Advance Packet for October 22, 2012 City Council Meeting
Released 10-15-12

Included in this packet is document to support the following Agenda items:

Public Hearings/Ordinances/Resolutions/Final Orders

1. Brookings Municipal Code updates in conjunction with Engineering Standards and Specifications Update. [Public Works, pg. 2]
   a. Ordinance 12-O-703 [pg. 3]
   b. Ordinance 12-O-704 [pg. 5]
      b.1.Revisions to 8.10.020 and Chapters12.10, 15 and 20 [pg. 9]
2. Brookings Municipal Code update of Title 18, Engineering Standards and Specs for Public Works Infrastructure, in its entirety. [Public Works, pg. 16]
   a. Ordinance 12-O-705 with updated Engineering Standards and Specifications Document [pg. 18]

*Obtain Public Comment Forms and view the agenda and packet information on-line at www.brookings.or.us, or at City Hall. Return completed Public Comment Forms to the City Recorder before the start of meeting or during regular business hours.

All public meetings are held in accessible locations. Auxiliary aids will be provided upon request with advance notification. Please contact 541-469-1102 if you have any questions regarding this notice.

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: October 22, 2012

Originating Dept: PW/DS

Signature (submitted by)

City Manager Approval

Subject: Additions and Updates to the Brookings Municipal Code in Conjunction with Engineering Requirements and Standard Specifications for Public Works Construction

Recommended Motion:

1) Motion to adopt Ordinance 12-O-703 adding Chapter 12.45 to the Brookings Municipal Code
2) Motion to adopt Ordinance 12-O-704 amending Brookings Municipal Code Chapter 8.10 "Watercourses, Drainage Channel Maintenance, Storm Drain Protection," Chapter 12.10 "Sidewalks," and Chapter 12.15 "Excavations."

Financial Impact: None.

Background/Discussion: Updates to the Engineering Requirements and Standard Specifications for Public Works Construction necessitated a closer look at the Brookings Municipal Code (BMC) to ensure consistency. The current BMC was lacking a chapter that clearly explained Public Right of Way permits. A new chapter 12.45 was created to specifically address the permit in which the City authorizes activity in the right of way in compliance with the updated standards and specifications. Similarly, updates to Chapter 8.10, 12.10 and 12.15 were updated to comply with American Disability Act standards and directly correlate to the new public right of way standards.

Attachment(s): a) Ordinance 12-O-703 adding Chapter 12.45
b) Ordinance 12-O-704 amending Chapters 8.10, 12.10, and 12.15
b.1) Modifications to Chapters 8.10, 12.10 and 12.15

IN AND FOR THE CITY OF BROOKINGS
STATE OF OREGON

ORDINANCE 12-O-703

IN THE MATTER OF ORDINANCE 12-O-703, AN ORDINANCE ADDING CHAPTER 12.45, PUBLIC RIGHT OF WAYS, TO BROOKINGS MUNICIPAL CODE TITLE 12, STREETS, SIDEWALKS AND PUBLIC PLACES.

Sections:

The City of Brookings ordains as follows:

Section 1. Ordinance Identified. This ordinance adds Chapter 12.45, Public Right of Ways, to Brookings Municipal Code Title 12, Streets, Sidewalks and Public Places.

Section 2. Adds Chapter 12.45 : Chapter 12.45, Public Right of Ways is added to read as follows:

Chapter 12.45
Public Right of Ways

12.45.010 Purpose
The Public Works Department is responsible for all city public right of ways and public infrastructure. This includes any infrastructure, above and below ground, dedicated for public use.

12.45.20 Definitions
For purposes of this chapter:

A. "Encroachment" refers to a privately owned and maintained structure located in the right of way, such as a mailbox.

B. "Permittee" refers to the owner and/or contractor as named on the Public Works permit.

12.45.030 Permit required

A. Public Works Permit and Inspection. A Public Works permit and inspection is required for any construction, or construction related activity, that takes place within a city public right of way, easement, and/or city maintained facility.

B. Right to Use permit. A Right to Use permit is required for any encroachment in the city public right of way.

12.45.040 Permit procedure and requirements

A. Permit applications shall be submitted to the city Public Works Department. The application shall include a sketch or engineered plan as specified under BMC 18.05.007, and shall comply with all relevant conditions specified in BMC Title 18.

B. Permit applications shall be reviewed for compliance with BMC Title 18. Approved applications shall be issued within 20 days of application. Written notification of an incomplete application shall be issued within 10 days of submittal.

C. Prior to issuance, a permit time limit shall be established. The city shall allow a reasonable time for completion given current circumstances. All work under the permit shall be completed within the set time limit.
D. Permit approval shall be provided by Public Works staff, as authorized by the City Manager.
E. All applicable fees must be paid in full prior to permit approval.

12.45.050 Fees and charges
Fees and charges under this chapter shall be adopted by Brookings Master Fee Resolution as provided under BMC 1.10.

12.45.060 Permit restrictions.
No new permit as defined in this chapter shall be issued to any entity or person whose work has necessitated city action for failure to perform or complete the work as approved.

12.45.080 Claims
Acceptance or approval by the city of any public works improvements shall not prevent the city from asserting a claim against the permittee for any incomplete or defective work found within 12 months of project completion.

12.45.070 Violation and Penalty
The permittee shall be notified in writing of any violation of this chapter. Failure to remedy the violation within the specified time limit provided in the notification, or to obtain a permit for any activity described in this chapter, shall be punishable as provided under BMC 1.05.

First Reading: _____ Passage: _____

Second Reading: _____ Effective Date: _____

Signed by me in authentication of its passage this _____ , day of _____ , 2012

ATTEST:

_____
Mayor Ron Hedenskog

_____
City Recorder Joyce Heffington

IN AND FOR THE CITY OF BROOKINGS
STATE OF OREGON

ORDINANCE 12-O-704

IN THE MATTER OF ORDINANCE 12-O-704, AN ORDINANCE AMENDING BROOKINGS MUNICIPAL CODE SECTION 8.10.020, AND CHAPTERS 12.10, 12.15 AND 12.20 IN THEIR ENTIRETY.

Sections:

The City of Brookings ordains as follows:

Section 1. Ordinance Identified. This ordinance amends Brookings Municipal Code Section 8.10.020, and Chapters 12.10, 12.15 and 12.20 in their entirety.

Section 2. Amends Section 8.10.200 and Chapters 12.10, 12.15 and 12.20 : Section 8.10.020 and Chapters 12.10, 12.15 and 12.20 are amended as follows:

Chapter 8.10
WATERCOURSES, DRAINAGE CHANNEL MAINTENANCE, STORM DRAIN PROTECTION

8.10.020 Permit required.
A public works permit is required per BMC 12.45 for any and all work in a public right of way waterway or drainage course and may be terminated by order of the City for failure by the property owner to properly maintain the improved waterway and drainage appurtenances in a safe and workmanlike manner.

Chapter 12.10
SIDEWALKS

Sections:

12.10.010 Applicability.
This chapter shall apply only to sidewalks located within the public right-of-way. [Ord. 09-O-624 § 2.]

12.10.020 Definitions.
For purposes of this chapter:

A. "Sidewalk" shall mean a walk or footway for pedestrians constructed out of material other than the ground traversed by the walk or footway and located in the public right-of-way.
B. "Nonconforming sidewalk" shall mean any sidewalk constructed that is not in conformance with BMC Title 18. [Ord. 09-O-624 § 2.]

