maintain sidewalks, earth cut/fill slopes and all related facilities within the Easement, including the right of access to such facilities and the right to remove any obstructions including trees and vegetation within the Easement.

The Easement shall include the exclusive right, privilege and authority to Grantee to excavate for, construct, build, install, lay, patrol, maintain, repair, replace and remove sidewalks, earth cut/fill slopes incident thereto or necessary therewith; and, together with the right of Grantee to place, excavate, replace, repair, install, maintain, inspect, add to the number of and relocate such sidewalks; and, make excavations from time to time, in, under and through the above-described premises within said Easement; and, to cut and remove from said Easement any trees and other obstructions which may endanger the safety or interfere with the use of said sidewalks; and, the right of ingress and egress to and over said above-described premises at any and all times for the above purposes; and, for doing anything necessary, useful or convenient for the enjoyment of the Easement hereby granted.

Grantor may use the surface of the Easement provided such use does not interfere with Grantee's rights contained in this Easement. Grantor shall not permit any other use or utilities to be located in the Easement

without the written consent of Grantee. Approved uses within the Easement shall consist of, but are not limited to landscaping, paved driveway or parking areas, trails, paths, sidewalks or other uses that will not affect the ability of the Grantee or utilities to access the Easement. Prohibited uses shall consist of, but are not limited to, permanent structures, buildings, or any other obstruction, excavation or alteration of the Easement. The Easement shall perpetually encumber the property ("run with the land"). No earth fill or embankment shall be placed within the Easement without a specific written agreement between Grantee and Grantor, their successors, or assigns. Should such specific agreement be executed, Grantee will set forth the conditions under which such fill or embankment may be placed, including a stipulation that all risks of damage to the sidewalks within the Easement shall be assumed by Grantor, its successors, or assigns.

6. MAINTENANCE:

Grantee shall be responsible for the maintenance of earth cut/fill slopes and related facilities supporting the sidewalk within the Easement. As provided in the Stayton Municipal Code, Grantor shall be responsible for all adjacent public sidewalk improvements. Grantor shall also be responsible for landscape and surface maintenance within the Easement. Grantee's use of the Easement shall not unreasonably interfere with Grantor's use of the property.

Upon the initial installation, and upon each and every occasion that the same be repaired, replaced, renewed, added to, or removed, Grantee shall restore the premises of Grantor, and any improvements disturbed by the work, to as good condition as it was prior to any such installation or work, including the restoration of any topsoil and lawn.

7. TERM OF EASEMENT:

The Easement shall be temporary and shall terminate when the Grantee has approved completion of the _____ project.

8. INDEMNIFICATION:

The Grantor hereby does agree to defend, hold harmless and indemnify Grantee, its successors and assigns, from any claim of liability or any other claim involving the sidewalks, or arising out of the Grantee's use of the Easement described above, unless caused by Grantor's negligent or willful conduct or Grantor's failure to fulfill its maintenance obligations as set forth in Paragraph 6 above.

9. REMEDIES:

In addition to all other remedies allowed by law, the parties, their successors and assigns, shall have the right to seek injunctive relief for the enforcement of the terms and conditions of this Easement.

10. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this Easement, the parties agree that the exclusive remedy is to resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded attorneys' fees and costs at the discretion of the Arbitrator.

11. FORCE AND EFFECT:

The parties agree and it is so declared that this Easement and the covenants and representations made herein constitute covenants running with the land and a burden upon the property herein described and the terms, conditions and provisions of this Easement shall extend to, be binding upon and inure to the benefit of the heirs, personal representatives and assigns of the parties.

GRANTEE:

This instrument is hereby approved and accepted by the CITY OF STAYTON, this _____ day of _____, 20_____.

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed, and has accepted the Easement on behalf of the CITY OF STAYTON.

Notary Public for _____
My Commission expires: _____

AFTER RECORDING RETURN TO:
CITY OF STAYTON
362 N. Third Avenue
Stayton, Oregon 97383

CITY OF STAYTON, OREGON Release of Easement

IT IS DECLARED, that the CITY OF STAYTON, a Municipal Corporation in the State of Oregon, hereinafter called Grantor, does hereby release and relinquish all the right, title and interest of the Grantor in the premises arising by reason of that certain easement granted in the deeds recorded in the official records of Marion County Oregon:

1. AFFECTED EASEMENT:

Grant from _____, to the CITY OF STAYTON,
dated _____, 20_____.

The easement was for _____

located in the _____ 1/4 of Section _____, Township _____ South, Range _____ West, of
the Willamette Meridian, located in the City of Stayton, County of Marion, State of Oregon, as described and
recorded _____ in Reel _____, Page _____, Marion County Oregon Deed Records.

TRUE AND ACTUAL CONSIDERATION: Valuable consideration; but, zero dollars, which is hereby
acknowledged by Grantor and Grantee.

2. DISPUTE RESOLUTION:

In the event a dispute arises by reason of the terms of this release of easement, the exclusive remedy is to
resolve the issues by mandatory mediation. If the matter is not resolved by mediated settlement, then it shall be
submitted to binding arbitration in accordance with Oregon law, and the prevailing party may be awarded
attorneys' fees and costs at the discretion of the Arbitrator.

3. GOVERNING LAW:

This release of easement is to be governed and construed in accordance with the laws of the State of Oregon.
Venue for any action regarding this release of easement shall be in Marion County.

4. AUTHORITY AND EXECUTION:

This instrument is hereby authorized by the CITY OF STAYTON, this _____ day of
_____, 20_____.

GRANTOR:

CITY OF STAYTON

(Signature)

(Print)

STATE OF OREGON }
 } ss
COUNTY OF MARION }

Personally appeared before me this _____ day of _____, 20_____, and _____, authorized agent of the CITY OF STAYTON, has acknowledged the foregoing instrument to be his/her and the CITY OF STAYTON's voluntary act and deed.

Notary Public for _____
My Commission expires: _____



City of Stayton

Department of Public Works
362 N. 3rd Avenue
Stayton, Oregon 97383

Permit No.: _____

Land Use File No.: _____
(if applicable)

RIGHT-OF-WAY PERMIT APPLICATION

This permit covers the review of engineering design and construction of utilities, streets, alleys, sidewalks, driveway approaches, curbs and gutters and other public improvement projects within the City of Stayton public rights-of-way and/or easements. All work shall conform to the Stayton Municipal Code, Stayton Public Works Standards, applicable permits, laws and regulations. Street pavement cuts shall comply with Stayton Municipal Code Title 12.04. **Applicant shall call 503-769-2919 to notify the City Inspector 24 hours prior to start of the project. Contractor shall call 503-769-2919 a minimum of 48 hours prior to required inspections.**

THIS PERMIT IS SUBJECT TO THE GENERAL TERMS AND CONDITIONS SHOWN ON THE REVERSE SIDE.

OWNER INFORMATION

APPLICANT INFORMATION

Name: _____

Name: _____

Contact: _____

Contact: _____

Address: _____

Address: _____

Phone/Fax: _____

Phone/Fax: _____

Email: _____

Email: _____

ENGINEER / ARCHITECT INFORMATION

CONTRACTOR INFORMATION

Name: _____

Name: _____

Contact: _____

Contact: _____

Address: _____

Address: _____

Phone/Fax: _____

Phone/Fax: _____

Email: _____

Email: _____

License No.: _____

License No.: _____

PROJECT INFORMATION

Project Name: _____

Site Address: _____ Closest Intersecting Streets: _____

Tax Lot No.: _____ Tax Lot Map No.: _____

Estimated Start Date: _____ Estimated Project Duration: _____

Primary Reason for Permit Application (check all that apply):

Street Cut

Trenching

Bore / Pothole

Type 1: Street Trees / Shrubs / Landscaping (install/replace)

Type 2: Sidewalks / Driveways / Signs (outside of pavement areas)

Type 3: Street Improvements (approaches, curb/gutters, etc.)

Type 4: Stormwater Facility / Public Utility(s): _____

Type 5: Franchise Utility: _____

Type 6: Encroachment / Closure: _____

Other: _____

By my signature, I certify that I have read this permit application and agree to the general terms and conditions. I certify that the supplied information above is correct. I agree to comply with the Stayton Municipal Code, Stayton Public Works Standards, applicable permits, laws, and regulations pertaining to the proposed design and construction, and hereby authorize City representatives to enter upon the above property for inspection purposes. I understand and agree to pay all review and permit costs, to repair or replace any property damaged while work is being performed under this permit and acknowledge that failure to pay these costs when due will constitute a violation of the terms of the permit and the City may avail itself to any and all legal remedies.

Authorized Signature: _____ **Date:** _____

For Staff Use Only

Received By (initial): _____ **Date:** _____ **Fee Paid:** _____ **Receipt No.:** _____

Permit Approved By: _____ **Permit Issue Date:** _____



City of Stayton

Department of Public Works
362 N. 3rd Avenue
Stayton, Oregon 97383

CHARGES FOR EARLY EXCAVATION (STREET MORATORIUM)

In accordance with Stayton Municipal Code Title 12.04.140, in order to conserve new paving and resurfacing of streets, pavement cuts in travel lanes are prohibited for one (1) year after final approval of pavement placement, except when a contractor places new pavement along the full length of the cut, plus 10 feet at both ends of the cut, and across the full width of the street. After the one (1) year moratorium, pavement may only be cut upon payment of a penalty charge. The maximum period of time for which such penalty shall apply shall be five (5) years.

- a. The charge for early excavation of any public facility shall be a specified cost per square foot of excavation (length x width = square foot of excavation) multiplied by the number of years remaining in the penalty period. The specified cost per square foot shall be set by resolution.
 - ❖ First year after surfacing: As stated above.
 - ❖ Second year after surfacing: Cost x square footage of excavation x 4.
 - ❖ Third year after surfacing: Cost x square footage of excavation x 3.
 - ❖ Fourth year after surfacing: Cost x square footage of excavation x 2.
 - ❖ Fifth year after surfacing Cost x square footage of the excavation.
- b. The City will inform utilities and affected property owners before new paving or resurfacing is performed. Whenever practicable, the City will provide a tentative list of street improvements six months prior to construction.
- c. Potholing smaller than four square yards shall be allowed outside the travel lanes without penalty.

GENERAL TERMS AND CONDITIONS

1. The applicant shall submit 3-sets of site plans to the Public Works Department for review.
2. Permit is valid for 180 days from date of issue or as specified in an attachment. An extension of time may be requested not less than 48 hours prior to expiration. This permit shall be kept at the work site. CALL 503-769-2919 FOR INSPECTIONS.
3. All work shall comply with the Stayton Municipal Code (SMC), the Stayton Public Works Standards (PWS), ADA requirements, applicable permits, laws, regulations, and the Terms and Conditions contained herein and/or attached hereto. Applicant agrees to comply with the above description of work and approved plans. Any Applicant or Contractor who has done work not in conformance with the PWS or who violates the SMC shall be ineligible to do work in public rights-of-way until such deficiency has been corrected to the satisfaction of the City.
4. The Applicant is advised that utilities and other facilities may be in the vicinity of the proposed work site. The Applicant shall immediately notify the utility owner if facilities are encountered. Relocation of existing facilities will be at Applicant's expense.
5. The Applicant shall be responsible and liable for all accidents, environmental clean-up, damages or injuries to any person or property resulting from the construction, maintenance, repair, operation or use of a facility for which the Applicant may be legally liable. The Applicant shall indemnify and hold harmless the City of Stayton and its councilors, officers, consultants, employees or agents from and against all claims, demands, penalties, damages, losses, expenses, including attorney's fees, and causes of action of any kind or character, including the cost of defense thereof, arising or alleged to have risen in favor of any person on account of personal injury, death, or damage to property arising out of or resulting from, or alleged to have risen out of or resulted from, in whole or in part, any act or omission of the Applicant, his contractors, agents or employees, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
6. Unless waived as indicated on the permit form, the Applicant shall provide insurance and bonds as required by SMC.
7. The spreading of mud or debris upon any street is strictly prohibited and violation shall be cause for immediate cancellation of the permit. Clean up shall be at the Applicant's expense. The street shall be cleaned of all dirt and debris at the end of each workday, or more frequently if so determined by the City.
8. IMPORTANT NOTE: EXCAVATORS MUST POTHOLE TO LOCATE UNDERGROUND UTILITY FACILITIES. In addition, Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center if the work involved excavation. Those rules are set forth in ORS 757.542 through 757.562 and OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center. (Note: The telephone number for the Oregon Utility Notification Center is 1-800-332-2344.)
9. When directed by City Engineer, control density fill (CDF) shall be used as backfill material in place of crushed rock in all trenches in paved areas that are not parallel to the roadway and all trenches parallel to the roadway that are less than 50' in length.
10. Asphalt pavement replacement shall be a minimum of 4-inches of AC pavement, or match existing AC pavement depth, whichever is greater, compacted in equal lifts not to exceed 3-inches. All existing pavement edges are to be sawn. All damage to pavement must be repaired within two (2) days of completion of an approach.
11. Upon completion of the work, the work site must be restored equivalent to original condition or better. Applicant shall remain responsible for satisfactory workmanship and materials for one (1) year after acceptance of improvements authorized by this permit.
12. The City has the right and authority to issue a stop work order and impose a FINE OF \$500.00 DOLLARS PER DAY for each day that such violation continues for failure to comply with the provisions of this permit.



City of Stayton

Department of Public Works
362 N. 3rd Avenue
Stayton, Oregon 97383

Permit No.: _____

Land Use File No.: _____
(if applicable)

SITE DEVELOPMENT PERMIT APPLICATION

This permit covers the review of engineering design and construction for development within the City of Stayton. All work shall conform to the Stayton Municipal Code, Stayton Public Works Standards, applicable permits, laws and regulations. Street pavement cuts shall comply with Stayton Municipal Code Title 12.04. **Applicant shall call 503-769-2919 to notify the City Inspector 24 hours prior to start of the project. Contractor shall call 503-769-2919 a minimum of 48 hours prior to required inspections.**

THIS PERMIT IS SUBJECT TO THE GENERAL TERMS AND CONDITIONS SHOWN ON THE REVERSE SIDE.

<u>OWNER INFORMATION</u>		<u>APPLICANT INFORMATION</u>	
Name: _____		Name: _____	
Contact: _____		Contact: _____	
Address: _____		Address: _____	
Phone/Fax: _____		Phone/Fax: _____	
Email: _____		Email: _____	
<u>ENGINEER / ARCHITECT INFORMATION</u>		<u>CONTRACTOR INFORMATION</u>	
Name: _____		Name: _____	
Contact: _____		Contact: _____	
Address: _____		Address: _____	
Phone/Fax: _____		Phone/Fax: _____	
Email: _____		Email: _____	
License No.: _____		License No.: _____	
<u>PROJECT INFORMATION</u>			
Project Name: _____			
Site Address: _____	Closest Intersecting Streets: _____		
Tax Lot No.: _____	Tax Lot Map No.: _____		
Estimated Start Date: _____	Estimated Project Duration: _____		
Primary Reason for Permit Application (check all that apply):			
<input type="checkbox"/> Subdivision, No. Lots: _____	<input type="checkbox"/> Partition, No. Lots: _____	<input type="checkbox"/> Commercial	<input type="checkbox"/> Parking Lot
<input type="checkbox"/> Street Light	<input type="checkbox"/> Sign	<input type="checkbox"/> Utility(s): _____	<input type="checkbox"/> Grading/Excavation
	<input type="checkbox"/> Stormwater Facility	<input type="checkbox"/> Other: _____	
By my signature, I certify that I have read this permit application and agree to the general terms and conditions and certify that the supplied information above is correct. I agree to comply with the Stayton Municipal Code, Stayton Public Works Standards, applicable permits, laws and regulations pertaining to the proposed design and construction, and hereby authorize City representatives to enter upon the above property for inspection purposes. I understand and agree to pay all review and permit costs, to repair or replace any property damaged while work is being performed under this permit and acknowledge that failure to pay these costs when due will constitute a violation of the terms of the permit and the City may avail itself to any and all legal remedies.			
Authorized Signature: _____		Date: _____	

For Staff Use Only

Received By (initial): _____ Date: _____ Fee Paid: _____ Receipt No.: _____

Permit Approved By: _____ Permit Issue Date: _____



City of Stayton

Department of Public Works
362 N. 3rd Avenue
Stayton, Oregon 97383

CHARGES FOR EARLY EXCAVATION (STREET MORATORIUM)

In accordance with Stayton Municipal Code Title 12.04.140, in order to conserve new paving and resurfacing of streets, pavement cuts in travel lanes are prohibited for one (1) year after final approval of pavement placement, except when a contractor places new pavement along the full length of the cut, plus 10 feet at both ends of the cut, and across the full width of the street. After the one (1) year moratorium, pavement may only be cut upon payment of a penalty charge. The maximum period of time for which such penalty shall apply shall be five (5) years.

- a. The charge for early excavation of any public facility shall be a specified cost per square foot of excavation (length x width = square foot of excavation) multiplied by the number of years remaining in the penalty period. The specified cost per square foot shall be set by resolution.
 - ❖ First year after surfacing: As stated above.
 - ❖ Second year after surfacing: Cost x square footage of excavation x 4.
 - ❖ Third year after surfacing: Cost x square footage of excavation x 3.
 - ❖ Fourth year after surfacing: Cost x square footage of excavation x 2.
 - ❖ Fifth year after surfacing Cost x square footage of the excavation.
- b. The City will inform utilities and affected property owners before new paving or resurfacing is performed. Whenever practicable, the City will provide a tentative list of street improvements six months prior to construction.
- c. Potholing smaller than four square yards shall be allowed outside the travel lanes without penalty.

GENERAL TERMS AND CONDITIONS

1. Permit is valid for 180 days from date of issue or as specified in an attachment. An extension of time may be requested not less than 48 hours prior to expiration. This permit shall be kept at the work site. CALL 503-769-2919 FOR INSPECTIONS.
2. All work shall comply with the Stayton Municipal Code (SMC), the Stayton Public Works Standards (PWS), ADA requirements, applicable permits, laws, regulations, and the Terms and Conditions contained herein and/or attached hereto. Applicant agrees to comply with the above description of work and approved plans. Any Applicant or Contractor who has done work not in conformance with the PWS or who violates the SMC shall be ineligible to do work in public rights-of-way until such deficiency has been corrected to the satisfaction of the City.
3. The Applicant is advised that utilities and other facilities may be in the vicinity of the proposed work site. The Applicant shall immediately notify the utility owner if facilities are encountered. Relocation of existing facilities will be at Applicant's expense.
4. The Applicant shall be responsible and liable for all accidents, environmental clean-up, damages or injuries to any person or property resulting from the construction, maintenance, repair, operation, or use of a facility for which the Applicant may be legally liable. The Applicant shall indemnify and hold harmless the City of Stayton and its councilors, officers, consultants, employees or agents from and against all claims, demands, penalties, damages, losses, expenses, including attorney's fees, and causes of action of any kind or character, including the cost of defense thereof, arising or alleged to have risen in favor of any person on account of personal injury, death, or damage to property arising out of or resulting from, or alleged to have risen out of or resulted from, in whole or in part, any act or omission of the Applicant, his contractors, agents or employees, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
5. Unless waived as indicated on the permit form, the Applicant shall provide insurance and bonds as required by SMC.
6. The spreading of mud or debris upon any street is strictly prohibited and violation shall be cause for immediate cancellation of the permit. Clean up shall be at the Applicant's expense. The street shall be cleaned of all dirt and debris at the end of each workday, or more frequently if so determined by the City.
7. **IMPORTANT NOTE: EXCAVATORS MUST POTHOLE TO LOCATE UNDERGROUND UTILITY FACILITIES.** In addition, Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center if the work involved excavation. Those rules are set forth in ORS 757.542 through 757.562 and OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center. (Note: The telephone number for the Oregon Utility Notification Center is 1-800-332-2344.)
8. When directed by City Engineer, control density fill (CDF) shall be used as backfill material in place of crushed rock in all trenches in paved areas that are not parallel to the roadway and all trenches parallel to the roadway that are less than 50' in length.
9. Asphalt pavement replacement shall be a minimum of 4-inches of AC pavement, or match existing AC pavement depth, whichever is greater, compacted in equal lifts not to exceed 3-inches. All existing pavement edges are to be sawn. All damage to pavement must be repaired within two (2) days of completion of an approach.
10. Upon completion of the work, the work site must be restored equivalent to original condition or better. Applicant shall remain responsible for satisfactory workmanship and materials for one (1) year after acceptance of improvements authorized by this permit.
11. The City has the right and authority to issue a stop work order and impose a FINE OF \$500.00 DOLLARS PER DAY for each day that such violation continues for failure to comply with the provisions of this permit.



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

SITE DEVELOPMENT PERMIT APPLICATION CHECKLIST

(to be submitted with the Site Development Permit Application)

This checklist is a tool to assist applicants in submitting a complete Site Development Permit Application and to help the City to expedite the permit applications. In addition, it is intended that a complete review will be able to be accomplished with the first submittal. An incomplete application will be returned without a complete City review being performed. This checklist review for a complete application does not fall under the same constraints as a land use application. The applicant shall check off all items submitted on this checklist and/or note if they are not applicable, and return it attached to a dated Transmittal Form or Cover Letter accompanying the submittal. Should any item not be needed or applicable to the project, then a brief statement of explanation needs to be written in the space below the item. **Electronic copies of the entire Site Development Permit Application Package need to be emailed to both the Director of Public Works Lance Ludwick; lludwick@ci.stayton.or.us and to the City Engineer John Ashley; jashley@ashleyengr.com.** Once the permit is ready for approval by the City, the applicant shall deliver 5 sets of the final plans to the City's Public Works Office for stamped approval

SECTION 1: Items below must be submitted and accepted by the City with the Site Development Permit Application:

- Signed and dated Site Development Permit Application Checklist, along with a dated Transmittal Form or Cover Letter for the entire submittal.
- A completed and signed Site Development Permit Application, including any required fully executed special permit conditions. **Note: Acceptance of the application and review fee does not deem the permit approved.**
- Review by the Design Engineer that all applicable Land Use Planning Conditions of Approval have been satisfied.
- One (1) set of preliminary engineered construction plans for review by the City.
- Final Traffic Study, as applicable.
- Preliminary Intersection Sight Distance if meeting public roadway, stamped by a registered Civil Engineer or Traffic Engineer, as applicable.
- Final Stormwater Drainage Report, stamped/signed, and certified.
- Final Certified Impervious Surface Area Inventory and Stormwater Quality Facility Information Sheet, signed and certified. *See Public Works Standard Forms.*
- Final Infiltration Test Results, as applicable
- Final Geotechnical Report, as applicable.
- Fire Hydrant Flow Test report and Water System Analysis for the public water, as applicable.
- Design Modification Request Form, stamped/signed, as applicable.
- Developer-Engineer of Record Agreement signed by the Developer and the Design Engineer. *See Public Works Standard Forms.*
- Payment of permit application plan review fees.

Submitted By:	Date:
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SECTION 2: Items from Section 1 above, and the items below must be submitted and accepted by the City prior to receiving Final Engineered Construction Plan Approval by the City:

- An itemized Construction Bid Tab or Design Engineer's Estimate including itemized construction costs.
- Developer-Engineer-City Agreement signed and notarized by the Developer and the Design Engineer, as applicable. *See Public Works Standard Forms. Note that actual construction bid unit costs shall be used for determining the qualified public improvement SDC credits or reimbursement costs for the Developer-Engineer-City Agreement.*
- Other Agency Approvals. Attach copies of all approvals and/or permits issued by other governing agencies.
- Any required Construction Deferral and Waiver of Rights of Remonstrance Agreement. *See Public Works Standard Forms.*
- Any required Stormwater Facilities Operation and Maintenance Plans and Agreement. *See Public Works Standard Forms.*
- Any required Easement(s) and/or Right-of-Way Dedication(s). *See Public Works Standard Forms.*

Submitted By:	Date:
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SECTION 3: Items from Sections 1 and 2 above, and the items below must be submitted and accepted by the City prior to City issuance of a Site Development Permit:

- Five (5) sets of engineered construction plans for approval by the City. Three (3) of the five approved sets are retained by the City and two (2) are returned to the applicant. Any additional plan sets required by the Developer need to be provided in addition to the five sets.
- Other Agency Permits. Attach copies of all permits issued by other governing agencies.
- Detailed Project Construction Schedule.
- Construction Materials / Manufacturer's Certificate Submittals, as applicable.
- Certificate of Insurance in the Contractor's name, identifying the project name and permit number and naming the City of Stayton, its consultants, officers, employees and agents as additional insured. **Note: If the project name, permit number or additional named insured information are missing, the certificate can not be accepted.**
- Signed and Notarized Contractor's Indemnity Agreement. *See Public Works Standard Forms.*
- Approved Standard Privately Financed Public Improvement Performance Bond, No. _____.
See Public Works Standard Forms.
- Payment of all required permit fees.
- Pre-Construction Conference. **Note: the Pre-Construction Conference shall not be scheduled until plans are authorized by the City and the permit items noted above have been submitted. Allow five (5) working days notice to the City prior to the Pre-Construction Conference.**

Submitted By:	Date:
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SECTION 4: Items below must be submitted and accepted by the City prior to Final Completion of a Site Development Permit:

- Payment of all required final permit fees.
- Intersection Sight Distance Certification if meeting public roadway, stamped by a registered Civil Engineer or Traffic Engineer, as applicable.
- Final infiltration test results and stormwater management facility final volume calculations and as-built survey, as applicable.
- Design Engineer's Notice of Completion Letter. *See Public Works Standard Forms.*
- Approved Record "As-Built" Drawings, Approval Date: _____
- An electronic copy of the Approved Record Drawings (pdfs and in AutoCAD or approved other) with reference to at least two Oregon North NAD 83 State Plane Coordinates and reference to the NAVD88 vertical datum. Questions on format or obtaining state plane coordinates should be addressed to the Public Works Department at (503) 769-2919.
- Approved Standard Public Improvement Maintenance / Warranty Bond (1-yr), No. _____. *See Public Works Standard Forms.*
- Approved Standard Privately Financed Public Improvement Stormwater Facility Maintenance / Warranty Bond, No. _____, as applicable. *See Public Works Standard Forms.*

Submitted By:	Date:
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CERTIFIED IMPERVIOUS SURFACE AREA INVENTORY AND STORMWATER QUALITY FACILITY INFORMATION SHEET

(to be submitted with the Site Development Permit Application)

ENGINEER / ARCHITECT INFORMATION

Name: _____ Contact: _____

Address: _____ Phone/Fax: _____

Email: _____ License No.: _____

PROJECT INFORMATION

Project Name: _____

Site Address: _____ Closest Intersecting Streets: _____

Tax Lot No.: _____ Tax Lot Map No.: _____

Total Acreage (to the nearest 1/10th of an acre total disturbance limits): _____

New Proposed Number of Lots in Subdivision / Partition: _____

IMPERVIOUS SURFACE AREA INVENTORY (in square feet)

Existing Impervious Area (sq. ft): _____

Existing Impervious Area Removed (sq. ft): _____

Existing Impervious Area Retained (sq ft): _____

New Impervious Area Proposed sq ft: _____ (public) _____ (private)

Total Impervious Area (sq. ft): _____

Pervious Pavement / Pavers (sq ft): _____

New Proposed In Existing Right-of-Way (sq ft): _____

STORMWATER QUALITY FACILITY INFORMATION (see City of Portland SWMM)

Proposed Facility Types:

- | | |
|--|--|
| <input type="checkbox"/> Basin | <input type="checkbox"/> Planter / Sand Filter |
| <input type="checkbox"/> Pond (wet, extended wet, dry) | <input type="checkbox"/> Filter Strip |
| <input type="checkbox"/> Swale | <input type="checkbox"/> Soakage Trench / Drywell |
| <input type="checkbox"/> Grassy Swale | <input type="checkbox"/> Manufactured Treatment Technology |
| <input type="checkbox"/> Pervious Pavement / Pavers | <input type="checkbox"/> Other: _____ |

Treatment Area Size:

Treatment Area (sq. ft): _____

Treatment Volume (ponds, cu. ft): _____

Treatment Length (swale, ft): _____

By my signature, I certify that the supplied information above is in compliance with the Stayton Public Works Standards and correct to the best of my knowledge.

Authorized Signature: _____ **Date:** _____



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PLAN REVIEW CHECKLIST

GENERAL REQUIREMENTS

- Approved Application Completed
- Conditions of Approval Met
- Stormwater Report and Calculations
- Soils Report/Subgrade Evaluation, if applicable
- Traffic Impact Analysis or Assessment Letter
- Quantities/Engineer's Cost Estimate
- Design Plans
 - Cover-Site, Vicinity, Abbreviation, Legend
 - General Construction Notes
 - Overall Site Plan
 - Street (Plan and Profiles)
 - Composite Utility Plan
 - Water, Storm and Sanitary (Plan and Profiles), (Electricity, Phone, Gas crossings on storm and sanitary plans and profiles)
 - Stormwater Facilities
 - Grading/Erosion Control
 - Landscaping
 - Structures
 - Traffic Control
 - Signing and Striping
 - Details
- Format
 - 22" x 34" Sheet Size
 - Scale
 - North Arrow
 - Bench Mark
 - Title Block (Engineer, Owner, Project, Sheet)
 - PE Stamp
 - Revisions
 - Dated
 - Approval Block

DESIGN CALCULATIONS *(as applicable)*

- Storm Drainage
- Drainage Basin Contour Map
- Offsite Drainage
- Inlet Capacity vs. Actual Flow
- Floodplain Location
- Under Drain Requirements, if Applicable
- Traffic Study/Impact (ADT, Speed, Classification)
- Pavement Section



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GENERAL NOTES

- Applicable Utility Standards
- Special Site Conditions
- Compaction Requirements
- Erosion Control Methods, Time Limits
- Tree Cutting Allowed?
- Construction Methods (Limits, Time And Physical)
- Utility Coordination
- Testing and Inspection Requirements (Soil, Pipe, Waterline)
- Offsite Roads Clean and Dust Control
- Existing Utility Location Verification
- Material Specifications (E.G. Concrete, Pipe)
- Cut and Fill Requirements
- Benchmark
- Demolition
- Restoration of Site
- Contractor's Permits to be Secured

PLAN VIEW

- R/W, Property Lines Survey Monuments (Existing & Proposed)
- Easements (Slope, Utility, Access)
- Subdivision Name, Lot #, Tract Lines, Street Names
- Centerline with Stationing (Existing & Proposed)
- Curb & Sidewalk (Ramps & Elevations)
- Horizontal Curve Data (Including Curve Radius, Length and Delta with Elevations at 1/4-Deltas)
- Match Lines (With Reference Number Sheet)
- Survey (Existing & Proposed)
- Toe & Top of Slopes
- Pedestrian/Bicycle Path
- Cross Section Locations
- Mailboxes
- Drainage Arrows
- Crown Lines (Except Centerline)
- Intersection Centerline Stationing
- Existing Features (Adjusted, Removed, Relocated, Remain)
- Utilities (Existing & Proposed)
 - W, SS, SD, G, T, E, TV
 - Vaults & Conduit Type
 - Streetlights, Junction Boxes
 - Connections, meters, MH, CB, etc.
- Traffic Control
 - Signing & Striping (Construction & Permanent)
 - Phased Construction Plan
 - Signal Details
 - Barricades