12.10.030 Declaration of the city's jurisdiction over sidewalks.
The city of Brookings claims, maintains, exerts, and reserves jurisdiction over all sidewalks within the public right-of-way of the city of Brookings. Engineering requirements and standards for sidewalk improvements are contained in BMC Title 18. [Ord. 09-O-624 § 2.]

12.10.040 Prohibition against blocking sidewalks.
It shall be prohibited to obstruct or in any way restrict the width of the sidewalk unless specifically approved by the site plan committee. [Ord. 09-O-624 § 2.]

12.10.050 Permit and fee required.
A Public Works Permit and Inspection fee is required as provided under BMC 12.45. Engineered documents will also require a Public Works Plan Review fee. Fees are determined as provided under BMC 1.10.[Ord. 09-O-624 § 2.]

12.10.060 Compliance with Americans with Disability Act Standards

A. Location of all temporary and permanent fixtures, including trash receptacles, mail boxes, light fixtures, fire hydrants and other infrastructure must provide minimum Americans with Disabilities Act (ADA) accessibility clearance as determined by current ADA standards.- Current standards may be obtained from the Public Works Department.
B. A survey may be required prior to sidewalk installation in order to ensure current ADA compliance.

12.10.060 Exemption for installation of sidewalks.
Unless a project meets the exemptions listed in BMC 17.04.050 or is specifically exempted by the site plan committee, a conforming sidewalk must be constructed along the full length of the property abutting the street frontages. [Ord. 09-O-624 § 2.]

12.10.070 Violations and penalty
A violation of any section of this chapter shall be punishable as provided under BMC 1.05. [Ord. 09-O-624 § 2.]

Chapter 12.15
EXCAVATIONS

Sections:

12.15.030 Permittee's responsibilities
12.15.040 Prohibited
12.15.050 Violation and penalty

12.15.010 Generally.
No entity or person shall dig or excavate in or upon any street or alley of the city of Brookings; change, alter, or destroy the surface of any such street or alley; obstruct the reasonable use of such street or alley by the public or the regular flow of vehicular or pedestrian travel over and upon such street or alley; or cause, or attempt to cause, any or all of the same to be done by any other person, firm, or corporation, employee, agent, or representative whomsoever, without first having an approved Public Works Permit. [Ord. 71-O-221 § 1.]

12.15.020 Permit and fee required.
A Public Works Permit and Inspection Fee is required as provided under BMC 12.45. Engineered documents will also require a Public Works Plan Review fee. Fees are determined as provided under BMC 1.10. [Ord. 71-O-221 § 4.]

12.15.030 Permittee's responsibilities.
Permittee is required to follow all the terms and provisions as provided under BMC Title 18. [Ord. 71-O-221 § 8.]

12.15.040 Prohibited.
It shall be unlawful for any person owning, controlling, using, or operating any water main, irrigation, or drainage pipeline or ditch, flume, or other structure to permit any water from such water main, pipeline, ditch, flume, or other structure to flow, waste, or seep into any street or alley of the city of Brookings in such manner as to damage or injure such street or alley, or as to interfere with traffic thereon. [Ord. 71-O-221 § 15.]

12.15.050 Violation and penalty.
A violation of any section of this chapter shall be punishable as provided under BMC 1.05. [Ord. 71-O-221 § 16.]

Chapter 12.20
FIRE HYDRANTS

Sections:
12.20.010 Spacing.
12.20.020 Testing.
12.20.030 Permit and fees
12.20.040 Violations

12.20.010 Spacing.

A. Industrial Areas. One or more fire hydrants shall be placed at each street intersection depending on the needed fire flow with an intermediate fire hydrant being placed so that the fire hydrants are no more than 300 feet apart and so located that all buildings in a complex can be reached by a comparatively short hose line from more than one fire hydrant. The above spacing shall be the same for large individual buildings of industrial, mercantile, nature, or multiple-unit residential structures.

B. For single-family residential areas, there shall be a fire hydrant located at each street intersection with intermediate hydrants spaced so they are no more than 500 feet apart. [Ord. 78-O-303 § 1.]

12.20.020 Testing.

Fire hydrants shall be tested and inspected prior to any framing construction being commenced on structures which may demand a high fire flow. [Ord. 78-O-303 § 2.]

12.20.030 Permit and fees.

A Public Works Permit and Inspection Fee is required as provided under BMC 12.45. Applications including engineered drawings are also subject to a Public Works Plan Review Fee. Fees are determined as provided under BMC 1.10. [Ord. 78-O-303 § 3.]

12.20.040 Violations.

A violation of any section of this chapter shall be punishable as provided under BMC 1.05.

First Reading: _____ Passage: _____

Second Reading: _____ Effective Date: _____

Signed by me in authentication of its passage this _____, day of _____, 2012

ATTEST:

_____

Mayor Ron Hedenskog

_____

City Recorder Joyce Heffington

Revisions to Section 8.10.020, and Chapters 12.10, 12.15 and 12.20
Key: New language ~~stricken~~ language staff comments

Chapter 8.10
WATERCOURSES, DRAINAGE CHANNEL MAINTENANCE, STORM DRAIN PROTECTION

8.10.020 Permit required.
~~The permit required herein may be terminated by order of the city manager for failure by the property owner to properly maintain the improved waterway and drainage appurtenances in a safe and workmanlike manner. [Ord. 11-O-686 § 2; Ord. 07-O-591 § 2; Ord. 88-O-429 § 2.]~~ A public works permit is required per BMC 12.45 for any and all work in a public right of way waterway or drainage course and may be terminated by order of the City for failure by the property owner to properly maintain the improved waterway and drainage appurtenances in a safe and workmanlike manner.

Chapter 12.10
SIDEWALKS

Sections:

12.10.010 Applicability.
This chapter shall apply only to sidewalks located within the public right-of-way. [Ord. 09-O-624 § 2.]

12.10.020 Definitions.
For purposes of this chapter:

A. "Sidewalk" shall mean a walk or footway for pedestrians constructed out of material other than the ground traversed by the walk or footway and located in the public right-of-way.
B. "Nonconforming sidewalk" shall mean any sidewalk constructed that is not in conformance with BMC Title 18. [Ord. 09-O-624 § 2.]

12.10.030 Declaration of the city's jurisdiction over sidewalks.
The city of Brookings claims, maintains, exerts, and reserves jurisdiction over all sidewalks within the public right-of-way of the city of Brookings. Engineering requirements and standards for sidewalk improvements are contained in BMC Title 18. [Ord. 09-O-624 § 2.]

12.10.040 Prohibition against blocking sidewalks.

~~Except for overnight placement of trash cans for weekly garbage removal it~~ It shall be prohibited to obstruct or in any way restrict the width of the sidewalk unless specifically approved by the site plan committee. [Ord. 09-O-624 § 2.]

12.10.050 ~~Procedure to secure p~~ Permit and fee required.

~~A written application shall be made to the city manager or his designee. The application shall be reviewed and if the provisions of this chapter have been met a permit shall be issued within 30 days. If the application is deemed incomplete the applicant shall be notified in writing within 20 days of submittal.~~ A Public Works Permit and Inspection Fee is required as provided under BMC 12.45. Applications including engineered drawings are also subject to a Public Works Plan Review Fee. Fees are determined as provided under BMC 1.10.[Ord. 09-O-624 § 2.] [stricken language is covered under Chapter 12.45]

12.10.060 Compliance with Americans with Disability Act Standards

A. Location of all temporary and permanent fixtures, including trash receptacles, mail boxes, light fixtures, fire hydrants and other infrastructure must provide minimum Americans with Disabilities Act (ADA) accessibility clearance as determined by current ADA standards.- Current standards may be obtained from the Public Works Department.