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- Grading Plan
 - Contours (Existing/proposed)
 - Sedimentation Control
 - Cross Sections
 - Erosion Control (Structures & Planting)
 - Trees & Shrubs (Existing & to be removed))
 - Roof Drainage
 - Building Pad and finish floor Elevations

PROFILE VIEW

- Street Name (Utility Type)
- Station Grade And Elevation (PC, PT, PI, INTX, High Point, Low Point, Grade Break)
- Vertical Curve Data (K, Grade Change, Elevation, BVC, PIVC, EVC, Length)
- Ground at Centerline And R/W (Existing & Proposed)
- Extend Profile 200' (Street, Utility)
- Utility Profile (Storm, Water, And Sanitary) Invert And Rim Elevation
- Utility Crossing, (SS, SD, W, G, E, T, TV)
- Curb Return Profile
- Grade Breaks
- Backfill Class, Lengths
- Pipe Class, Lengths
- Scale (Horizontal & Vertical)

TYPICAL DETAILS / STANDARD DRAWINGS

- Typical Road Section, Right-of-Way to Right-of-Way, and Slope to Original Ground, Including Typical Utility Locations
- Utility (W, SS, SD, E, G, T, TV)
- Manhole, Catch Basin, Trench, Inlet/Outlet Structures
- Fire Hydrant, Trench Intersection
- Landscaping
- Sidewalk, Driveway, Curb
- Special Details, Structures
- Survey Monument Box



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PUBLIC IMPROVEMENTS PRELIMINARY PUNCH-LIST ITEM CHECKLIST

*The Design Engineer shall notify the City and request a final verification walk-through once the project is believed to have been completed in accordance with the approved plans, Stayton Municipal Code (SMC), and Public Works Standards (PWS). **The Design Engineer's Notice of Completion letter accompanied by the appropriate supporting documentation may serve as a request to the City for final verification walk-through of the project.** The following preliminary punch-list item checklist may be used by the Design Engineer to verify completeness and may be used by the City during the project's final verification walk-through; however, any omissions from this punch-list item checklist does not in any way relieve the Developer, Design Engineer, or the Contractor from their responsibility to comply with the conditions of approval, Stayton Municipal Code, Public Works Standards, and applicable permits, laws, and regulations.*

Certifications, Plans, and Submittals

- YES N/A The Design Engineer shall provide the following (*See below and Public Works Standard Forms for more information*):
- Notice of Completion Letter;*
 - Final Certification Reports;*
 - Any Easements and/or Right-of-Way Dedications (that are not included in the Preliminary Plat);*
 - Record Drawings;*
 - Other supporting documentation as appropriate or directed, etc.*

- YES N/A The Design Engineer shall provide reproducible Record Drawings, incorporating all approved changes. *A hard copy of the Preliminary Record Drawings shall be submitted prior to the final verification walkthrough.* The Record Drawings shall accurately represent what was constructed and shall be drafted in the same manner as the original plans with clear indication of all modifications (strike out old with new added beside). The Record Drawings shall include all private and public easement information and shall include the following list of items:
- Place the words "Record Drawing" as the last entry in the revision blocks of each sheet along with the day, month, and year the Record Drawing was prepared.*
 - Show all public and private easements on the plans and list the easement recording references, if known. The easements created when the plat is recorded shall have a blank line reserved for the reference number that can be handwritten on the plans at a later date.*
 - Show actual location and depth from finish grade of any other utilities encountered during construction on both plan and profiles.*
 - Verify that grading for all lots matches the approved grading plan, including verification of slopes. Show where grading revisions were made.*
 - Show the City's approved street names. The City street name should be shown in parenthesis next to the construction plan street names (to allow for future reference to inspection reports, CCTV reports, etc).*
 - Show all final street lighting, mailbox clusters, and other above ground features.*



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YES N/A The Design Engineer shall provide a final report/letter certifying that the project has been graded and compacted in accordance with the approved grading plans and specs. Provide a written summary of all areas where grading and compaction does not meet the approved plans and specs and documentation regarding City approval for modifying the grading plans. The Record Drawings shall show where any grading revisions were made. Provide written copies of all required project compaction test results including, but not limited to:

- Engineered Fills;*
- Trench Backfills;*
- Prepared Subgrades;*
- Aggregate Baserock;*
- Asphalt Concrete Pavement;*
- Others as directed, etc.*

YES N/A The Design Engineer shall provide a final report/letter certifying that the project utilities have been tested and inspected in accordance with the approved plans and specs. Provide a written summary of all project utilities that do not meet the approved plans and specs and information regarding City approval for modifying the plans. Provide written copies of all required project utility test reports and CCTV inspection reports/DVDs, including, but not limited to:

- Mandrel Tests;*
- Pressure Tests;*
- Bacteriological Tests;*
- MH Vacuum Tests;*
- Sanitary Sewer CCTV Inspections/DVDs;*
- Storm Facility post construction infiltration tests;*
- ADA Sidewalk Ramp Inspections;*
- Others as directed, etc..*

YES N/A The Design Engineer shall provide a final report/letter certifying the construction and functional operation of the stormwater quality and/or detention/retention facilities, as applicable. Verify final record drawing survey information is provided on the plans for the berms, inlets/outlets, emergency overflow locations and weir elevations, pollution/outlet flow control manhole orifice size, depth, etc.

YES N/A The Design Engineer shall provide written documentation of final approval from other agencies having jurisdiction over the work, including but not limited to the following. The Design Engineer shall submit a copy of the required DEQ certification submittal for the gravity sanitary sewer system.

- Marion County Building Official;*
- Marion County Public Works;*
- ODOT;*
- DEQ;*
- COE/DSL;*
- Fire District/Fire Code Official;*
- Others as directed, etc.*



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- YES N/A The Geotechnical or Design Engineer shall provide a final report/letter certifying that the engineered fill placed within the building envelopes of all lots have been compacted in accordance with applicable Building and Specialty Codes.
- YES N/A The Project Surveyor shall provide a letter certifying that the subdivision monuments have been (or will be) set in accordance with the Final Plat Map, SMC, and ORS92. Verify that all exterior property pins and street monumentation has been set, where applicable, and that any existing survey monuments disturbed during construction were replaced by a licensed surveyor. If post-monumentation, provide to the City a post-monumentation certificate and identification of corners to be post-monumented, along with a schedule showing when the monumentation will be set.
- YES N/A Verify that all debris, excess construction materials, and excess fill material has been removed from the site. Verify the streets, sanitary sewer and storm drainage system has been cleaned prior to provisional acceptance.
- YES N/A Verify any outstanding billings for City costs, including but not limited to, any applicable permit fees, legal and administrative costs, engineering costs, etc., has been satisfactory paid to the City.
- YES N/A Verify that all project and final plat conditions of approval have been met. *See Plat Review Pre-Submittal Checklist.*
- YES N/A Provide the City with a public improvement Warranty Bond (generally 30 percent of the Construction Bond amount). The Warranty Bond shall be for the full 1-year warranty period and shall not commence until:
- The final punch-list items have been completed and verified by the City (including submittal of Record Drawings), and;*
 - An acceptable public improvement Warranty Bond has been received and approved by the City; and,*
 - An acceptable privately financed public Stormwater Facility Warranty Bond has been received by the City, if applicable, and;*
 - The City has issued a written notice of provisional acceptance of the public improvements.*

Streets

- YES N/A Verify that all required subgrade, base, and asphalt compaction testing has been completed and found to be satisfactory. *See Certifications, Plans and Submittals checklist above.*
- YES N/A Verify site distance requirements have been meet.
- YES N/A Verify that all streets are clean of mud, debris and gravel.



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YES N/A Verify that all asphalt pavements, including trench patching, is complete. Verify all asphalt pavement joints between existing and new roadways have been sand sealed. Verify that finish shoulder rock is installed and graded smooth along all the roadways.

YES N/A Verify that all curb, gutter, sidewalk, and pedestrian ramps have been installed and complete.

- Verify that the curbs are stamped (S, W, D) where laterals cross. If curbs were not stamped when installed, the letters will need to be routed in.*
- Verify construction of all pedestrian ramps and all designated sidewalks have been installed as indicated on the approved plans and that they comply with ADA requirements. Verify ramps have truncated domes, style and color per the approved plans.*
- Verify that all curb weepholes installed in sidewalk areas have been extended beyond the back of sidewalk. Verify that two weepholes per lot were installed as required, including one near the low end of the lot.*
- Verify dead end sidewalks have been tied into roadways with asphalt ramps.*
- Verify curbs and sidewalks have been backfilled.*

YES N/A Verify that all-weather access roads for on and offsite fire/emergency, water, sanitary sewer, and storm drainage systems have been completed.

YES N/A Verify that all required guardrails and fences have been installed for roadways and pedestrian/bike paths.

Street Signs, Barricades, Bollards, and Pavement Markings

YES N/A Verify that all required street signs have been installed as indicated on the approved plans. Verify all traffic signs and street names/wording.

YES N/A Verify that all "No Parking Fire Lane" signs are installed and approved by the Fire Department.

YES N/A Verify that all sign post tops do not extend more than 1" above top of the upper sign panel, and that post caps are installed. Verify the sign distances from the sidewalk to the bottom of the lowest sign for possible vertical clearance issues (7' clear).

YES N/A Verify that all required bollards have been installed per the approved plans.

YES N/A Verify that barricades have been installed at dead-end streets and sidewalks, as applicable, at the project boundaries.

YES N/A Verify that all striping and pavement markings/markers are installed, and traffic indicators completed.



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Street Lighting, Traffic Signals, and Franchise Utilities

- YES N/A Verify that all streetlights and traffic signals have been installed, are plumb, and have been energized and operational. Verify any conflicts with property lines and sidewalks. Verify if there are any overhead utilities crossing property lines that need to be tied into underground.
- YES N/A Verify that the grout pad is in place beneath all streetlight and traffic signal pole concrete bases and that the bolt covers are in place.
- YES N/A Verify that all utility pull box lid hold down bolts are installed, that all pull boxes have bottom barriers installed, and all utility boxes are adjusted to grade.
- YES N/A Verify with franchise utility companies that the installation of the on-site franchise utilities has been completed.

Street Landscaping and Pedestrian Paths/Trails

- YES N/A Verify that all pedestrian paths/trails have been completed per the approved plans and that all required trail surfacing, signage, and drainage provisions have been completed.
- YES N/A Verify that all street trees have been installed per the approved plans and SMC requirements.
- YES N/A Verify the installation of all landscape improvements as indicated on the approved plans.
- YES N/A Verify that any/all required soil samples and reports have been submitted to the City.

Water Distribution System

- YES N/A Verify that all required water distribution system pressure tests, disinfection, bacteriological and associated testing has been completed and found to be satisfactory. *See Certifications, Plans and Submittals checklist above.*
- YES N/A Water Main Valves:
- Verify proper operation of all valves and that all valves are in the open position.*
 - Verify that all valve boxes are clean of debris and the operating nut is accessible.*
 - Verify that all valve boxes are set to finish grade and centered on the valve nut. Valves in sidewalk areas should be at finish sidewalk grade, including the fire hydrant valves.*
 - Verify that toner wire is looped up into and accessible in all valve boxes.*
 - Any valves not entirely in asphalt pavement or sidewalk areas shall have concrete or asphalt pavement collars around the valve box per the City's standard drawings.*



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- YES N/A Fire Hydrants:
- Verify proper operation of all fire hydrants.
 - Verify fire hydrants have factory powder coating or painting with the correct color.
 - Verify the heights of the fire hydrant traffic flanges are between 2 and 8-inches above final grade (assume that the ground slopes up at 2% from the top of curb to the back of the sidewalks).
 - Verify that Storz adapters have been installed, if applicable.
 - Verify that the Fire Department and/or Fire Code Official have approved all fire hydrant installations and that all fire hydrant flow test data has been performed and provided to the City.

- YES N/A Water Services and Meter Boxes:
- Verify that each lot has a separate water service with meter box and touch read lids (with provide proper touch read meter box plugs).
 - Verify that all meter boxes have been properly set to grade and correctly positioned with regards to R/W and property lines, sidewalks, and other utilities.
 - Verify meter stop is correctly positioned in the meter box.

- YES N/A Blowoffs, CARV Assemblies, and Water Sampling Stations:
- Verify proper installation and operation of all CARV and Water Sampling Stations and that the valves are in the open position following the test.
 - Verify proper installation and operation of all blowoff valves and that the blowoff valves are in the closed position following the test.
 - Verify the blowoff assembly end piping has been properly capped.
 - Verify that all valve boxes are clean of debris and the operating nut is accessible.

Sanitary Sewer System

- YES N/A Verify that all required air pressure testing, mandrel testing, MH vacuum testing, and CCTV inspections have been completed and found to be satisfactory. *See Certifications, Plans and Submittals checklist above.*

- YES N/A Verify that the sanitary sewer system is clean of mud, debris and gravel.

- YES N/A Verify all property line and main line cleanouts have the installed and have the appropriate covers and plugs per the approved plans.

- YES N/A Sanitary Sewer Manholes:
- Verify that all manholes are clean of mud, gravel, and debris and have been sealed/grouted inside at all pipe penetrations, manhole barrel, riser, and cone joints, pickholes, grade rings, around frame, etc., and finished smooth so they will not trap debris.
 - Verify that all manholes are raised to grade. Verify manholes in easements are to grade and have tamperproof lids with bolts installed.
 - Verify that all pipes have been trimmed flush with the inside wall of all structures, and that all excess joint seal compound has been trimmed & removed.



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- Verify manhole channeling is complete and satisfactory.
- Verify manhole steps are provided and in the correct position (e.g. upstream side), verify top and bottom locations, verify spacing.
- Verify 2-hole sewer manhole lids are provided and set flush.

YES N/A Verify that all sanitary sewer service laterals are in place with tracer wires installed, and the 2 x 4s at the end are painted green and labeled with the depth to the pipe ends.

Storm Drainage and Grading/Erosion Control

YES N/A Verify all required mandrel testing has been completed and found to be satisfactory. See *Certifications, Plans and Submittals checklist above*.

YES N/A Verify finish grading has been performed, including behind curbs and sidewalks, and conforms to the approved plans. Verify all required testing has been completed and found to be satisfactory. See *Certifications, Plans and Submittals checklist above*.

YES N/A Verify permanent erosion control measures are in conformance with the approved plans and the DEQ 1200-C permit, including but not limited, to silt fencing, mulching/seeding all disturbed areas on and off site, bio-bags and/or silt sacks for catch basins, etc. Erosion control measures will need to be maintained until adequate ground cover is established (next spring).

YES N/A Verify that the storm drainage system, including sumps of all new inlets, are clean of mud, gravel, and debris. Verify inlet sump depth following storm drainage system cleaning (contractor to notify the City on the cleaning schedule to allow sumps to be verified before silt sacks are re-installed).

YES N/A Inlets/Catch Basins:

- Verify inlets have been installed at the proper locations and with the proper invert elevations per the approved plans.
- Verify inlets have the correct inlet opening, grates and covers.
- Verify pipe grouting has been performed and sumps have been installed.