B. A survey may be required prior to sidewalk installation in order to ensure current ADA compliance.

12.10.07~~60~~ Exemption for installation of sidewalks.

Unless a project meets the exemptions listed in BMC 17.04.050 or is specifically exempted by the site plan committee, a conforming sidewalk must be constructed ~~abutting~~ along the full length of the property abutting the ~~all~~ street frontages. [Ord. 09-O-624 § 2.]

12.10.08~~70~~ Violations and penalty.

A violation of any section of this chapter shall be punishable as provided under BMC 1.05. [Ord. 09-O-624 § 2.]

Chapter 12.15
EXCAVATIONS

Sections:

~~12.15.130 Recovery of costs from permittee due to violations.~~
~~12.15.140 Permit restrictions.~~
12.15.040~~150~~ Prohibited ~~Violations.~~
12.15.050~~160~~ Violation and penalty

12.15.010 Generally ~~excavation permit required.~~

No entity or person ~~person, firm, or corporation, nor any employee, agent, or representative of any such person, firm, or corporation~~ shall dig ~~a hole or holes,~~ or ~~make an~~ excavate ~~ion or excavations~~ in or upon any street or alley of the city of Brookings; change, alter, or destroy the surface of any such street or alley; obstruct the reasonable use of such street or alley by the public or the regular flow of vehicular or pedestrian travel over and upon such street or alley; or cause, or attempt to cause, any or all of the same to be done by any other person, firm, or corporation, employee, agent, or representative whomsoever, without first having an approved Public Works Permit. ~~applied to the city council and having first received from the said city council, or its duly appointed and authorized official, its consent and permission therefor and thereto.~~. [Ord. 71-O-221 § 1.]

~~12.15.020 City superintendent of streets Supervisor designated authorized official.~~

~~The city superintendent of streets Supervisor of the city of Brookings is hereby named and designated as said duly appointed and authorized official, as such official is named and referred to in BMC 12.15.010; and to such effect the said city superintendent of streets is hereby delegated with full power and authority to act for the city council in the matter of such consent and permission. [Ord. 71-O-221 § 2.]~~ [this is now covered under Title 18.]

~~12.15.030 Written application required.~~

~~Any person, firm or corporation, or any other person named or referred to in BMC 12.15.010 shall, before digging a hole, making an excavation, changing, altering, destroying, or obstructing upon, to, or in any street or alley of the city of Brookings, for any cause or purpose whatsoever, shall make written application to the city of Brookings, addressed to the city superintendent of streets superintendent of Brookings, applying in said application for the permission and consent of the city of Brookings so to proceed. Such applicant shall, in its or his said written application, set forth therein the reason or reasons upon which the said application is based, the purpose to be accomplished for which said application is made, and the period of time to be covered in the accomplishment of said purpose. Said application shall be in substantially the form set forth in Exhibit A attached to the ordinance codified in this chapter and hereby made a part hereof as though set out in full and at length herein. [The street superintendent, prior to granting any permit, shall establish the maximum time during which the permit shall be valid. The permittee shall complete all work of cutting, excavating, backfilling, and resurfacing within such maximum time limit. In setting said time limit the street superintendent shall allow a reasonable time for completion under the circumstances then found to exist.~~ [covered in Chapter 12. 45]

12.15.02040 ~~Deposit required with permit application.~~ Permit and fee required.

~~Any person, firm, or corporation making such an application for a street cut shall, at the time and place of filing of such application and before a permit shall be issued, deposit with the city recorder a cash deposit or cashier's check drawn on or against an Oregon banking institution and payable to the city of Brookings, or order, in a sum not less than $250.00 as a guarantee and pledge of said city of Brookings by said applicant against any and all loss, damage, or expense that may thereafter arise or be caused by said applicant, its~~

agents, or employees, in the accomplishment of the purpose or purposes contained in said application as made by said applicant, and to ensure the performance of the terms and conditions of said permit and this chapter. The money so paid hereunder shall be deposited in the treasury of the city of Brookings and shall be held until the city council, or its authorized agent, shall authorize the return of the money, or some part thereof, to the applicant so paying the said money. A Public Works Permit and Inspection Fee is required as provided under BMC 12.45. Applications including engineered drawings are also subject to a Public Works Plan Review Fee. Fees are determined as provided under BMC 1.10. [Ord. 71-O-221 § 4.]

12.15.050 Additional deposits required.

A minimum deposit of $250.00 shall be required with all applications. In addition to the minimum $250.00 deposit the following additional sums will be required to be deposited with the application and before any permit is issued:

Trench Width	Deposit Required per Lineal Foot of Cut Lying Within the Street Right-of-Way
1.5 feet or more, but less than 2.0 feet	$2.00 per foot
2.0 feet or more, but less than 2.5 feet	$2.50 per foot
2.5 feet or more, but less than 3.0 feet	$3.00 per foot
3.0 feet	$3.50 per foot

For all trench widths exceeding 3.0 feet in width and exceeding 300 feet in length: before the street cut permit can be issued, it shall be first approved by the mayor and city council in session. The above may be waived in case of emergency which endangers the public health, safety, or sanitation. [Ord. 71-O-221 § 5.]

12.15.060 Compaction requirements.

All portions of the cut which lie within the curb lines of the street or other actual traveled portion of the street as designated by the street superintendent shall be backfilled with wetted sand and shall be tamped to achieve uniform compaction. On streets having asphaltic paved and/or impregnated surfaces, a minimum of four inches or compacted hot mix asphaltic concrete shall be placed in the upper portions of the pavement cut and be rolled and/or tamped to the grade of the surrounding pavement. The same standards shall be applied to sidewalks; except when the sidewalk is composed of poured concrete, the sidewalk, where cut, shall be replaced with concrete.

On graveled and unsurfaced streets, and on the shoulders of paved streets, the permittee shall place a minimum of six inches or compacted crushed rock having a graduation of 3/4 minus, which shall be rolled and/or tamped to the grade of the surrounding pavement. The same standards shall be applied to sidewalks; except when the sidewalk is composed of poured concrete, the sidewalk, where cut, shall be replaced with concrete. [Ord. 71-O-221 § 6.]

12.15.070 Requirements prior to deposit being returned to permittee.

All deposits made by applicants shall be retained by the city until the street superintendent gives approval of the replacement. The street superintendent shall, within 45 days of the completion date stated on the permit, and any extension thereof if an extension be granted, either approve or reject the replacement made by the

~~permittee. If the replacement is approved, the money on deposit shall be returned to the permittee. No deposit shall be returned until the street superintendent shall have given written approval of the replacement. If the replacement is rejected, the permittee shall be informed in writing of such rejection and must, within 30 days of such notification, correct the replacement to the standards of this chapter as applied by the street superintendent. If the permittee fails to make the necessary corrections, his deposit will be retained by the city and the city of Brookings will proceed to make the necessary correction. [Ord. 71-O-221 § 7.]~~

12.15.03080 Permittee's responsibilities.

~~The permittee shall inform himself as to the existence and location of all underground utilities and protect the same against damage. The permittee shall be responsible for any damage done to an public or private property by reason of the breaking of any water pipes, sewers, gas pipes, electric conduits, or other utility facilities~~. Permittee is required to follow all the terms and provisions as provided under BMC Title 18. [Ord. 71-O-221 § 8.]

~~**12.15.090 Requirements for traffic conditions.**~~

~~The permittee shall take appropriate measures to assure that, during the performance of the excavation work, traffic conditions as near normal as practicable shall be maintained at all times so as to cause as little inconvenience as possible to the occupants of the abutting property and to the general public. [Ord. 71-O-221 § 9.]~~

~~**12.15.100 Expedition of excavation work.**~~

~~After an excavation is commenced, the permittee shall prosecute with diligence and expedition all excavation work covered by the excavation permit and shall promptly complete such work and restore the street to its original condition, or as near as may be so as not to obstruct the street or travel thereon more than is reasonably necessary. [Ord. 71-O-221 § 10.]~~

~~**12.15.110 Permittee responsible for condition of fill and replacement for nine months.**~~

~~For a period of nine months following the completion of the work and the restoration of a street, the person who opened the street shall be responsible for the condition of the fill and replacement, and of the resurfacing. All necessary steps shall be taken to ensure that the street remains in good condition, without settlement, at the location of said work. Should the trench settle during this period, it is the responsibility of the permittee to bring the street back to proper grade. [Ord. 71-O-221 § 11.]~~

~~**12.15.120 Claims against permittee.**~~

~~Acceptance or approval by the city of any excavation work and the replacement thereof and resurfacing, if any, shall not prevent the city from asserting a claim against the permittee for incomplete or defective work, if discovered within 12 months from the completion of the work. [Ord. 71-O-221 § 12.]~~ [now covered under BMC 12.45]

~~**12.15.130 Recovery of costs from permittee due to violations.**~~

~~Should the person who opens a street under the authority granted by this chapter fail to reconstruct the street in the manner required hereunder, the city shall notify the permittee of the violation; and if said violation has not been corrected within 10 days of the notification, the city may take steps deemed reasonably necessary to place the street in proper condition and may take all legal means of recovering the cost thereof from the permittee. [Ord. 71-O-221 § 13.]~~ [covered under Chapter 12.45]

~~12.15.140 Permit restrictions.~~

~~No new excavation permits will be issued to any person whose work has necessitated city action under the provisions of BMC 12.15.130.~~ [Ord. 71-O-221 § 14.] [covered under Chapter 12.45]

12.15.~~150~~40 ~~Violations~~ Prohibited

It shall be unlawful for any person owning, controlling, using, or operating any water main, irrigation, or drainage pipeline or ditch, flume, or other structure to permit any water from such water main, pipeline, ditch, flume, or other structure to flow, waste, or seep into any street or alley of the city of Brookings in such manner as to damage or injure such street or alley, or as to interfere with traffic thereon. [Ord. 71-O-221 § 15.]

12.15.~~160~~50 Violation and penalty

~~Any person violating the provisions of this chapter, upon conviction thereof, shall be punished by a fine of not less than $5.00 nor more than $500.00, or by imprisonment in the city jail for a period of not to exceed six months, or by both.~~ A violation of any section of this chapter shall be punishable as provided under BMC 1.05. [Ord. 71-O-221 § 16.]

Chapter 12.20
FIRE HYDRANTS

Sections:

12.20.010 Spacing.

A. Industrial Areas. One or more fire hydrants shall be placed at each street intersection depending on the needed fire flow with an intermediate fire hydrant being placed so that the fire hydrants are no more than 300 feet apart and so located that all buildings in a complex can be reached by a comparatively short hose line from more than one fire hydrant. The above spacing shall be the same for large individual buildings of industrial, mercantile, nature, or multiple-unit residential structures.

B. For single-family residential areas, there shall be a fire hydrant located at each street intersection with intermediate hydrants spaced so they are no more than 500 feet apart. [Ord. 78-O-303 § 1.]

12.20.020 Testing.

Fire hydrants shall be tested and inspected prior to any framing construction being commenced on structures which may demand a high fire flow. [Ord. 78-O-303 § 2.]

12.20.030 ~~Inspection~~ Permit and fees

~~Upon the contractor's completion of all work and prior to acceptance of the fire hydrants by the city, an inspection will be required.~~ A Public Works Permit and Inspection Fee is required as provided under BMC 12.45. Applications including engineered drawings are also subject to a Public Works Plan Review Fee. Fees are determined as provided under BMC 1.10. [Ord. 78-O-303 § 3.]

12.20.040 Violations.

A violation of any section of this chapter shall be punishable as provided under BMC 1.05.

Chapter 8.10
WATERCOURSES, DRAINAGE CHANNEL MAINTENANCE, STORM DRAIN PROTECTION

Section 8.10.020 Permit required.

~~The permit required herein may be terminated by order of the city manager for failure by the property owner to properly maintain the improved waterway and drainage appurtenances in a safe and workmanlike manner. [Ord. 11-O-686 § 2; Ord. 07-O-591 § 2; Ord. 88-O-429 § 2.]~~ A public works permit is required per BMC 12.45 for any and all work in a public right of way waterway or drainage course and may be terminated by order of the City for failure by the property owner to properly maintain the improved waterway and drainage appurtenances in a safe and workmanlike manner.

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: October 22, 2012

Originating Dept: PW/DS

Signature (submitted by)

City Manager Approval

Subject: Engineering Requirements and Standard Specifications for Public Works

Recommended Motion: Motion to adopt Ordinance 12-O-705 adopting the updated Engineering Requirements and Standard Specifications for Public Works

Financial Impact: No financial impact to the City.

Background/Discussion: This document defines the parameters for workmanship and construction materials that will become City maintained infrastructure. The document is a recipe for construction of streets, sidewalks, underground utilities including sewer, storm and water facilities, mail box and street light installation, sub grade work. Current, concise and reasonable standards is a key to ensure that construction is safe, complies with applicable laws, and conducted properly to avoid diminished returns on the investment. There has been a concerted effort over the past few years to update the existing standards and specifications previously adopted March 2006. A committee was formed including Mayor Hedenskog, Councilor Jake Pieper, and City staff and the entire document was basically revamped.

The focus of the committee's attention to this document included;

a) Assurance of quality materials and workmanship.
b) Provide clear and concise information for Contractors.
c) Evaluate the cost and benefits of the requirements to guarantee that we as a City are being reasonable and fair in our expectations of Contractors.
d) Create a handbook for all future inspections.
e) Comply with current regulatory agency standards.

These standards were reviewed and approved by both Department of Environmental Quality (DEQ) and Department of Human Services, and addresses any comments from the public during the review period. All public right of way permits issued after adoption of this document must comply with these standards.

Highlights of the updates include;

- Warrantee bonds will not be required unless the value of the project exceeds $5,000.
- Reduction of trench and roadway sub grade from 10" fill material to 6" fill material.
- Sewer main TV inspections will only apply to larger projects.
- DEQ review exemption for gravity sewer mains

DEQ has approved a gravity sewer review exemption based on these standards under the Public Works/Development Services Directors registered civil engineering license. With the exemption, both City and developer sewer main projects will no longer have to be submitted to the State for approval which will reduce plan review process time and eliminate plan review fees from the State.

Attachment(s): Engineering Requirements and Standard Specifications for Public Works

IN AND FOR THE CITY OF BROOKINGS
STATE OF OREGON

ORDINANCE 12-O-705

IN THE MATTER OF ORDINANCE 12-O-705, AN ORDINANCE AMENDING BROOKINGS MUNICIPAL CODE TITLE 18, ENGINEERING REQUIREMENTS AND STANDARD SPECIFICATIONS, IN ITS ENTIRETY.

Sections:

The City of Brookings ordains as follows:

Section 1. Ordinance Identified. This ordinance amends Brookings Municipal Code Title 18, Engineering Requirements and Standard Specification, in its entirety.

Section 2. Amends Title 18: Title 18 is amended to read as per the attached document titled, "Engineering Requirements and Standard Specifications for Public Works Infrastructure", and dated "October, 2012."