YES N/A Storm Drain Manholes:

- Verify that all manholes are clean of mud, gravel, and debris and have been sealed/grouted inside at all pipe penetrations, manhole barrel, riser, and cone joints, pickholes, grade rings, around frame, etc., and finished smooth so they will not trap debris.
- Verify that all manholes are raised to grade. Verify manholes in easements are to grade and have tamperproof lids with bolts installed.
- Verify that all pipes have been trimmed flush with the inside wall of all structures, and that all excess joint seal compound has been trimmed & removed.
- Verify manhole channeling is complete and satisfactory.
- Verify manhole steps are provided and in the correct position (e.g. upstream side), verify top and bottom locations, verify spacing.
- Verify 16-hole storm drain manhole lids are provided and set flush.



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- YES N/A Verify that all storm drainage service laterals are in place with tracer wires installed, and the 2 x 4s at the end are labeled with the depth to the pipe ends.

Stormwater Quality/Quantity Facilities

- YES N/A Verify that all stormwater facilities are clean of debris and fully operational.
- YES N/A Verify that the pollution/outlet flow control manhole conforms to the plans, including orifice size, depth, and overflow provisions. Verify any required shear gates or plugs are installed and functional.
- YES N/A Verify that all stormwater facilities volumes are as designed.
- YES N/A Verify that all stormwater facilities with side slopes of 2:1 or greater or a depth greater than 30" are fenced.
- YES N/A Verify freeboard and emergency overflow provisions have been provided.
- YES N/A Verify outfalls are per the approved plans, including riprap size, depth, and placement. Verify armoring is provided for the emergency overflow system.
- YES N/A Verify that all stormwater quality and quantity facility plantings have been installed per the approved plans.

Miscellaneous

- YES N/A Verify all off site work and surface restoration has been completed.
- YES N/A Verify that all USPS Mailbox pads/units have been installed as noted on the approved plans and as approved by the USPS.
- YES N/A Verify any damage to new facilities, i.e., PCC sidewalks, curbs, gutters, pedestrian ramps, street lighting, etc has been repaired and found to be satisfactory.
- YES N/A Verify that all domestic wells onsite have been abandoned per the Oregon Water Resource Department requirements and verify any water rights have been documented and assigned as required by the SMC.
- YES N/A Verify that all underground tanks found onsite have been removed or cleaned, backfilled and capped, and/or abandoned as per applicable permits, rules, and regulations.
- YES N/A Verify that all septic tanks and drain fields have been removed or cleaned, backfilled and capped, and/or abandoned as per Marion County Sanitation requirements.

**SAMPLE DESIGN ENGINEER'S NOTICE OF COMPLETION LETTER AND
REQUEST FOR FINAL INSPECTION**

(Date)

City of Stayton
Department of Public Works
362 N. Third Avenue
Stayton, OR 97383

RE: *Notice of Completion Letter and Request for Final Inspection for the* _____
(Project Name and Number)

All construction testing required by the City of Stayton Public Works Standards and the Site Development Permit has been completed for the above referenced Project. The subject tests indicate that the Project has been constructed in accordance with applicable City standards and is in compliance with the following documents relating to the required testing of new infrastructure.

This letter, accompanied by the following required documents, serves as a request to the City for final inspection:

- Certified Test Results.
- Final Certification Reports.
- Easement(s) and/or Right-of-Way Dedication(s), signed by the Grantor.
- Preliminary Record Drawings.
- Other as Noted: _____

Engineer of Record's Signature

Date

*Affix PE
Stamp Here*

Enclosures



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

DESIGN MODIFICATION REQUEST FORM

A Design Engineer may request a modification to the Stayton Public Works Standards relating to, and only for, a specific project by submitting this written request for such modification to the City. A design modification may be requested during design or construction and the written request shall state the desired modification, the reason for the requested modification, the conditions in Stayton Public Works Design Standards Section 101.09.C.3 that apply to the desired modification, and a comparison between the City Standard and the modification as far as performance and maintenance requirements. **When a Design Modification Request involves or will have an impact on public safety, the City will rule in the direction of public safety.**

DESIGN ENGINEER INFORMATION

Company Name: _____	Contact Name: _____
Address: _____	Phone No.: _____
Email _____	PE License No.: _____

PROJECT INFORMATION

Project Name: _____	
Site Address: _____	
Closest Intersecting Street: _____	Tax Lot & Map No.: _____

DESIGN MODIFICATION REQUEST INFORMATION

Primary Reason for this Design Modification Request (check all that apply):					
<input type="checkbox"/> Streets and Alleyways	<input type="checkbox"/> Water System	<input type="checkbox"/> Sanitary Sewer	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Other	
If this Design Modification Request involves Streets and Alleyways, then also complete the following:					
Functional Classification:	<input type="checkbox"/> Arterial	<input type="checkbox"/> Collector	<input type="checkbox"/> Neighborhood Collector	<input type="checkbox"/> Local	<input type="checkbox"/> Other
Current ADT (Year):	_____	Design ADT (Year):	_____		
Posted Speed:	_____ mph	Design Speed:	_____ mph		
Streets and Alleyways Design Modification (check all that apply):					
<input type="checkbox"/> Design Speed	<input type="checkbox"/> Lane Width	<input type="checkbox"/> Bridge Rail			
<input type="checkbox"/> Horizontal Alignment	<input type="checkbox"/> Parking Width	<input type="checkbox"/> Pavement Design Life			
<input type="checkbox"/> Vertical Alignment	<input type="checkbox"/> Bike Lane/Multi-Use Path Width	<input type="checkbox"/> Vertical Clearance			
<input type="checkbox"/> Intersection Sight Distance	<input type="checkbox"/> Median Width	<input type="checkbox"/> Superelevation			
<input type="checkbox"/> Stopping Sight Distance	<input type="checkbox"/> Length of Cul-de-Sac	<input type="checkbox"/> Superelevation Runoff			
<input type="checkbox"/> Intersection / Driveway Spacing	<input type="checkbox"/> Shy Distance from Fixed Objects	<input type="checkbox"/> Clear Zone			
<input type="checkbox"/> Pavement Cross Slope	<input type="checkbox"/> ADA Standards	<input type="checkbox"/> Sidewalk Width ¹			
<input type="checkbox"/> Grade	<input type="checkbox"/> Bridge Width	<input type="checkbox"/> (Other)			
¹ Needs a Sidewalk Modification from Planning.					

Conditions in PWDS Section 101.09.C.3 that apply to this Desired Modification (check all that apply):

- The Standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue economic hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety, accessibility, or anticipated life of facility.
- A change to a Standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

Location of Requested Design Modification:

Current Standard(s):

Design Modification Being Requested:

Reasons for Not Meeting Standard: *(such as cost/benefit, crash history, environmental, existing cross slope, etc.)*

Effect on Other Standards:

Compatibility with Adjacent Sections and Context

Comparison between the Standard and the Modification: *(as far as performance and maintenance requirements)*

Supporting Documentation *(include the appropriate plan section, cross section, alignment sheets & plan details):*



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

DESIGN ENGINEER AUTHORIZED SIGNATURE

By my signature, I certify that the above supplied information is correct to the best of my knowledge.

Prepared By: _____ **Date:** _____
Design Engineer Signature

Print Name



CITY APPROVAL STATUS

- Approved
- Approved with Conditions (*conditions below or on attached sheet*)
- Denied (*as stated below or on attached sheet*)

Comments/Conditions:

Concurred By: _____ **Date:** _____
City Engineer Signature

Approved By: _____ **Date:** _____
Public Works Director Signature



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

PROPOSED REVISIONS TO THE PUBLIC WORKS STANDARDS

Name: _____ Date: _____

Agency/Firm: _____ Telephone Number: _____

Please briefly describe your proposed revisions here: _____

Attachments: (Please list any attachments you are sending with this form.)

1. INSTRUCTIONS FOR PROPOSING PUBLIC WORKS STANDARDS REVISIONS:

Submit a "red-lined" hard copy of the proposed revisions by mail or deliver to the City at the address indicated below. An electronic scanned copy is also requested (optional) but a hard copy is needed for review.

2. PROPOSED REVISIONS CAN BE MAILED OR DELIVERED TO THE FOLLOWING:

City of Stayton, Public Works Department, 362 N. Third Avenue, Stayton, OR 97383, Phone: (503)769-2919.

**CITY OF STAYTON
STANDARD PUBLIC IMPROVEMENT CONTRACT
BID BOND**

Bond No.: _____

Project: _____

Total Bid Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),
(ten (10%) percent of the Total Bid Amount), lawful money of the United States of America, for the payment which well and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal has submitted its proposal or bid to the CITY OF STAYTON in response to CITY OF STAYTON'S Bid Advertisement for the above-referenced Project, which proposal or bid is made a part of this bond by reference, and Principal is required to furnish bid security in an amount equal to ten (10%) percent of the total amount of the bid pursuant to the procurement document and ORS 279C.365(5) for competitive bidding or 279C.400(5) for competitive proposals;

NOW, THEREFORE, if the proposal or bid submitted by Principal is accepted, and if a written contract pursuant to the proposal or bid is awarded to Principal, and if Principal enters into and executes such Contract within the time specified in the procurement document and executes and delivers to the CITY OF STAYTON its good and sufficient performance and payment bonds required by the CITY OF STAYTON, as well as any required proof of insurance, within the time fixed by the CITY OF STAYTON, then this obligation shall be void; otherwise, it shall remain in full force and effect, and the Surety hereby agrees to pay to the CITY OF STAYTON the said sum as liquidated damages, within ten (10) days of such failure.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20_____.

PRINCIPAL: _____

SURETY: _____

By _____

Signature

BY ATTORNEY-IN-FACT:

[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____

Corporation Secretary

Address

City

State

Zip

Phone

Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.

**CITY OF STAYTON
PERFORMANCE BOND
(for Standard Publicly Financed Public Improvements)**

Bond No.: _____

Project: _____

Total Contract Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),

(one-hundred (100%) percent of the Total Contract Amount), lawful money of the United States of America, for the payment which well and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal has entered into a Contract with the CITY OF STAYTON, the plans, specifications, terms and conditions of which are contained in the above-referenced Project's Contract Documents; and,

WHEREAS, the terms and conditions of the Contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of Contract prices, are made a part of this bond by reference, whether or not attached to the Contract (all hereafter called "Contract"); and,

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety;

NOW, THEREFORE, if the Principal herein shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things undertaken by Contractor to be performed under the Contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the Contract, with or without notice to the Surety, and shall assume the defense of, indemnify and save harmless the CITY OF STAYTON, its consultants, officers, employees and agents, against any direct or indirect damages or claim of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Principal or its subcontractors, and shall in all respects perform said Contract according to law, then this obligation is to be void; otherwise, it shall remain in full force and effect.

The Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the Contract Documents accompanying the same, shall in any way affect its obligations of this bond; and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work, or to the Contract Documents.

Nonpayment of the bond premium will not invalidate this bond, nor shall the CITY OF STAYTON be obligated for the payment of any premiums.

This bond is given and received under authority of ORS Chapter 279C, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

SURETY: _____

By _____
Signature

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____
Corporation Secretary

Address

City State Zip

Phone Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.

**CITY OF STAYTON
PAYMENT BOND
(for Standard Publicly Financed Public Improvements)**

Bond No.: _____

Project: _____

Total Contract Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),
(one-hundred (100%) percent of the Total Contract Amount), lawful money of the United States of America, for the payment which well and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal has entered into a Contract with the CITY OF STAYTON, the plans, specifications, terms and conditions of which are contained in the above-referenced Project's Contract Documents; and,

WHEREAS, the terms and conditions of the Contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of Contract prices, are made a part of this bond by reference, whether or not attached to the Contract (all hereafter called "Contract"); and,

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety;

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things by it undertaken to be performed under said Contract and any duly authorized modifications that are made, upon the terms set forth therein, and within the time prescribed therein, or as extended therein as provided in the Contract, with or without notice to the Sureties, and shall assume the defense of, indemnify and save harmless the CITY OF STAYTON, its consultants, officers, employees and agents, against any claim for direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Principal or its subcontractors, and shall promptly pay all persons supplying labor, materials or both to the Principal or its subcontractors for prosecution of the work provided in the Contract; and shall promptly pay all contributions due the State Industrial

Accident Fund and the State Unemployment Compensation Fund from the Principal or its subcontractors in connection with the performance of the Contract; and shall pay over to the Oregon Department of Revenue all sums required to be deducted and retained from the wages of employees of the Principal and its subcontractors pursuant to ORS 316.167, and shall permit no lien nor claim to be filed or prosecuted against the CITY OF STAYTON, its consultants, officers, employees and agents on account of any labor or materials furnished; and shall do all things required of the Principal by the laws of this State, then this obligation shall be void; otherwise, it shall remain in full force and effect.

The Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the Contract Documents accompanying the same, shall in any way affect its obligations of this bond; and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work, or to the Contract Documents.

Nonpayment of the bond premium will not invalidate this bond, nor shall the CITY OF STAYTON be obligated for the payment of any premiums.

This bond is given and received under authority of ORS Chapter 279C, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

SURETY: _____

By _____
Signature

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____
Corporation Secretary

Address

City State Zip

Phone Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.

**CITY OF STAYTON
PERFORMANCE BOND
(for Standard Privately Financed Public Improvements)**

Bond No.: _____

Project: _____

Engineer's Estimate Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),
(one-hundred twenty-five (125%) percent of the Total Engineer's Estimate), lawful money of the United States of America, for the payment which well and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal has applied to the CITY OF STAYTON for a permit to construct public improvements at _____,
Location and Description of Work

under the provisions of the CITY OF STAYTON Municipal Code and Public Works Standards; and,

WHEREAS, said permit will issue, if at all, subject to and upon certain conditions, directions, stipulations, terms, provisions and requirements provided for therein, said permit is hereby made a part of this bond to the same extent and effect as if written herein and specific reference now made to all the terms, provisions, standards, specifications and requirements set out, declared and provided for in said permit;

NOW, THEREFORE, if the Principal or its successors shall faithfully and truly observe the terms, provisions, conditions, stipulations, directions and requirements of said permit, whether or not said permit has been issued, and shall in all respects, whether the same be enumerated herein or not, faithfully comply with the same and shall assume the defense of, indemnify and save harmless the CITY OF STAYTON, its consultants, officers, employees and agents from all claims, liabilities, loss, damage or injury which may have been suffered or claimed to have been suffered to persons or property directly or indirectly resulting from or arising out of the operations or conduct of the Principal or its successors or any Contractor or subcontractor in the performance of the work under said permit and shall indemnify and make whole the CITY OF STAYTON, its consultants, officers, employees and agents for any injury or damage to any and all public infrastructure, facilities, property, or any part thereof, resulting from the operations or conduct of the Principal or its successors or any Contractor or subcontractor in connection with the performance or conduct of the work under said permit, and shall in all respects faithfully keep and

observe all of said terms, provisions, conditions, stipulations, directions and requirements, then this obligation is void, otherwise it shall remain in full force and effect.

The Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the Contract Documents accompanying the same, shall in any way affect its obligations of this bond; and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work, or to the Contract Documents.

Nonpayment of the bond premium will not invalidate this bond, nor shall the CITY OF STAYTON be obligated for the payment of any premiums.

This bond is given and received under authority of ORS Chapter 279C, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

SURETY: _____

By _____
Signature

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____
Corporation Secretary

Address

City State Zip

Phone Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.