First Reading: _____ Passage: _____

Second Reading: _____ Effective Date: _____

Signed by me in authentication of its passage this _____, day of _____, 2012

ATTEST:

_____
Mayor Ron Hedenskog

_____
City Recorder Joyce Heffington

ENGINEERING REQUIREMENTS and STANDARD SPECIFICATIONS for PUBLIC WORKS INFRASTRUCTURE

CITY OF BROOKINGS,
CURRY COUNTY, OREGON

October, 2012

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General Information and Requirements for Submitting Plans

18.05.001 SCOPE

The purpose of this document is to establish correct procedures, outline acceptable standards of workmanship and required specifications for any work or projects being accomplished within City of Brookings jurisdictional rights of way that involves additions to, amendments, or repairs to City infrastructures, or infrastructure that is being constructed with intention to be dedicated to the City and accepted into the inventory of City infrastructure.

The standard specifications also include construction details as an attachment to this document. The specifications and details complement each other and both must be reviewed and adhered to. Generally, the specifications will include more information on parts and ordering information while the details depict graphics on how to construct the improvements.

18.05.002 DEFINITIONS

A. Engineer: A person holding a current Registered Civil Engineering license in the State of Oregon.

B. City: As used herein the term "City" or "City Engineer" shall denote the City Engineer, the City Manager, or his/her designated representative.

C. Contractor: A private person or organization that has entered into a contractual obligation to perform improvements, repairs or maintenance to public facilities or construct facilities proposed to become public facilities.

D. Original developer: A person, partnership, firm, corporation, or other legal entity in whose name the land development to which BMC 17.168.020, 17,168.050, 17.168.060, 17.168.080, and 17.168.100 is applicable, or the legal heirs, assigns or successors of said developer.

E. On-site improvements are defined as improvements made on private properties. Off-site improvements are defined as construction, repair, maintenance, enlargement, and extension to City infrastructure that exists in dedicated rights of way or easements.

F. Standards and Specifications Committee: Council appointed committee responsible for updates to the Engineering Requirements and Standard Specifications for Public Works Construction.

G. Engineering Requirements and Standard Specifications for Public Works Construction: Also will be known as Construction Standards, Public Works Standards and Details, Public Works Infrastructure Standards, or Brookings Specifications.

18.05.003 ABBREVIATIONS AND ACRONYMS

Whenever the following abbreviations are used in these specifications or on the plans, they are to be construed the same as follows:

AASHTO	American Association of State Highway and Transportation Officials
AC	Asbestos cement pipe
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWS	American Welding Society
AWWA	American Water Works Association
BMC	Brookings Municipal Code
BMP	Best Management Practice
CCB	Construction Contractors Board
CI	Cast iron pipe
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DEQ	Department of Environmental Quality
DET	Detail
DI	Ductile iron pipe
DOH	Department of Health
EPA	Environmental Protection Agency
FT	Feet
FTG	Fitting
FLG	Flange
HMAC	Hot mix asphaltic concrete
IBC	International Building Code
ID	Inner diameter
IEEE	Institute of Electrical and Electronics Engineers
MIN	Minimum
MJ	Mechanical joint
MUTCD	Manual of Uniform Traffic Control Devices
NBFU	National Bureau of Fire Underwriter's
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NTS	Not to scale
OAR	Oregon Administrative Rules
OD	Outer diameter
ODOT	Oregon Department of Transportation
OHD	Oregon Health Division, Drinking Water Section
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Act (both Federal and State Agencies)
OUCC	Oregon Utilities Coordinating Council
PCC	Portland cement concrete

PUE	Public Utility Easement
SS	Stainless steel
TYP	Typical
UPC	Uniform Plumbing Code

18.05.004 GENERAL

A. These specifications establish a minimum standard for development projects under City of Brookings jurisdiction. Designs must follow a standard of engineering excellence for clarity and readability. All work must comply with the approved plans. The City of Brookings does not assume responsibility or liability for a developer's alternate methods, recommendations, or engineering designs that deviate from this document.

B. If unusual conditions arise during construction that warrants changes, the City may require a deviation from the typical sections and details of this document.

C. All work should proceed in a systematic manner, with a minimum of inconvenience to the public or impact to City rights of way.

D. Any work, repair, maintenance, additions, or alteration being performed to City infrastructure must be performed under the supervision of a licensed contractor and if it is being performed in a right of way a right of way permit is required per BMC Title 11.

E. Additions or extensions to City infrastructure that are not included in the final approval of a subdivision plat will require a formal dedication to the City.

F. Disturbed or obliterated property corner monuments or survey reference monuments must be restored per ORS 209.150 and 209.155.

G. All construction within Oregon State Highway Rights-of-Way shall be in conjunction with the "General Provisions of the Oregon Department of Transportation."

H. All construction within the Curry County Rights-of-Way shall be in conjunction with the "Curry County Road Department Specifications".

18.05.005 RESPONSIBILITIES

A. The contractor: is responsible to provide all labor, materials and equipment that are necessary to complete the work as specified in the approved plans. If the contractor has questions about City requirements, they are urged to discuss any issues with City staff prior to commencement of work. Work shall not commence until permits have been issued. Work shall not commence until the City has been notified at least 48 hours in advance and a written "Notice to Proceed" or signed permit is issued by the City of Brookings. If work has been discontinued for the time period specified herein, it shall not resume until the City has been notified in writing. All work shall proceed according to the approved plans and latest City standards, which include, but are not limited to, Zoning Ordinances, Subdivision Ordinance, and this document. Any work not meeting these standards is subject to removal and replacement by the City at the contractor's expense. Other considerations are:

1. Traffic safety, worker safety and safety devices are the responsibility of the contractor, and failure to comply with safety as outlined in this document may result in a cease work order, fine or both.

2. The contractor is responsible for the repair of damaged underground or above ground facilities and the quick restoration of services. The City is not liable for damages the contractor may have caused to private property.

3. Work shall not proceed beyond required inspections. The project shall be inspected under the direction of the City and constructed to the satisfaction of the City.

4. The contractor is responsible to notify Oregon Utilities Coordinating Council (OUCC) and to proceed with underground projects with the appropriate care necessary to avoid damage to underground facilities. The contractor shall pothole and verify the location of marked underground City utilities, their pipe sizes, valves, and etc., and meet all requirements of the OUCC document.

5. Right of way permits are required for projects that take place in City rights of way. The permit remains current for 6 months provided a scheduled inspection occurs every 6 months. A one-time extension of 6 months is permitted providing the applicant submits a request in writing before the current permit expires.

6. One-year warranty bond equal to 10 percent of the value for the total public improvements that exceeded $5,000, for a period of one year, as required per BMC 17.80.090.

7. Developments that must install public utilities such as communication and electric facilities in the right of way or PUE must coordinate the installation of those facilities, such as conduits, junction boxes and poles with the appropriate utility company.

8. Contractor is responsible for all clean up of construction debris and excess excavation materials. All existing ditches, culverts, signposts, and similar items are to be left as found, or as specified by a contract or on the approved plans.

9. The temporary shut-down of water services and water mains requires prior notification. The contractor shall notify the City and all affected residents and businesses a minimum of 48 hours prior to the start of a service curtailment. The shut-down will be completed by City personnel only.

10. Contractor is required to keep his Oregon Construction Contractors Board (CCB) license current and a Brookings City business license is required per BMC 5.05.060.

11. The contractor is required to keep a set of approved plans, attached specifications, and permit available to the job site while work is being performed.

B. The City: will thoroughly review construction plans to assure that all correct materials, their locations, installation procedures and workmanship specifics, that are required, are shown on the plans or included as attachments. City will make

available any special requirements pertinent to the project in attachments. When the plans have been deemed correct, work permits will be issued, in writing. City will furnish the contractor with contact information to several City personnel who are familiar with the project, and who will be available during normal City work hours. In addition, City has available a 24 hour emergency contact number for use in the event of an emergency. Also:

1. Although advanced notice for inspections have a 24 hour maximum time limit, City personnel will make every effort to perform inspections as soon as possible.

2. City will provide a right of way permit and list of the required inspections pertinent to the project.

3. City is responsible for locating underground City infrastructure within the tolerances described in OUCC documents. City will provide surface marks indicating the location of undergrounded City infrastructure and the contractor shall perform pot-hole verifications. In the event City is not able to locate existing underground utilities from as-built plans or by other technical surface means, City will perform pothole investigation, mark, and provide actual location information to the contractor. The contractor may, at his discretion, expense, and risk, perform actual locate investigation.

4. Upon successful completion of a final inspection the City will authorize new installations to be connected to City systems.

18.05.006 SUBSTITUTIONS

A. Alternate Materials, Equipment and Methods: Requests to substitute products specified by manufacturer or manufacturer's model number, use of alternate equipment or installation procedures as specified throughout this document shall be in writing and be accompanied with sufficient information to allow the City to identify the nature and scope of the request. Types of information to be provided shall include:

1. All submittal information required for the specified equipment, including all deviations from the specified requirements necessitated by the proposed substitution.

2. Materials of construction, including material specifications and references.

3. Performance data including performance curves and guaranteed power consumption, over the range of specified operating conditions.

4. Dimensional drawings, showing required access and clearances, including any changes to the work required to accommodate the proposed substitution.

5. Piping, process and instrumentation drawings, along with control descriptions where applicable.

6. Information and performance characteristics for all system components and ancillary devices to be furnished as a part of the proposed substitution.

7. If the substitution requires any mechanical, electrical, or structural changes, the contractor will be responsible for the costs of evaluating a requested

substitution. The City will provide an estimate of costs associated with determining the evaluation of alternatives. The cost for such an evaluation will be determined on a case-by-case basis, after receipt of written request. The City will notify the contractor in writing of said cost. If the contractor wishes to proceed, he shall advise the City in writing and submit additional information as may be requested. The decision to allow a substitution must be made by the City.

18.05.007 GENERAL ENGINEERING REQUIREMENTS

A. Public improvement plans are required to be stamped by an Engineer licensed to perform Civil Engineering in the State of Oregon, and peer reviewed by the City Engineer in the following circumstances:

1. Developments that involve infrastructure and street additions or improvements in conjunction with the subdivision of land.

2. Construction on sites that are subject to the requirements of Chapter 17.100, "Hazardous Building Sites" of the BMC may require additional geologic, flood plain, drainage, erosion, and other professional assessments.

3. Developments that involve extensions of existing infrastructure.

4. Developments in areas where the existing infrastructure is undersized or incompatible.

B. At the time of the first review of a permit application by the Site Plan Committee, developments that are small or simple in nature, such as those that involve single-family residences may be exempted from these engineering requirements, peer review, or both. The applicant will be notified in writing within 10 working days of submission of plans. If peer approval is necessary, the letter will include a consent form authorizing City to peer review the project. Within 10 working days of receiving the signed authorization form from the applicant, the plans will be peer reviewed, and the applicant will be notified in writing of the final comments on the project. The fees for peer review are "actual cost" and must be paid before a permit shall be issued.

C. All engineered specifications and plans are required to meet or exceed the requirements of this document.

D. Inspection Required. Improvements shall be inspected by the City and if requested, by the engineer of record and constructed to the satisfaction of both parties. The City may require changes in typical sections and details if unusual conditions arising during construction warrant such changes in the public interest. Sewer and water systems shall be approved by the city engineer, or his authorized designee, prior to final hookup.

18.05.08 PLAN SUBMITTAL

A. Three sets of preliminary plans, electronic files, and fees must be provided to the City for plan review and comment. Plans shall be prepared in accordance with requirements of the City. No improvement work shall commence until a minimum of 5 sets of approved final construction plans, stamped and signed by the applicant's engineer, are received and permits are issued. Approved plans shall be valid for 1

year after City's approval date. Failure to execute substantial construction on the development or project within that time shall cause plan approval to expire. The applicant may submit and obtain approval for a one-time extension of one year, in writing, prior to a normal expiration.

B. Plans showing new City facilities or repairs and maintenance of existing facilities must be placed on the Oregon State Plane Coordinate System, South Zone, North American Datum of 1983 (NAD 83), and elevations shall be referenced to the North American Vertical Datum of 1988 (NAVD 88). Upon review by Site Plan Committee, projects that are small or simple in nature may be exempted from this requirement, and may be placed on assumed coordinates and elevations.

C. In addition to City of Brookings approval, other jurisdictions have authority over certain types of projects, and their approvals are also required. It is not feasible for the City to keep the documents of other jurisdictions current with this document. An applicant is advised that there may be requirements from Oregon Department of Human Services, Health Division, Oregon Department of Environmental Quality, other State and Federal regulatory agencies and Curry County Road Department not kept current in this document. City will make every effort to keep said agencies requirements current, on file and perform an advisory role to help an applicant obtain approval from other jurisdictions. The City of Brookings has obtained authority for plan review on water systems by the Oregon Department of Human Services, Health Division, which will permit local review of planned water improvements by the City. An additional fee for plan review will be assessed on each project for which this applies.

D. Construction Plan Requirements: Plans shall be submitted in a scale that allows for easy reading, but shall not be produced on paper larger than 24-inch by 36-inch. Vertical plans shall be drawn in an exaggerated vertical scale of 10 times the horizontal scale, and contain the following general information:

1. A vicinity map, north arrow and scale bar.

2. A title block that includes name and addresses of the applicant and/or his agent, sheet title and page number, and date and revision number.

3. A plannemetric map (bird's eye view) showing the location of all existing structures and facilities, and proposed facilities, both above and below ground within the project area. By example, but not limited to, show the right of way boundaries of adjacent streets, their edge of pavement and physical and actual centerlines, curb and gutter, and pedestrian facilities.

4. Topographic data in contours or spot elevations or both.

5. All existing and proposed easements not in rights-of-way that are pertinent to the project shall be shown on the plans.

6. When applicable, a centerline profile is required with typical stationing which indicates the location of any cross-section details.

7. When applicable, a below grade cross-section detail showing all proposed underground improvements and their relationship to existing underground utilities.

8. When applicable, cross section details showing proposed improvements such as curb gutter and above grounded utilities with spot elevations.

9. In order to achieve a matched layering affect, the various plan and profile views and cross-section details of water, sewer, storm water facilities and street improvements must be kept on the same scale and stationing throughout the plan sheets.

10. Electrical plans

a. Shall show the location of all existing and proposed electrical utilities such as lines, transformers, pedestal-type connection points, conduit size and lengths, power source connections and street light circuits and controls.

b. Location in trench section detail (including proposed telephone and/or television transmission lines). [Ord. 91-O-484 § 1(1A.07.e). Formerly 16.15.110.]

11. The drafted plans must clearly differentiate between on- site and off-site, existing and proposed improvements. Use diverse pen weights, shading, and line types, or draw the various improvements on separate sheets.

E. Final as-built plans:

1. Within 60 days of project completion submit final plans showing all project information, as-built changes, a copy of newly recorded easements and include:

a. One original map on 4-mil double mat Mylar, in archivable ink; and 2 paper copies on 20# bonded white paper.

b. For those projects completed on computer software, submit electronic files in Autocad compatible ".dwg" or ".dxf" extension formats, copied to an archivable CD disk.