CITY OF STAYTON
MAINTENANCE / WARRANTY BOND
(for Standard Privately or Publicly Financed Public Improvements)

Bond No.: _____

Project: _____

Performance Bond Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),
(thirty (30%) percent of the Performance Bond Amount), lawful money of the United States of America, for the payment which well and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal entered into an agreement or agreements with the CITY OF STAYTON for public improvements at _____, which
Location and Description of Work

requires a **one (1) year** maintenance and warranty under the provisions of the CITY OF STAYTON Municipal Code and Public Works Standards, and which agreement or agreements hereby is made a part hereof as if fully copies herein;

NOW, THEREFORE, if the Principal shall maintain and remedy said work free from defects in materials and workmanship for a period of **one (1) year** following completion and acceptance by the CITY OF STAYTON, then this obligation shall be void, otherwise it shall remain in full force and effect.

Nonpayment of the bond premium will not invalidate this bond, nor shall the CITY OF STAYTON be obligated for the payment of any premiums.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

SURETY: _____

By _____
Signature

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____
Corporation Secretary

Address

City State Zip

Phone Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.

CITY OF STAYTON
STORMWATER FACILITY MAINTENANCE / WARRANTY BOND
(for 2-year Maintenance of Privately Financed Public Storm Facility Improvements)

Bond No.: _____

Project: _____

Performance Bond Amount: \$ _____

IT IS DECLARED,

that we, _____, as
Contractor

Principal, and _____, a corporation
Surety

organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Oregon, as Surety, are held and firmly bound unto the CITY OF STAYTON, a municipal corporation of the State of Oregon, in the total penal sum of

_____ dollars (\$ _____),
(thirty (30%) percent of the Performance Bond Amount), lawful money of the United States of America, for the payment which will and truly to be made, we and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal entered into an agreement or agreements with the CITY OF STAYTON for a public stormwater facility at _____, which
Location and Description of Work

requires a **two (2) year** maintenance and warranty under the provisions of the CITY OF STAYTON Municipal Code and Public Works Standards, and which agreement or agreements hereby is made a part hereof as if fully copies herein;

NOW, THEREFORE, if the Principal shall maintain and remedy said Work free from defects in materials and workmanship for a period of **two (2) year** following completion and acceptance by the CITY OF STAYTON, then this obligation shall be void, otherwise it shall remain in full force and effect.

Nonpayment of the bond premium will not invalidate this bond, nor shall the CITY OF STAYTON be obligated for the payment of any premiums.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

SURETY: _____

By _____
Signature

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

Title

Name

Address

Signature

Attest: _____
Corporation Secretary

Address

City State Zip

Phone Fax

IMPORTANT – SURETY companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the State of Oregon.



MANHOLE VACUUM TEST REPORT

Project Name _____

Location: (street and cross-street or address) _____

Contractor _____

Inspector _____

Surface Restoration Verified? Yes No Date: _____ Page: _____ of _____

MH Station or #	Street Name	Street Paved? (P or U)	MH Depth	MH Diameter	Time to Drop from 10" Hg to 9" Hg (seconds)	Required Test Times (seconds)	Results		Comments:
							Pass	Fail	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	
							<input type="checkbox"/>	<input type="checkbox"/>	

Signature _____

Witness _____

Date _____

Notes:

1. Surface restoration shall be completed, manhole lift holes shall be non-shrink grouted, and all pipes entering the manhole shall be plugged, prior to conducting manhole acceptance tests. Precautionary measures shall be taken to securely brace the plugs from being drawn into the manhole during the test.
2. The test head shall be placed at the inside of the top of the manhole frame and the seal inflated in accordance with the manufacturer's recommendations. The seal at the grade rings and frame shall be subject to the test.
3. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured and recorded for the vacuum to drop from 10-inches to 9-inches.
4. Acceptance for manholes shall be defined as when the elapsed time for negative pressure changes from 10-inches to 9-inches of mercury and meets or exceeds the required manhole vacuum test times shown.

<u>REQUIRED MANHOLE VACUUM TEST TIMES</u>			
MH Depth	Required Time (seconds)		
	4' dia.	5' dia.	6' dia.
10' or less	60 sec	75 sec	90 sec
10' – 15'	75 sec	90 sec	105 sec
15' – 25'	90 sec	105 sec	120 sec



City of Stayton

Department of Public Works
 362 North Third Avenue
 Stayton, Oregon 97383

SANITARY SEWER AIR TEST REPORT

(See City of Stayton Standard Construction Specification Section 503.01.Q)

Project Name _____ Location: (street and cross-street or address) _____ Contractor _____

Inspector _____ CCTV Inspection Required? Yes No Date: _____

Mandrel Test Completed? Yes No Mandrel Test Completed/Scheduled: _____ Page: _____ of _____

MH Station and MH Number		Mainline or Lateral	Size and Material	Total Pipe Length (ft)	C-Value*	K-Value*	Test Time (in seconds) for pressure to drop as shown (psi)		Test Results		Comments:
From	To						Required Time*	Recorded Time (3.5psig to 2.5psig)	Pass	Fail	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	
									<input type="checkbox"/>	<input type="checkbox"/>	

*See Reverse for C and K values, required test formula, and example calculations.

Signature _____ Witness _____ Date _____

TEST PROCEDURE:

1. Clean the pipe to be tested and remove debris. Plug pipe outlets with suitable test plug and brace each plug securely. Check the average height of the groundwater over the pipe. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig. Increase the internal air test pressure by 0.433 psi for each foot of average ground water depth over the invert of the pipe under test.
2. After the internal test pressure is reached, allow at least 2-minutes for the air temperature to stabilize, adding only the amount of air required to maintain pressure. After the temperature stabilization period has passed and the pressure has been elevated to the specified test pressure, disconnect the air supply.
3. Determine and record the time, in seconds, that is required for the internal air pressure to drop from 3.5 psig to 2.5 psig greater than the average backpressure of any ground water that may submerge the pipe. Compare the time recorded with the time required.



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

ACCEPTANCE: The completed sewer shall meet the requirements of the air test as specified in PWSCS 501.03.Q before being considered acceptable. The presence of ground water will affect the results of the test. Determine the average height of groundwater over the sewer immediately before starting the test; the method of checking the groundwater height shall be as approved. The tested sewer section will be considered acceptable if the recorded time is greater than the required time computed by the formula $T=K/C$, as further described below. If the tested sewer section fails to meet the air test requirements, determine the reason for leakage and repair or replace all defective materials or workmanship.

REQUIRED AIR TEST FORMULA AND PROCEDURE:

$T = K/C$

C-Value = 0.0003882 (d) (L) (see Table for values per foot of pipe length)

K-Value = 0.011 (d)² (L) (see Table for values per foot of pipe length)

Where, d = pipe diameter (inches)

L= pipe length (ft)

For total C ≤ 1.0, test time T (seconds) required = (total K)

For total C > 1.0, test time T (seconds) required = (total K / total C)

HIGH GROUNDWATER EXAMPLE CALCULATION:

Groundwater measured at 4 ft. above invert of pipe segment. Required internal pressure without groundwater = 4.0 psig. New required internal pressure is equal to 0.433 psig/ft x 4 ft + 4.0 psig = 5.7 psig.

AIR TEST FORMULA C AND K VALUES

Pipe diameter (inches)	C-Value per foot of pipe length	K-Value per foot of pipe length
4	0.00155	0.176
6	0.00233	0.396
8	0.00311	0.704
10	0.00388	1.100
12	0.00466	1.584
15	0.00582	2.475
18	0.00699	3.564
21	0.00815	4.851
24	0.00932	6.336
27	0.01048	8.019

AIR TEST REPORT EXAMPLE CALCULATION:

MH Station (MH #)		Mainline or Lateral	Size and Material	Total Pipe Length=L (ft)	C-Value	K-Value	Test Time (Seconds) for Pressure Drop Shown (psi)		Test Results	
From	To						Required	Recorded (3.5psi to 2.5psi)	Pass	Fail
0+00 (MH-1)	4+25 (MH-2)	Mainline	8" PVC	425'	1.32	299.2	340.56/1.64 = <u>208 sec</u>	<u>425 sec</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Laterals	4" PVC	145'	0.225	25.52				
		6" PVC	40'	0.093	15.84					
Totals					1.64	340.56				
4+25 (MH-2)	7+10 (MH-3)	Mainline	8" PVC	285'	0.886	200.64	223.74/1.06 = <u>211 sec</u>	<u>380 sec</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Laterals	4" PVC	75'	0.116	13.2				
		6" PVC	25'	0.058	9.9					
Totals					1.06	223.74				
7+10 (MH-3)	9+10 (MH-4)	Mainline	8" PVC	200'	0.622	140.8	<u>150 sec</u>	<u>320 sec</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Laterals	4" PVC	50'	0.078	8.8				
		Totals			0.70	149.6				



SANITARY SEWER AND STORM DRAIN MANDREL TEST REPORT

Project Name _____ Location: (street and cross-street or address) _____ Contractor _____

Inspector _____ Mandrel Diameter Verified? Yes No Date: _____ Page: _____ of _____

Date Pipe Segments Flushed and Cleaned: _____ *Separate Report Required for each Test Session.

MH Station and Number		Pipe Diameter (inches) and Material	Total Pipe Length (feet)	Backfill Compaction Completed?		Mandrel Test Results		Comments
From	To			Yes	No	Pass	Fail	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Signature _____ Witness _____ Date _____

Notes:

- Mandrel testing shall be conducted no sooner than 30 days after trench backfill and compaction has been completed. Prior to mandrel test, the Contractor shall jet rod and clean all parts of the system. Remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the system.
- Conduct mandrel testing on a manhole-to-manhole basis, and only after the manholes have been channeled.
- Mandrel test shall be conducted by pulling an approved solid pointed mandrel having at least six (6) vanes through the completed pipeline.
- Mandrel diameter shall be 95 percent of the internal pipe diameter. The inspector will verify the diameter of each mandrel used during each test session. Locate and repair any sections failing to pass the test and retest the section at the Contractor's sole expense.

ASTM D3034 – PIPE DEFLECTION LIMITS TABLE		
Pipe Nominal Diameter (in)	Mandrel Size SDR 35 (in)	Mandrel Size SDR 26 (in)
6"	5.45"	5.33"
8"	7.28"	7.12"
10"	9.08"	8.87"
12"	10.79"	10.54"



City of Stayton

Department of Public Works
362 North Third Avenue
Stayton, Oregon 97383

WATERLINE PRESSURE TEST REPORT

Project: _____ Contractor: _____ Date: _____

Inspector: _____ Test Results: Pass Fail Page: _____ of _____

SECTION OF WATERLINE TO BE TESTED

On (Street Name)	From (Street Name)	To (Street Name)	Total Footage (ft)	Pipe Diameter (in)	Type of Pipe

WATERLINE TEST LOG

Hrs.	Test Time	PSI Read	Meter	Allowable Leakage	Actual Leakage**
Start					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Leakage/12 hours (gallons):					

* Test pressure is to be maintained for a minimum of 2 hours. See reverse side for testing procedures

Inspector Signature: _____ Date: _____

TEST PROCEDURE:

1. Verify that all inline valves, including fire hydrant mainline valves, are open? **Yes / No**
2. Verify that all corp stops are open and angle meter valves closed? **Yes / No**
3. Verify that pressure gauge is mounted at high point of line to be tested? **Yes / No** If no, correct for elevation difference (ie. Add 0.433 psi per foot elevation difference.)
4. Apply hydrostatic pressure by pumping water from an auxiliary supply basin. Accurately determine the amount of water required to reach the initial test pressure by refilling the supply basin with a calibrated container following pressurization of pipeline.
5. At the completion of the test period, re-pressurize the pipeline by pumping water from the auxiliary supply basin. Accurately determine the amount of water required to reach the test pressure by refilling the supply basin with a calibrated container following pressurization of pipeline. If the measured leakage is less than the allowable leakage, the test is successful.



City of Stayton

Department of Public Works
 362 North Third Avenue
 Stayton, Oregon 97383

ALLOWABLE LEAKAGE:

ALLOWABLE LEAKAGE PER 100 JOINTS (gallons per hour)										
Average Test Pressure	Pipe Diameter (inches)									
	4	6	8	12	16	20	24	30	36	42
200	0.67	1.00	1.35	2.02	2.69	3.37	4.04	5.05	6.06	7.07
195	0.67	0.99	1.33	2.00	2.66	3.33	3.99	4.99	5.98	6.98
190	0.65	0.98	1.31	1.97	2.63	3.28	3.94	4.92	5.90	6.89
185	0.65	0.97	1.30	1.94	2.59	3.24	3.89	4.86	5.83	6.80
180	0.64	0.96	1.28	1.92	2.55	3.20	3.83	4.79	5.75	6.71
175	0.63	0.94	1.26	1.89	2.52	3.15	3.78	4.73	5.67	6.61
170	0.62	0.93	1.24	1.86	2.48	3.10	3.73	4.66	5.59	6.52
165	0.61	0.92	1.22	1.83	2.45	3.06	3.67	4.59	5.51	6.42
160	0.60	0.90	1.20	1.81	2.41	3.01	3.61	4.52	5.42	6.33
155	0.59	0.89	1.19	1.78	2.37	2.97	3.56	4.45	5.34	6.23
150	0.58	0.88	1.17	1.75	2.33	2.91	3.50	4.37	5.25	6.12

Notes:

1. If the pipeline under test contains various diameters, the allowable leakage shall be the sum of the allowable leakage for each size.
2. Regardless of leakage, maximum pressure drop during test period shall not exceed 5 psi/hour.

3. Allowable leakage based on:
$$L = \frac{N * D * P^{0.50}}{8400}$$

Where:

- L = Allowable leakage in gallons per hour (gph)
- N = Number of joints in the length of pipe tested (+)
- D = Nominal diameter of the mainline pipe in inches
- P = Test pressure during the leakage test in psi
- (+) = Each service installation completed shall constitute one joint

4. Disinfect water mains prior to hydrostatic pressure testing. Pipelines shall be tested in lengths between valves, or plugs, of not more than 1500 ft. Where specifically approved by the City, large-diameter (larger than 20-inches) pipelines may be allowed to be tested in lengths between valves, or plugs, of not more than 4000 ft.
5. Maximum allowable leakage for water mains with rubber gasketed joints is 11.63 gallons per-inch nominal diameter per-mile of pipe per-24 hours, while testing at 150 psi.



APPENDIX D

STANDARD CONSTRUCTION NOTES FOR PRIVATELY FINANCED PUBLIC IMPROVEMENTS

(NOTE: The following Standard Construction Notes shall be shown on all privately financed public improvement projects and shall be supplemented as necessary by the Design Engineer to meet the specific project needs. Unless approved otherwise, the Standard Construction Notes shall retain the numbering scheme and order shown below)

1. GENERAL

1. CONTRACTOR SHALL PROCURE AND CONFORM TO ALL CONSTRUCTION PERMITS REQUIRED BY THE CITY OF STAYTON, MARION COUNTY AND/OR ODOT, AS APPLICABLE. CONTRACTOR SHALL PROCURE A RIGHT-OF-ENTRY PERMIT FROM MARION COUNTY AND/OR ODOT FOR ALL WORK WITHIN MARION COUNTY OR STATE RIGHT-OF-WAY. CONTRACTOR SHALL CONFORM TO ALL CONDITIONS OF THE PERMIT.
2. CONTRACTOR SHALL PROCURE A RIGHT-OF-ENTRY PERMIT FROM AFFECTED RAILROADS FOR ALL WORK WITHIN THE RAILROAD RIGHT-OF-WAY AND CONFORM TO ALL CONDITIONS OF THE PERMIT.
3. CONTRACTOR SHALL PROVIDE ALL BONDS AND INSURANCE REQUIRED BY PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION.
4. MATERIALS AND WORKMANSHIP FOR FACILITIES IN PUBLIC RIGHT-OF-WAY OR EASEMENTS SHALL CONFORM TO APPROVING AGENCIES' CONSTRUCTION SPECIFICATIONS WHEREIN EACH HAS JURISDICTION, INCLUDING BUT NOT LIMITED TO THE CITY, COUNTY, OREGON DEPARTMENT OF HUMAN SERVICES (DHS) THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) AND THE OREGON DEPARTMENT OF TRANSPORTATION (ODOT).
5. UNLESS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR, CONSTRUCTION OF ALL PUBLIC FACILITIES SHALL BE DONE BETWEEN 7:00 A.M. AND 6:00 P.M., MONDAY THROUGH FRIDAY, AND BETWEEN 9:00 A.M. AND 6:00 P.M. SATURDAY.
6. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THE PROJECT IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS INCLUDING SUCH INCIDENTALS AS MAY BE NECESSARY TO MEET APPLICABLE AGENCY REQUIREMENTS AND PROVIDE A COMPLETED PROJECT.
7. CONTRACTOR TO NOTIFY CITY, COUNTY, ODOT AND ALL UTILITY COMPANIES A MINIMUM OF 48 BUSINESS HOURS (2 BUSINESS DAYS) PRIOR TO START OF CONSTRUCTION, AND COMPLY WITH ALL OTHER REQUIREMENTS OF ORS 757.541 TO 757.571.
8. ANY INSPECTION BY THE ENGINEER, CITY, COUNTY OR OTHER AGENCIES SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN STRICT COMPLIANCE WITH THE APPLICABLE CODES AND AGENCY REQUIREMENTS.



9. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE BASE MAPS PROVIDED BY (to be filled in as appropriate). EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY, PRIOR TO COMMENCEMENT OF CONSTRUCTION.
10. HORIZONTAL DATUM: STAYTON LOCAL COORDINATE SYSTEM.
11. VERTICAL DATUM: NAVD 88.
12. PRIOR TO ANY CONSTRUCTION ACTIVITY IN PUBLIC RIGHT-OF-WAY, CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN TO THE CITY AND OTHER BY PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION FOR REVIEW AND APPROVAL. CONTRACTOR SHALL ERECT AND MAINTAIN BARRICADES, WARNING SIGNS, TRAFFIC CONES PER CITY, COUNTY AND ODOT REQUIREMENTS IN ACCORDANCE WITH THE MUTCD (INCLUDING OREGON AMENDMENTS). ACCESS TO DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. ALL TRAFFIC CONTROL MEASURES SHALL BE APPROVED AND IN PLACE PRIOR TO ANY CONSTRUCTION ACTIVITY.
13. **RECORD DRAWINGS**. THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED PLANS AND SPECIFICATIONS ON THE CONSTRUCTION SITE AT ALL TIMES WHEREON HE WILL RECORD ANY APPROVED DEVIATIONS IN CONSTRUCTION FROM THE APPROVED PLANS, AS WELL AS THE STATION LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES ENCOUNTERED. THESE FIELD RECORD DRAWINGS SHALL BE KEPT UP TO DATE AT ALL TIMES AND SHALL BE AVAILABLE FOR INSPECTION BY THE CITY UPON REQUEST. UPON COMPLETION OF CONSTRUCTION OF PUBLIC FACILITIES, CONTRACTOR SHALL SUBMIT A CLEAN SET OF FIELD RECORD DRAWINGS CONTAINING ALL AS-BUILT INFORMATION TO THE DESIGN ENGINEER FOR USE IN THE PREPARATION OF RECORD DRAWINGS FOR SUBMITTAL TO THE CITY.
14. THE CONTRACTOR SHALL SUBMIT A SUITABLE WARRANTY BOND PRIOR TO FINAL PAYMENT WHERE REQUIRED BY PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION.
15. CONTRACTOR SHALL PROCURE AND CONFORM TO DEQ 1200-C OR CN STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES WHERE ONE (1) OR MORE ACRES ARE DISTURBED.
16. PER OREGON FIRE CODE (OFC 505.1), NEW AND EXISTING BUILDINGS SHALL HAVE APPROVED ADDRESS NUMBERS, BUILDING NUMBERS, OR APPROVED BUILDING IDENTIFICATION PLACED IN A POSITION THAT IS PLAINLY LEGIBLE AND VISIBLE FOR THE STREET OR ROAD FRONTING THE PROPERTY. THESE NUMBERS SHALL CONTRAST WITH THEIR BACKGROUND. NUMBERS SHALL BE A MINIMUM OF 4-INCHES HIGH WITH A MINIMUM STROKE WIDTH OF 0.5-INCH. TEMPORARY ADDRESS SIGNS SHALL BE MOUNTED IN A VISIBLE LOCATION PRIOR TO AND DURING ANY CONSTRUCTION, AND THE PERMANENT NUMBERS MOUNTED PRIOR TO OCCUPANCY.
17. PER OREGON FIRE CODE (OFC 505.2), STREETS AND ROADS SHALL BE IDENTIFIED WITH APPROVED SIGNS. TEMPORARY SIGNS SHALL BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADWAYS ALLOWS PASSAGE BY VEHICLES. SIGNS SHALL BE OF AN APPROVED SIZE, WEATHER RESISTANT, AND BE MAINTAINED UNTIL REPLACED BY PERMANENT SIGNS.



18. THE ENGINEER AND APPLICABLE AGENCY MUST APPROVE, PRIOR TO CONSTRUCTION, ANY ALTERATION OR VARIANCE FROM THESE PLANS. ANY VARIATIONS FROM THESE PLANS SHALL BE PROPOSED ON CONSTRUCTION FIELD PRINTS AND TRANSMITTED TO THE DESIGN ENGINEER AND THE CITY FOR APPROVAL.

2. EXISTING UTILITIES AND FACILITIES

1. **ATTENTION**. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-0010090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987).
2. THE LOCATION AND DESCRIPTIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEYS. THE CITY, DESIGN ENGINEER OR UTILITY COMPANIES DO NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF SUCH RECORDS. CONTRACTOR SHALL FIELD VERIFY SIZES AND LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING PROPERTY AND STREET MONUMENTS PRIOR TO CONSTRUCTION. ANY MONUMENTS DISTURBED DURING CONSTRUCTION OF THE PROJECT SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE. THE MONUMENTS SHALL BE REPLACED WITHIN A MAXIMUM OF 90 DAYS, AND THE COUNTY SURVEYOR SHALL BE NOTIFIED IN WRITING AS REQUIRED BY ORS 209.150.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE RELOCATION OF ALL BURIED AND OVERHEAD UTILITIES.
5. CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES WHERE NEW FACILITIES CROSS. ALL UTILITY CROSSINGS MARKED OR SHOWN ON THE PLANS SHALL BE POTHOLED USING HAND TOOLS OR OTHER NON-INVASIVE METHODS PRIOR TO EXCAVATING OR BORING. CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING POTENTIAL UTILITY CONFLICTS FAR ENOUGH AHEAD OF CONSTRUCTION TO MAKE NECESSARY GRADE MODIFICATIONS WITHOUT DELAYING THE WORK. IF GRADE MODIFICATION IS NECESSARY, CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER, AND THE DESIGN ENGINEER SHALL OBTAIN APPROVAL FROM THE CITY ENGINEER PRIOR TO CONSTRUCTION. ALL UTILITY CROSSINGS SHALL BE POTHOLED AS NECESSARY PRIOR TO EXCAVATING OR BORING TO ALLOW THE CONTRACTOR TO PREVENT GRADE OR ALIGNMENT CONFLICTS.
6. EXISTING FACILITIES SHALL BE MAINTAINED IN-PLACE BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR TO LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY ENGINEER.
7. UTILITIES, OR INTERFERING PORTIONS OF UTILITIES, THAT ARE ABANDONED IN PLACE SHALL BE REMOVED BY THE CONTRACTOR TO THE EXTENT NECESSARY TO ACCOMPLISH THE WORK. THE CONTRACTOR SHALL PLUG THE REMAINING EXPOSED ENDS OF ABANDONED UTILITIES.



8. CONTRACTOR SHALL REMOVE ALL EXISTING SIGNS, MAILBOXES, FENCES, LANDSCAPING, ETC., AS REQUIRED TO AVOID DAMAGE DURING CONSTRUCTION AND REPLACE THEM TO EXISTING OR BETTER CONDITION.
9. ANY SEPTIC TANKS ENCOUNTERED DURING CONSTRUCTION SHALL BE PUMPED OUT AND, REMOVED OR ABANDONED IN PLACE IN ACCORDANCE WITH STATE OF OREGON DEQ AND COUNTY SANITARIAN REQUIREMENTS.
10. ANY WELLS ENCOUNTERED SHALL BE ABANDONED PER STATE OF OREGON WATER RESOURCES DEPARTMENT REQUIREMENTS.
11. ANY FUEL TANKS ENCOUNTERED SHALL BE REMOVED AND DISPOSED OF PER STATE OF OREGON DEQ REQUIREMENTS. BACKFILL WITH COMPACTED GRANULAR MATERIAL.

3. EARTHWORK

1. UNLESS OTHERWISE NOTED, ALL EARTHWORK SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS. IN ADDITION, THE CONTRACTOR SHALL REVIEW THE SOILS REPORT PREPARED BY (to be filled in as applicable), AND CONFORM TO ALL RECOMMENDATIONS LISTED IN THE REPORT.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGING CONSTRUCTION ACTIVITIES TO ENSURE THAT PUBLIC STREETS AND RIGHT-OF-WAYS ARE KEPT CLEAN OF MUD, DUST OR DEBRIS. DUST ABATEMENT SHALL BE MAINTAINED BY ADEQUATE WATERING OF THE SITE BY THE CONTRACTOR.
3. UNLESS OTHERWISE NOTED, ANY GRADING ON THE SITE SHALL BE COMPLETED SO AS TO MAINTAIN EXISTING DRAINAGE FROM ADJACENT PROPERTIES. ALL PROPOSED ELEVATIONS SHOWN SHALL BE CONSIDERED TO BE FINISH SURFACE ELEVATIONS, UNLESS NOTED OTHERWISE.
4. CLEAR AND GRUB, WITHIN WORK LIMITS SHOWN, ALL SURFACE VEGETATION, TREES, STUMPS, BRUSH, ROOTS, ETC. DO NOT DAMAGE OR REMOVE TREES EXCEPT AS APPROVED AND AS SHOWN ON THE PLANS. PROTECT ALL ROOTS TWO INCHES IN DIAMETER OR LARGER, UNLESS OTHERWISE DIRECTED IN THE PLANS AND SPECIFICATIONS.
5. STRIP WORK LIMITS A MINIMUM OF FOUR INCHES (4") OR AS RECOMMEND BY THE SOILS REPORT, REMOVING ALL ORGANIC MATTER WHICH CANNOT BE COMPACTED INTO A STABLE MASS. ALL TREES, BRUSH AND DEBRIS ASSOCIATED WITH CLEARING, STRIPPING OR GRADING SHALL BE REMOVED AND DISPOSED OF OFF-SITE.
6. IMMEDIATELY FOLLOWING FINE GRADING OPERATIONS, COMPACT SUB GRADE TO 95 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T -180 TEST METHOD (MODIFIED PROCTOR). SUB GRADE MUST BE INSPECTED AND APPROVED BY THE CITY PRIOR TO PLACING EMBANKMENTS OR BASE ROCK.
7. FILLS WITHIN PUBLIC RIGHT-OF-WAYS AND EASEMENTS SHALL BE ENGINEERED. ADDITIONALLY, ANY FILLS OUTSIDE OF PUBLIC RIGHT-OF-WAYS WHICH ARE OVER 12-INCHES IN DEPTH SHALL BE ENGINEERED. ANY ENGINEERED FILLS OVER 12-INCHES IN DEPTH SHALL REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 1704.7 OF THE OREGON STRUCTURAL SPECIALTY CODE.



8. PLACE FILL MATERIAL UNIFORMLY ACROSS SITE TO PROVIDE POSITIVE DRAINAGE AND PREVENT LOW AREAS DURING CONSTRUCTION. PROVIDE TEMPORARY DITCHES OR SWALES AS NECESSARY TO PREVENT SURFACE WATER FROM PONDING AND TO DIRECT SURFACE WATER AWAY FROM AREA OF FILL PLACEMENT.
9. DO NOT PLACE FILL MATERIAL IF FROZEN, IF SURFACE UPON WHICH FILL IS TO BE PLACED IS FROZEN, OR DURING PERIODS OF MEASUREABLE RAIN. CONTRACTOR SHALL CONTINUALLY MONITOR AND ALTER THE MOISTURE CONTENT OF THE SOIL EITHER BY ADDING MOISTURE OR BY DRYING THE SOIL BY AERATION SUCH THAT THE MOISTURE CONTENT OF THE SOIL DOES NOT VARY BY PLUS OR MINUS TWO PERCENT ($\pm 2\%$) OF OPTIMUM. EXCAVATED TRENCH NATIVE MATERIAL, WHICH IS OF SUITABLE MATERIAL, SHALL BE PLACED AND COMPACTED AS ENGINEERED FILL.
10. ENGINEERED FILLS SHALL BE CONSTRUCTED IN 6-INCH MAXIMUM LIFTS. EACH LIFT SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T -180 TEST METHOD (MODIFIED PROCTOR). ALL SUBGRADE IN PUBLIC RIGHT-OF-WAYS SHALL BE COMPACTED TO A FIRM AND UNYIELDING CONDITION.
11. UNLESS OTHERWISE SHOWN ON THE PLANS, NO CUT OR FILL SLOPES SHALL BE CONSTRUCTED STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL.
12. PLANTER AREAS SHALL BE BACKFILLED WITH APPROVED TOP SOIL MINIMUM 12-INCH IN DEPTH. STRIPPING MATERIALS SHALL **NOT** BE USED FOR PLANTER BACKFILL.
13. CONTRACTOR SHALL SEED ALL EXPOSED SLOPES AND DISTURBED AREAS WHICH ARE NOT SCHEDULED TO BE LANDSCAPED OR RECEIVE A HARD SURFACING.
14. GRADING SHOWN ON THE PLANS IS CRITICAL TO THE FUNCTIONING OF SITE DRAINAGE AND SHALL BE STRICTLY FOLLOWED.
15. AS APPLICABLE, CONTRACTOR SHALL COORDINATE AND ENSURE THAT STORMWATER FACILITY SIZE, ELEVATION, AND DETENTION VOLUMES ARE VERIFIED AND INSPECTED BY THE DESIGN ENGINEER AND APPROVED BY PUBLIC AGENCIES HAVING JURISDICTION PRIOR TO PAVING AND LANDSCAPING.

4. **PAVING**

1. UNLESS OTHERWISE NOTED, ALL ROCKING AND PAVING SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. UNLESS OTHERWISE SHOWN ON THE PLANS, SMOOTH TRANSITIONS SHALL BE RUN BETWEEN ALL FINISH GRADE ELEVATIONS AND/OR FINISH CONTOUR LINES SHOWN. FINISH PAVEMENT GRADES AT TRANSITION TO EXISTING PAVEMENT SHALL MATCH EXISTING PAVEMENT GRADES TO PROVIDE A SMOOTH, FREE DRAINING SURFACE.
3. CRUSHED ROCK SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD CONSTRUCTION SPECIFICATIONS. COMPACT TO 95% OF THE MAXIMUM DRY DENSITY PER AASHTO T -180 TEST METHOD (MODIFIED PROCTOR). PRIOR TO PLACING AC PAVEMENT, WRITTEN COMPACTION TEST RESULTS FOR BASEROCK AND TRENCH BACKFILL MUST BE RECEIVED BY THE CITY, AND A PROOF-ROLL (WITNESSED BY THE CITY) MUST BE PERFORMED.