18.05.009 REIMBURSEMENT PROCEDURES

Whenever an original developer as defined in BMC Chapters 17.168 or 17.170 provides, pays for, installs, or causes an extension of services to be installed, BMC 17.168.020 (F) authorizes this document to establish a reimbursement procedure. As outlined herein, said developer shall be entitled to reimbursement of a portion of his approved costs for up to 10 years in accordance with the following criteria and procedures:

A. The original developer seeking reimbursement must submit, within 90 days of acceptance of said improvements by the City, an accounting of the actual costs in performing the off-site infrastructure improvements. Actual costs shall be reviewed by the City, which shall then determine the amount of "Approved Costs."

B. Upon the request of the original developer, City shall prepare a reimbursement agreement between City and developer whereby the original developer may recover those portions of the cost of the improvements through a special connection fee collected from other benefitting property owners. The maximum term of said agreement shall be 10 years after City Council approval.

C. City shall identify those properties that are or have a potential to benefit from the infrastructure improvements installed by the original developer, including the properties of the original developer. City shall prepare an analysis indicating how the approved costs would be allocated to all benefitting properties. Such analysis shall, generally, be in the same manner as the procedure used in determining benefit in the formation of a Local Improvement District, but may also include other factors such as parcel size, zoning and property characteristics. Said apportionments shall become a "special connection fee" appurtenant to the benefitting parcels which are not a part of the original development. Said special connection fee shall be collected at the same time as the City collects connection fees and System Development Charges from the identified parcels.

D. Special connection fees collected in accordance with this provision shall be remitted to the original developer within 60 days of receipt by the City. The actual cost to the City in determining the special connection fee cost allocation and in administering the agreement shall be deducted from the amount of reimbursement.

E. City Council approval of the reimbursement agreement is required.

END OF DIVISION

Chapter 18.10
Division 2
Standard Construction Workmanship

18.10.001 CONSTRUCITON SITE EROSION AND SEDIMENT CONTROL

A. Depending upon topography, size, proximity to waterways, State and Federal regulations may apply, and relevant agency approvals must be obtained.

B. Projects that disturb more than an acre require a NPDES 1200-C permit from DEQ.

C. Discharge from dewatering operations shall not directly impact existing watercourses.

D. The contractor will implement Best Management Practices (BMPs) for protection of ground water and dust abatement. Turbidity shall not exceed 10 percent above natural stream turbidities as a result of any project. The turbidity standard may be exceeded for a limited duration, provided all practicable erosion control measures have been implemented, including, but not limited to:

1. Use of filter bags, sediment fences, silt curtains, leave strips or berms, placing mulch and hay bale silt fences, or other measures sufficient to prevent offsite movement of soil.

2. Use of an impervious material to cover stockpiles when unattended or during a rain event.

3. Graveled construction accesses to prevent movement of material offsite via construction vehicles.

4. Spreading mulch on exposed embankments greater than 3 feet in height.

5. Constricting hay bale silt fence at toe of embankments greater than 10 feet in height. Place bales at any locations where soil erosion potential is evident and as directed by the City.

6. Erosion control measures shall be maintained as necessary to ensure their continued effectiveness.

7. Petroleum products, chemicals, or other deleterious materials shall not be allowed to enter the water.

18.10.002 DUST ABATMENT

The contractor shall maintain all work areas reasonably free from dust. Methods of abatement such as sprinkling, chemical treatment, light bituminous treatment, or similar methods shall be used. Sprinkling must be repeated in intervals that keeps the ground damp at all times.

18.10.003 CLEARING, GRADING, EXCAVATION AND GRUBBING

A. Contractor is responsible for removing and disposing of all vegetation. The following are considerations:

1. The contractor shall remove all cleared materials to approved disposal sites. In some instances burning is allowed. Burn permits are required.

2. All stumps, roots and other embedded wood shall be completely removed.

3. Any holes created shall be filled with a suitable material and compacted.

4. Safety barricades, covers and warning lights shall be implemented.

5. Land clearing in sensitive areas, such as, delineated wet lands is not allowed.

B. Grading, clearing and excavation of street rights-of-way and private property meeting the definition of BMC 17.100 shall be performed under the supervision of an engineer or geologist who is knowledgeable and skilled in the treatment of soils, soil stabilization, and soil erosion. Due consideration shall be given to the existing terrain, cross-slope and vegetation. City approved construction plans a public works permit is required.

18.10.004 MULCHING

Seeded areas and mulched areas which become damaged shall be restored by the contractor to previous conditions.

18.10.005 FIELD CHANGES

During the normal progress of construction minor relocations of improvements or horizontal and vertical deviations may be necessary. City or other jurisdictions having authority must be notified and prior approval obtained.

18.10.006 PUBLIC SAFETY AND CONVENIENCE

A. The contractor shall comply with all rules and regulations of City, County, State, and Federal authorities regarding the closing, detouring, and load limits of all public streets or highways. No road, public or private, shall be closed or detoured by the contractor except by permit from the City or other jurisdiction such as ODOT and the County. Traffic must be kept open on all roads and streets when no detour is possible. The contractor shall, at all times, perform his work assuring the least possible obstruction to traffic.

B. Access for Police, Fire, Postal, Ambulance, and School Bus Service. The contractor shall notify the Brookings Fire Department, Police Department and when applicable, the School and Postal Service before closing or portions thereof.

C. The contractor shall furnish, install and maintain suitable signs, lights, plating, barricades, fences or other protective measures to insure the safety of the public and construction crew.

D. Contractor shall coordinate the work with all local utilities, affected private property owners, and other affected public agencies.

E. School Crossing Supervision – Modified from Oregon Supplement to MUTCD Section 7E.05, adult cross guards shall use school flags. A STOP paddle is not permitted.

18.10.007 CONSTRUCTION SAFETY MEASURES

Contractor shall comply with all Oregon OSHA requirements.

18.10.008 COMPLIANCE WITH REGULATORY REQUIREMENTS

Contractor shall at all times observe and comply with all Federal and State laws and obtain all necessary permits prior to construction.

18.10.009 BARRICADES, WARNING SIGNS AND TRAFFIC CONTROL

Signs, flags, lights, and other warning and safety devices shall meet the ODOT requirements as outlined in "Temporary Traffic Control Handbook". In addition, depending on the length of time, the Federal "Manual on Uniform Traffic Control Devices" may apply.

18.10.010 SCHEDULING

Prior to issuance of a Public Works permit, the City shall review and approve an overall schedule for completion of the work and inspections. The contractor is expected to provide 48-hours notice prior to commencing construction and 24 hours for inspections.

18.10.011 RESTORATION AND SITE CLEANUP

Worksite shall be kept clean and orderly at all times and shall be free of excess material and rubbish. Restore all impacts to the original condition or better.

18.10.012 PROTECT IN PLACE

All existing improvements, utilities, and properties both inside and outside the public right of way, surface and subsurface shall be protected from damages by the contractor.

END OF DIVISION

Chapter 18.15
Division 3
Road and Earthwork

18.15.001 GENERAL

A. Earthwork is defined herein as road work, surface and subsurface excavation and backfill in the public right of way or easement dedicated to the City or earthwork associated with grading for new development.

B. Aggregate base is defined herein as crushed rock import used for backfilling subgrades capable of passing through a defined screen size and provides a structural element to the backfill.

C. If unfavorable weather conditions necessitate interrupting filling and grading operations, prepare areas of compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage.