4. PAVING OF STREETS WILL NOT BE ALLOWED UNTIL AFTER COMPLETION OF ALL REQUIRED TESTING AND INSPECTION OF NEW WATER, SEWER AND STORM DRAIN LINES UNDER PAVED AREAS, AND REVIEW AND APPROVAL OF THE PRIVATE (FRANCHISE) UTILITY PLANS BY THE CITY ENGINEER OR HIS/HER DESIGNEE.
5. PAVEMENT SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS. ASPHALT CONCRETE PAVEMENT SHALL BE COMPACTED TO A MINIMUM OF 91 PERCENT OF MAXIMUM DENSITY (AT ALL LOCATIONS) AS DETERMINED BY THE RICE STANDARD METHOD (AASHTO T-209).
6. EXISTING OR CONSTRUCTED MANHOLES, CLEANOUTS, MONUMENTS, GAS VALVES, WATER VALVES AND SIMILAR STRUCTURES SHALL BE ADJUSTED TO MATCH FINISH GRADE OF THE PAVEMENT (PRIOR TO PAVING OPERATIONS), SIDEWALK, LANDSCAPED AREA OR MEDIAN STRIP WHEREIN THEY LIE. STORM DRAIN INLET STRUCTURES SHALL BE ADJUSTED SO WATER FLOWS INTO THE STRUCTURE WITHOUT PONDING WATER.
7. ASPHALT CONCRETE PAVEMENT WHICH DOES NOT MEET SPECIFIED COMPACTION REQUIREMENTS, AND WHICH ARE DEEMED BY THE CITY ENGINEER TO BE UNSUITABLE FOR USE, WILL BE REJECTED. ANY REJECTED MATERIAL SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

5. CURBS AND SIDEWALKS

1. UNLESS OTHERWISE SHOWN OR INDICATED ON THE PLANS, 6-INCHES NOMINAL CURB EXPOSURE USED FOR DESIGN OF ALL PARKING LOT AND STREET GRADES.
2. CONTRACTOR SHALL PROVIDE A MINIMUM 2-WEEP HOLES PER LOT IN CURB TO PROVIDE FOR LOT DRAINAGE. ONE WEEP HOLE SHALL BE LOCATED 5-FEET FROM THE PROPERTY LINE ON THE LOW POINT IN THE LOT FRONTAGE. WEEP HOLES SHALL ALSO BE PROVIDED AS REQUIRED FOR ADDITIONAL DRAINPIPES SHOWN ON THE PLANS. WEEPHOLES INSTALLED IN EXISTING CURBS SHALL BE CORE DRILLED.
3. CURBS AND GUTTERS SHALL BE STAMPED WITH AN 'SS', 'SD', OR 'W' AT THE POINT WHERE EACH SANITARY SEWER, STORM DRAIN AND WATER SERVICE LATERAL CROSSES THE CURBS AND GUTTERS, RESPECTIVELY. THE LOCATION OF GATE VALVES SHALL ALSO BE MARKED WITH A 'GV'. LETTERS SHALL BE A MINIMUM OF 2-INCHES HIGH.
4. CONTRACTOR SHALL CONSTRUCT HANDICAP ACCESS RAMPS AT ALL INTERSECTIONS IN ACCORDANCE WITH CURRENT ADA REQUIREMENTS.
5. SIDEWALKS AND DRIVEWAYS SHALL BE CONSTRUCTED TO THE FULL THICKNESS SHOWN.
6. WHERE TRENCH EXCAVATION REQUIRES REMOVAL OF PCC CURBS AND/OR SIDEWALKS, THE CURBS AND/OR SIDEWALKS SHALL BE SAWCUT AND REMOVED AT A TOOLED JOINT UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE CITY. THE SAWCUT LINES SHOWN ON THE PLANS ARE SCHEMATIC AND NOT INTENDED TO SHOW THE EXACT ALIGNMENT OF SUCH CUTS.



6. SITE UTILITIES

1. CONTRACTOR SHALL COORDINATE AND PAY ALL COSTS ASSOCIATED WITH CONNECTING TO EXISTING WATER, SANITARY SEWER AND STORM SEWER FACILITIES. CONNECTIONS BETWEEN EXISTING INFRASTRUCTURE AND NEW WORK SHALL NOT BE MADE UNTIL NECESSARY INSPECTIONS AND TESTS HAVE BEEN COMPLETED ON THE NEW WORK IS FOUND TO CONFORM IN ALL RESPECTS TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS.
2. UNLESS OTHERWISE NOTED, MATERIALS AND WORKMANSHIP FOR WATER, SANITARY SEWER AND STORM SEWER SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
3. **BEDDING AND BACKFILL.** ALL PIPES SHALL BE BEDDED WITH MINIMUM 6-INCHES OF 3/4-INCH MINUS CRUSHED ROCK BEDDING AND BACKFILLED WITH COMPACTED 3/4-INCH MINUS CRUSHED ROCK IN THE PIPE ZONE (CRUSHED ROCK SHALL EXTEND A MINIMUM OF 12-INCHES OVER THE TOP OF THE PIPE IN ALL CASES). CRUSHED ROCK TRENCH BACKFILL SHALL BE USED UNDER ALL HARD SURFACED AREAS, INCLUDING SIDEWALKS. CRUSHED ROCK BEDDING SHALL BE PLACED TO FORM A CONTINUOUS AND UNIFORM BEARING SUPPORT FOR THE PIPE AT EVERY POINT BETWEEN JOINTS. PIPE ZONE MATERIAL SHALL BE FIRST PLACED UP TO THE SPRING LINE OF THE PIPE AND MATERIAL UNIFORMLY COMPACTED BY HAND TO INSURE PROPER SUPPORT WITHIN THE PIPE HAUNCHES. GRANULAR TRENCH BACKFILL SHALL BE COMPACTED TO 92 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T -180 TEST METHOD (MODIFIED PROCTOR).
4. THE CONTRACTOR SHALL HAVE APPROPRIATE EQUIPMENT ON SITE TO PRODUCE A FIRM, SMOOTH, UNDISTURBED SUBGRADE AT THE TRENCH BOTTOM, TRUE TO GRADE. THE BOTTOM OF THE TRENCH EXCAVATION SHALL BE SMOOTH, FREE OF LOOSE MATERIALS OR TOOTH GROOVES FOR THE ENTIRE WIDTH OF THE TRENCH PRIOR TO PLACING THE GRANULAR BEDDING MATERIAL.
5. CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS TO ABANDON EXISTING SEWER AND WATER SERVICES NOT SCHEDULED TO REMAIN IN SERVICE.
6. ALL SITE UTILITIES ABANDONED IN PLACE SHALL HAVE ALL OPENINGS CLOSED WITH CONCRETE PLUGS WITH A MINIMUM LENGTH OF 12-INCHES OR 2 TIMES THE DIAMETER OF THE ABANDONED PIPE, WHICHEVER IS LARGER.
7. MINIMUM ALLOWABLE CLEARANCE BETWEEN PIPES AT CROSSINGS SHALL BE 6-INCHES.
8. THE END OF ALL UTILITY STUBS SHALL BE MARKED WITH A 2X4, EXTENDING 2-FEET MINIMUM ABOVE FINISH GRADE, PAINTED AND WIRED TO PIPE STUB (PAINTED GREEN FOR SANITARY SEWER, WHITE FOR STORM). TYPE OF UTILITY (IE. SEWER, STORM, ETC) AND DEPTH BELOW GRADE TO TOP OF PIPE SHALL BE CLEARLY AND PERMANENTLY LABELED ON THE MARKER POST.
9. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT AND FACILITIES REQUIRED FOR TESTING ALL UTILITY PIPING IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.



10. **TRACER WIRE.** ALL NON-METALLIC WATER, SANITARY AND STORM SEWER PIPING SHALL HAVE AN ELECTRICALLY CONDUCTIVE INSULATED 12 GAUGE COPPER TRACER WIRE THE FULL LENGTH OF THE INSTALLED PIPE USING BLUE WIRE FOR WATER AND GREEN FOR STORM AND SANITARY PIPING. TRACER WIRE SHALL BE EXTENDED UP INTO ALL VALVE BOXES, AND MANHOLES AND CATCH BASINS. TRACER WIRE PENETRATIONS INTO MANHOLES SHALL BE WITHIN 18-INCHES OF THE RIM ELEVATION AND ADJACENT TO MANHOLE STEPS. THE TRACER WIRE SHALL BE TIED TO THE TOP MANHOLE STEP OR OTHERWISE SUPPORTED TO ALLOW RETRIEVAL FROM THE OUTSIDE OF THE MANHOLE.
11. **WARNING TAPE.** UNDERGROUND DETECTABLE (FOR NON-METALIC PIPING) OR NON-DETECTABLE (FOR METALIC PIPING) ACID AND ALKALI RESISTANT SAFETY WARNING TAPE SHALL BE PROVIDED 12-INCHES MIN TO 18-INCHES MAX FROM FINISH GRADE ALONG THE FULL LENGTH OF ALL UTILITY SERVICE LATERALS AND ALONG ALL UTILITY MAINLINES. UNDERGROUND WARNING TAPE SHALL BE CONTINUOUS THE ENTIRE LENGTH OF SERVICE LATERALS INSTALLED FROM THE MAINLINE TO THE BACK OF THE PUE. MARKING TAPE COLOR SHALL BE IN ACCORDANCE WITH APWA UNIFORM COLOR CODE.
12. NO TRENCHES IN ROADS OR DRIVEWAYS SHALL BE LEFT IN AN OPEN CONDITION OVERNIGHT. ALL SUCH TRENCHES SHALL BE BACKFILLED OR STEEL PLATED AS APPROVED BY THE CITY ENGINEER, BEFORE THE END OF EACH WORK DAY AND NORMAL TRAFFIC FLOWS RESTORED.

7. **WATER**

1. OPERATION OF EXISTING VALVES, INCLUDING FIRE HYDRANTS, SHALL BE PERFORMED ONLY BY AUTHORIZED CITY STAFF. CONTRACTOR SHALL COORDINATE WITH THE CITY ACCORDINGLY.
2. ALL WATER MAINS SHALL BE MINIMUM CLASS 52 DUCTILE IRON. ALL FITTINGS 4-INCHES THROUGH 24-INCHES IN DIAMETER SHALL BE DUCTILE IRON FITTINGS IN CONFORMANCE WITH AWWA C-153 OR AWWA C-110. THE MINIMUM WORKING PRESSURE FOR ALL MJ CAST IRON OR DUCTILE IRON FITTINGS 4-INCHES THROUGH 24-INCH IN DIAMETER SHALL BE 350 PSI FOR MJ FITTINGS AND 250 PSI FOR FLANGED FITTINGS.
3. ALL WATER MAINS TO BE INSTALLED WITH A MINIMUM 36-INCH COVER TO FINISH GRADE UNLESS OTHERWISE NOTED OR DIRECTED. SERVICE LINES TO BE INSTALLED WITH A MINIMUM 30-INCHES COVER WITHIN THE RIGHT-OF-WAY. DEEPER DEPTHS MAY BE REQUIRED AS SHOWN ON THE PLANS OR TO AVOID OBSTRUCTIONS.
4. THRUST RESTRAINT SHALL BE PROVIDED ON ALL BENDS, TEES AND OTHER DIRECTION CHANGES PER THE STANDAD DRAWINGS UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE PLANS. ALL VALVES SHALL BE FLANGE CONNECTED TO ADJACENT TEES OR CROSSES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
5. WATER SERVICE PIPE ON THE PUBLIC SIDE OF THE METER SHALL BE TYPE K SOFT COPPER TUBING CONFORMING TO ASTM B-88. WATER SERVICE PIPE ON THE PRIVATE SIDE OF THE METER SHALL BE AS SPECIFIED PER THE OREGON PLUMBING SPECIALTY CODE.



6. FIRE HYDRANT ASSEMBLIES SHALL BE KENNEDY K-81D GUARDIAN, WATEROUS 5-1/4 PACER, OR APPROVED EQUAL. FIRE HYDRANTS SHALL BE LOCATED TO ALLOW A MINIMUM OF 5-FEET CLEAR SPACE SURROUNDING ALL PORTIONS OF THE HYDRANT. THERE SHALL BE NO OBSTRUCTIONS DIRECTLY IN LINE WITH ANY OF THE PORTS OF THE HYDRANT FOR A DISTANCE OF 6-FEET.
7. DOMESTIC AND FIRE BACKFLOW PREVENTION DEVICES AND VAULTS SHALL CONFORM TO REQUIREMENTS OF PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION.
8. ALL NEW WATER LINES SHALL BE THOROUGHLY FLUSHED, PRESSURE TESTED, CHLORINATED AND BACTERIOLOGICALLY TESTED. POTABLE WATER TEST SHALL BE APPROVED BY THE CITY PRIOR TO ANY METERED SERVICE HOOKUP. CONTRACTOR SHALL INSTALL TEMPORARY PLUG AND BLOWOFF AS REQUIRED AT THE END OF WATERLINE FOR FLUSHING, TESTING AND CHLORINATION.
9. THE WORK SHALL BE PERFORMED IN A MANNER DESIGNATED TO MAINTAIN WATER SERVICE TO BUILDINGS SUPPLIED FROM THE EXISTING WATERLINES. IN NO CASE SHALL SERVICE TO ANY MAIN LINE OR BUILDING BE INTERRUPTED FORM MORE THAN FOUR (4) HOURS IN ANYONE DAY. CONTRACTOR SHALL NOTIFY THE CITY AND ALL AFFECTED RESIDENTS AND BUSINESSES A MINIMUM OF FORTY-EIGHT (48) BUSINESS HOURS (2 WORKING DAYS) PRIOR TO ANY INTERRUPTION OF SERVICE.
10. **SANITARY SEWER AND WATERLINE CROSSINGS.** WHERE SANITARY SEWER LINES CROSS ABOVE OR WITHIN 18-INCHES VERTICAL SEPARATION BELOW A WATERLINE, SEWER MAINS AND/OR LATERALS SHALL BE REPLACED WITH AWWA C-900 PVC PIPE (DR 18) AT THE CROSSING. CENTER ONE FULL LENGTH (20-FOOT) OF AWWA C-900 PVC PIPE AT POINT OF CROSSING. CONNECT TO EXISTING SEWER LINES WITH APPROVED RUBBER COUPLINGS. SANITARY SEWER CROSSINGS SHALL COMPLY WITH DHS REGULATIONS.

8. **SANITARY SEWER**

1. UNLESS OTHERWISE SHOWN, SANITARY SEWER PIPE SHALL BE ASTM D-3034 PVC, MINIMUM SDR 35.
2. ALL PRECAST MANHOLES SHALL BE PROVIDED WITH INTEGRAL RUBBER BOOT MANHOLE PIPE ADAPTER. WHERE MANHOLES WITH INTEGRAL MANHOLE PIPE ADAPTERS ARE NOT USED, A SHEAR JOINT SHALL BE PROVIDED ON ALL MAINLINES WITHIN 1.5-FEET OF THE OUTSIDE FACE OF THE MANHOLE. TAMPER-PROOF MANHOLE COVERS ARE REQUIRED ON ALL MANHOLES OUTSIDE OF PUBLIC RIGHT-OF-WAY.
3. OPENINGS FOR CONNECTIONS TO EXISTING MANHOLES SHALL BE MADE BY CORE-DRILLING THE EXISTING MANHOLE STRUCTURE AND INSTALLING A MANHOLE PIPE ADAPTER. CONNECTIONS TO BE WATERTIGHT AND SHALL PROVIDE A SMOOTH FLOW INTO AND THROUGH THE MANHOLE. SMALL CHIPPING HAMMERS OR SIMILAR LIGHT TOOLS WHICH WILL NOT DAMAGE OR CRACK THE MANHOLE BASE MAY BE USED TO SHAPE CHANNELS. USE OF LARGE PNEUMATIC JACKHAMMERS SHALL BE PROHIBITED. UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY ENGINEER, MANHOLE STEPS SHALL BE INSTALLED IN ANY MANHOLE TAPPED WHICH DOES NOT HAVE EXISTING STEPS.



4. **LEAKAGE TESTING.** SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE. LEAKAGE TESTS SHALL INCLUDE AN AIR TEST OF ALL SEWER MAINS AND LATERALS PRIOR TO PAVING, AND A SEPARATE AIR TEST OF ALL SEWER MAINS AND LATERALS FOLLOWING EXCAVATION AND BACKFILLING OF ANY FRANCHISE UTILITY TRENCHES OR OTHER UTILITY WORK THAT CROSSES SANITARY SEWER LATERALS. ALL MANHOLES SHALL BE VACUUM TESTED FOLLOWING COMPLETION OF PAVING OR FINAL SURFACE RESTORATION. ALL TESTING SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
5. **CLEANING.** PRIOR TO MANDREL TESTING AND/OR CCTV INSPECTION, FLUSH AND CLEAN ALL SEWERS, AND REMOVE ALL FOREIGN MATERIAL FROM THE MAINLINES AND MANHOLES. FAILURE TO CLEAN ALL DIRT, ROCK AND DEBRIS FROM PIPELINES PRIOR TO TV INSPECTION WILL RESULT IN THE NEED TO RE-CLEAN AND RE- CCTV THE SEWER LINES.
6. **MANDREL TESTING.** CONTRACTOR SHALL CONDUCT DEFLECTION TEST OF FLEXIBLE SANITARY SEWER PIPES BY PULLING AN APPROVED MANDREL THROUGH THE COMPLETED PIPE LINE FOLLOWING TRENCH COMPACTION. THE DIAMETER OF THE MANDREL SHALL BE 95 PERCENT OF THE INITIAL PIPE DIAMETER. TEST SHALL BE CONDUCTED NOT MORE THAN 30 DAYS AFTER THE TRENCH BACKFILLING AND COMPACTION HAS BEEN COMPLETED.
7. **CCTV INSPECTION.** UPON COMPLETION OF ALL SEWER CONSTRUCTION, TESTING AND REPAIR, THE CONTRACTOR SHALL CONDUCT A COLOR CLOSED-CIRCUIT TELEVISION (CCTV) ACCEPTANCE INSPECTION OF ALL MAINLINES IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS TO DETERMINE COMPLIANCE WITH GRADE REQUIREMENTS. THE CCTV INSPECTION SHALL BE CONDUCTED BY AN APPROVED TECHNICAL SERVICE WHICH IS EQUIPPED TO MAKE AUDIO-VISUAL RECORDINGS OF THE CCTV INSPECTIONS ON DVD (VHS VIDEO TAPE ACCEPTABLE ONLY UPON PRIOR WRITTEN APPROVAL BY CITY ENGINEER). UNLESS OTHERWISE REQUIRED BY THE AGENCY WITH JURISDICTION, A STANDARD 1-INCH DIAMETER BALL SHALL BE SUSPENDED IN FRONT OF THE CAMERA DURING THE INSPECTION TO DETERMINE THE DEPTH OF ANY STANDING WATER. SUFFICIENT WATER TO REVEAL LOW AREAS OR REVERSE GRADES SHALL BE DISCHARGED INTO THE PIPE IMMEDIATELY PRIOR TO INITIATION OF THE CCTV INSPECTION. THE DVD AND WRITTEN REPORT SHALL BE DELIVERED TO THE CITY ENGINEER.
8. ALL SANITARY SERVICE LATERAL CONNECTIONS AT THE MAIN ARE TO BE TEES, UNLESS OTHERWISE NOTED.
9. ALL SEWER SERVICE LATERALS SHALL EXTEND A MINIMUM OF 5-FEET BEYOND PUE INTO EACH LOT. THE MINIMUM GRADE FOR LATERALS SHALL BE 2 PERCENT EXCEPT WHERE APPROVED BY CITY. SANITARY SEWER SERVICE LATERALS SHALL BE 4-INCH DIAMETER UNLESS OTHERWISE NOTED ON THE PLANS.

9. STORM DRAIN

1. CONTRACTOR SHALL USE UNIFORM PIPE MATERIAL ON EACH PIPE RUN BETWEEN STRUCTURES UNLESS OTHERWISE DIRECTED OR APPROVED. JOINTED HDPE PIPE SHALL NOT BE USED FOR SLOPES EXCEEDING 12 PERCENT.
2. CATCH BASINS AND JUNCTION BOXES SHALL BE SET SQUARE WITH BUILDINGS OR WITH THE EDGE OF THE CURB, PARKING LOT, AND STREET WHEREIN THEY LIE. STORM DRAIN INLET STRUCTURES AND PAVING SHALL BE ADJUSTED SO WATER FLOWS INTO THE STRUCTURE WITHOUT PONDING WATER.



3. UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER, ALL STORM DRAIN CONNECTIONS SHALL BE BY MANUFACTURED TEES OR SADDLES.
4. STORM DRAINS SHALL BE LAID ON A STRAIGHT ALIGNMENT WITH UNIFORM GRADE BETWEEN STRUCTURES AND LAID UPGRADE WITH SPIGOT ENDS POINTING IN DIRECTION OF FLOW. ALL STORM PIPE JOINTS SHALL BE WATERTIGHT REGARDLESS OF SPECIFIED OR SELECTED MATERIAL.
5. UNLESS OTHERWISE SPECIFIED OR DIRECTED, INSTALL STORM DRAIN PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION GUIDELINES.
6. **CLEANING.** PRIOR TO MANDREL TESTING OR FINAL ACCEPTANCE, FLUSH AND CLEAN ALL STORM DRAINS, AND REMOVE ALL FOREIGN MATERIAL FROM THE MAINLINES, MANHOLES AND CATCH BASINS.
7. **MANDREL TESTING.** CONTRACTOR SHALL CONDUCT DEFLECTION TEST OF FLEXIBLE STORM SEWER PIPES BY PULLING AN APPROVED MANDREL THROUGH THE COMPLETED PIPE LINE FOLLOWING TRENCH COMPACTION. THE DIAMETER OF THE MANDREL SHALL BE 95 PERCENT OF THE INITIAL PIPE DIAMETER. TEST SHALL BE CONDUCTED NOT LESS THAN 30 DAYS AFTER THE TRENCH BACKFILLING AND COMPACTION HAS BEEN COMPLETED.

10. STREET LIGHTS

1. STREET LIGHTS SHALL BE INSTALLED AFTER ALL OTHER EARTHWORK AND PUBLIC UTILITY INSTALLATIONS ARE COMPLETED AND AFTER ROUGH GRADING OF THE PROPERTY IS ACCOMPLISHED TO PREVENT DAMAGE TO THE POLES.
2. STREET LIGHT POLES SHALL BE SET TO A DEPTH AS SPECIFIED BY THE MANUFACTURER, BUT NOT LESS THAN 5-FEET.
3. STREETS LIGHT POLES AND ARMS SHALL CONFORM TO THE STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS. POLES SHALL BE INSTALLED WITHIN ONE (1) DEGREE OF PLUMB.

11. FRANCHISE UTILITIES

1. UNLESS OTHERWISE SHOWN ON THE PLANS AND APPROVED IN WRITING BY ALL JURISDICTIONS HAVING AUTHORITY, NEW AND RELOCATED PRIVATE UTILITIES (POWER, CABLE, TELEPHONE AND GAS) SHALL BE INSTALLED UNDERGROUND IN CONJUNCTION WITH THE DEVELOPMENT.
2. CONTRACTOR SHALL COORDINATE WITH GAS, POWER, TELEPHONE, AND CABLE COMPANY FOR LOCATION OF CONDUITS IN COMMON TRENCHES, AS WELL AS LOCATION OF VAULTS, PEDESTALS, ETC. UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY, ALL ABOVE-GRADE FACILITIES SHALL BE LOCATED IN PUES (WHERE PUES EXIST OR WILL BE GRANTED BY THE DEVELOPMENT), AND OTHERWISE SHALL BE PLACED IN A LOCATION OUTSIDE THE PROPOSED SIDEWALK LOCATION. INSTALLATION OF PRIVATE UTILITIES IN A COMMON TRENCH WITH OR WITHIN 3 FEET HORIZONTALLY OF PARALLELING WATER, SANITARY SEWER OR STORM DRAINS IS PROHIBITED.



3. POWER, TELEPHONE AND CABLE TRENCHING AND CONDUITS SHALL BE INSTALLED PER UTILITY COMPANY REQUIREMENTS WITH PULL WIRE. CONTRACTOR SHALL VERIFY WITH UTILITY COMPANY FOR SIZE, LOCATION AND TYPE OF CONDUIT PRIOR TO CONSTRUCTION, AND SHALL ENSURE THAT TRENCHES ARE ADEQUATELY PREPARED FOR INSTALLATION PER UTILITY COMPANY REQUIREMENTS. ALL CHANGES IN DIRECTION OF UTILITY CONDUIT RUNS SHALL HAVE LONG RADIUS STEEL BENDS.
4. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR RELOCATION OF POWER POLES, VAULTS, ETC. TO AVOID CONFLICT WITH CITY UTILITY STRUCTURES, FIRE HYDRANTS, METERS, SEWER OR STORM LATERALS, ETC.

12. COMPACTION AND DENSITY REQUIREMENTS

1. COMPACTION SHALL BE BY MECHANICAL MEANS FOR ALL TYPES OF MATERIALS. COMPACTIONS EQUIPMENT FOR GRANULAR MATERIALS SHALL BE VIBRATORY PLATE OR VIBRATORY DRUM COMPACTORS AND SHALL BE ADEQUATE TO OBTAIN THE AMOUNT OF COMPACTIONS SHOWN. COMPACTION EQUIPMENT SHALL BE OPEARATED IN STRICT ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS AND RECOMMENDATIONS AND SHALL BE MAINTAINED IN SUCH CONDITION THAT IT WILL DELIVER THE MANUFACTURER’S RATED COMPACTIVE EFFORT.
2. ALL COMPACTION AND IN-PLACE DENSITY AND MOISTURE TESTS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE ODOT/APWA STANDARD CONSTRUCTION SPECIFICATIONS AND AASHTO STANDARD SPECIFICATIONS.

ENGINEERED FILL:

MINIMUM PERCENT COMPACTION REQUIRED	95 PERCENT
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-180
FREQUENCY OF DENSITY TESTING	8-INCH LIFTS, 3 TEST FOR EACH 2- FEET OF FILL PLACED

ROAD SECTION – EMBANKMENT:

MINIMUM PERCENT COMPACTION REQUIRED	95 PERCENT
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-180
FREQUENCY OF DENSITY TESTING OF EMBANKMENT	8-INCH LIFTS, 3 TESTS FOR EACH 2-FEET OF EMBANKMENT PLACED

ROAD SECTION – SUBGRADE:

MINIMUM PERCENT COMPACTION REQUIRED	95 PERCENT
MINIMUM PERCENT COMPACTION REQUIRED TO WHAT DEPTH BELOW SUBGRADE	12-INCHES
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-180
FREQUENCY OF DENSITY TESTING OF SUBGRADE	AS NEEDED

ROAD SECTION – AGGREGATE BASE:

MINIMUM PERCENT COMPACTION REQUIRED	95 PERCENT
TEST METHODS REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-180
FREQUENCY OF DENSITY TESTING OF AGGREGATE BASE	8-INCH LIFTS, 150- FEET INTERVALS OR AS NEEDED



ROAD SECTION – ASPHALT PAVEMENT:

MINIMUM PERCENT COMPACTION REQUIRED	91 PERCENT
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-209
FREQUENCY OF DENSITY TESTING OF ASPHALT PAVEMENT	5 TESTS MINIMUM* AVERAGE DENSITY
FULL TIME INSPECTION OR SPOT CHECKING OF COMPACTION	SPOT, OR AS SHOWN ON PLANS

UTILITY TRENCH: (BENEATH PAVEMENT AND SIDEWALK)

MINIMUM PERCENT COMPACTION REQUIRED FOR BEDDING AND PIPE ZONE	90 PERCENT
MINIMUM PERCENT COMPACTION REQUIRED FOR TRENCH BACKFILL ABOVE THE PIPE ZONE	92 PERCENT BELOW TOP 5-FEET OF TRENCH BACKFILL 95 PERCENT WITHIN TOP 5-FEET OF TRENCH BACKFILL
MINIMUM PERCENT COMPACTION REQUIRED IN UNIMPROVED, NON-ENGINEERED FILL AREAS	90 PERCENT
TEST METHOD REQUIRED TO DETERMINE MAXIMUM DENSITY	AASHTO T-180
FREQUENCY OF DENSITY TESTING OF UTILITY TRENCH BACKFILL	1 test for every 2-foot vertical at intervals of 200 lineal feet of trench or as directed. Perform a minimum of 1 test for trench length less than 200 lineal feet.

ADDITIONAL INFORMATION/COMMENTS:

*WHEN USING NUCLEAR GAUGE, TWO READINGS AT EACH SITE, THE SECOND AT RIGHT ANGLES TO THE FIRST. THE TWO READING WILL BE AVERAGED TO OBTAIN TEST DENSITY.

13. EROSION CONTROL NOTES

A. GENERAL

1. APPROVAL OF THE EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
2. THE IMPLEMENTATION OF THE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.



4. THE ESC FACILITIES SHOWN ON THE PLANS MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
7. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A STORM EVENT.
8. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.

B. SEDIMENT FENCES

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 18 INCHES.
3. THE STANDARD STRENGTH FILTER FABRIC SHALL BE FASTENED SECURELY TO STITCHED LOOPS INSTALLED ON THE UPSLOPE SIDE OF THE POSTS, AND 6-INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 30-INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO THE EXISTING TREES.
4. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
5. SEDIMENT FENCES SHALL BE INSPECTED BY APPLICANT/CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

C. GRAVEL CONSTRUCTION ENTRANCES

1. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.



2. THE AREA OF THE ENTRANCE SHALL BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE ROCK SHALL BE PLACED TO THE SPECIFIED DIMENSIONS, BUT SHALL BE MINIMUM 8 INCHES THICK AND AT LEAST 50 FEET IN LENGTH. WIDTH SHALL BE THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAY.
4. IF THE ROCK PAD DOES NOT ADEQUATELY REMOVE DIRT AND MUD FROM VEHICLE WHEELS SUCH THAT MUD AND DIRT TRACKING IS EVIDENT OFF SITE, ADDITIONAL MEASURES MUST BE TAKEN. SUCH MEASURES MAY INCLUDE HOSING OFF WHEELS BEFORE VEHICLES LEAVE THE SITE OR OTHER CONSTRUCTION TECHNIQUES/WORK OPERATIONS MODIFICATION. WHEEL WASHING SHOULD BE DONE ON THE ROCK PAD AND WASH WATER SHOULD DRAIN THROUGH A SILT-TRAPPING STRUCTURE PRIOR TO LEAVING THE CONSTRUCTION SITE.
5. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT.
6. SUB-GRADE STABILIZATION FABRIC SHALL BE USED UNDER ROCK PADS.
7. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

END OF APPENDIX D