D. Shoring, sheeting and bracing is required per Oregon OSHA Standards.

18.15.002 EXCAVATIONS AND BACKFILL REQUIREMENTS

A. Definitions:

1. 95% compaction backfill standard is defined as backfill materials or soils densified to a 95 % "maximum density" when tested in accordance to AASHTO method T-99 (Standard Proctor). Compaction equipment shall be utilized in fills in layers not to exceed 12 inches. The burden of proof of meeting compaction requirements is placed on the contractor. If the City requires additional compaction tests and those tests fail, the contractor is responsible for the costs of the tests. If those compaction tests pass, the City shall pay for the tests.

2. Subsurface investigation is defined as physical efforts to bore and/or pothole to determine the underlying soil type and conditions. A geotechnical engineer and/or Proctor test is required when there is a question on the characteristics of the subsurface for compaction.

B. Excavations/types:

1. Surface:

a. Pavement removal and replacement: Trenches placed in existing paved streets shall provide for a "T" type patch per standard detail number 3-2. This will require an initial and final sawcut just prior to paving.

b. Curb removal. Curbs shall be sawcut through their full thickness and removed. If the adjacent panel is broken, replace the entire panel.

c. Sidewalk removal shall include replacement of the panel between control joints. If the adjacent panel is broken, replace the entire panel.

d. Land clearing and grubbing. Removal of vegetation shall comply with Division 2 Section 3 of the Standards and Specifications.

2. Subsurface:

a. Trench excavation is defined as any man made cut required for undergrounding of infrastructure, repair, or maintenance of utilities. The trench width must provide a clear working space of 6 inches on each side of the pipe for pipes 4 inches in diameter and larger.

b. Potholing of existing utilities is required to verify location, material, and size prior to trench excavation. Potholing is required for all critical and conflicting infrastructure, such as high pressure water mains, sewer interceptors, gas mains, and other utilities that must be protected in place.

c. Foundation stabilization excavation is removal of additional subgrade soil that in the opinion of the Engineer is structurally unsound to use as subgrade. This is determined by the Proctor test or field inspection such that the backfill is unable to compact consistently and evenly. These soils are usually high in clay and/or organic content and are not able to compact to 95% compaction as measured in the Proctor Test.

d. Rock excavation is determined by the City when an excavator of the 44,000 pound class, such as Caterpillar 320D L, or equivalent equipment, is unable to excavate the site and requires drilling. Blasting is prohibited.

C. Backfills

1. Definitions:

a. Class I and II backfill is defined as native material excavated from within the limits of the project, free from vegetation or materials that interfere with compaction and have a maximum particle size of 3 inches. To be approved for trench backfill, these native materials must meet the desired characteristics for surface loading for that location.

b. Class III backfill is defined as 3/4inch minus or 1-1/2-inch minus crushed rock that conforms to the requirements of Section 02630 of the ODOT / APWA Standard Specifications for Construction, except 70 percent of the particles, by weight, shall have at least one mechanically fractured face based on grading requirements of the section. The fracture requirements shall be applicable uniformly through the grading materials involved. (All gravel sizing shall have fracture faces applicable by screen sizes to the 70% level). In section 02630.10(c) the sediment height requirements shall be 3½ inch maximum.

c. Class IV, Controlled Low Strength Material (CLSM) backfill is a highly fluid lean concrete mix of fly ash or slag, Portland cement, fine aggregates and water which results in a dense, non-settling fill, when cured, that can be later broken with hand tools. CLSM shall conform to Section 00420 of the current version of ODOT/APWA Standard Specification for Construction, modified in the following manner: Class IV subgrade must be able to be remove with a hand tool.

d. Road embankment is defined herein as backfill required for the structural integrity of a road. Contractor must submit stamped geotechnical

or civil engineering plans for approval of any road embankment work and is subject to regulatory approval when near a waterway.

e. Foundation Stabilization backfill is a granular material used to stabilize the bottom of a roadway subgrade or pipe trench below the pipe zone. The material shall be 2-inch minus imported crushed rock conforming to ODOT standards 2630 excepting the sediment height requirements shall be "3.5" maximum."

D. Roadway and Subgrade Backfill Requirements

1. Utility Trench

a. Top leveling rock. Aggregate base 3/4-inch minus crushed rock conforming to the requirements for aggregate base as specified in Section 02630 of the ODOT standards 2 inch minimum depth in roadway. In some instances other 3/4-inch or minus material, such as recycled asphaltic pavement, can be used subject to City approval.

b. Roadway base course beneath the top leveling rock within the right of way shall be compacted to achieve a depth of at least 4 inches of 1½-inch or minus crushed rock confirming to ODOT standard 2630. Aggregate base shall be placed and compacted in maximum of 6-inch lifts.

c. Trench backfill within paved areas (new and existing) shall be Class III backfill aggregate base consisting of ¾-inch or 1-inch minus crushed rock and conforming to the requirements for base aggregates in Section 02630.10 of the 2008 ODOT Standard Specifications for Construction except in Section 02630.10 (c) Sediment height requirements shall be "3.5" maximum."

d. Native soils may be used for backfilling trenches between the roadway base and pipe zone or outside of roadways providing they can meet compaction standards and provide a sound subgrade. Lifts shall not exceed 6-inches.

e. Pipe Zone - Bedding material placed in the pipe zone shall be ¾ inch to minus to the extent of the pipe zone. The pipe zone is defined as the full width of the trench from within 6 inches below the pipe to 6 inches above the pipe barrel.

f. Foundation stabilization zone as previously defined herein.

g. Paving fabric shall be considered for installation on a case by case bases.

2. Curb, sidewalk and catch basins

a. Aggregate base 3/4-inch minus crushed rock conforming to the requirements for aggregate base as specified as top leveling rock herein or ODOT standard 02630.

3. Manholes

a. Poured in place base – Subgrade shall be native material compacted to a minimum of 90% compaction or foundation stabilization if determined necessary by the City.

b. Prefabricated base – Subgrade shall be Class III compacted to 90% and leveled.

E. Workmanship

1. Contractor to notify the City 24 hours prior to placement of subgrade.

2. Final grades shall be within a 0.5-inch tolerance, any drainage impacts due to altered grades are the responsibility of the contractor.

3. Cleanup. All materials and soils are to be disposed of or recycled from the construction site and adjacent areas in a timely manner. Disposal of all waste materials shall conform to all laws, regulations, and ordinances.

18.15.003 ROADWORK

A. Asphalt Concrete (AC) Pavement

1. General

a. Depth of AC determined by, existing road conditions, and traffic conditions on roadway. Minimum 3" AC installed in one lift and 4" AC depth installed in two, 2-inch lifts.

b. Materials

i. Asphalt concrete shall be ½" Dense Graded Mix (formerly called Class C) conforming to Section 00745 of the ODOT Standard Specifications for Construction. For a typical street, a Level 2 Hot Mix Asphaltic Concrete (HMAC) shall be utilized. Projects with heavy commercial or industrial traffic may require the use of Level 3 HMAC at the discretion of the City.

ii. Asphalt tack coat shall conform to Section 00730.11 of the ODOT Standards and Specifications.

2. Workmanship

a. Minimum AC temperature at the time of placement shall be 250° F and shall not be placed when the ambient temperature is below 40° F.

b. Weather conditions – AC to be installed in favorable weather conditions for curing and meeting compaction requirements.

c. Surfacing of the AC after compaction shall be smooth and true to established cross section and grade. There shall be no sign of roller marks, loose or broken surface, and when compacted shall conform to the existing grades.

d. Do not leave subsurface exposed to traffic. Temporary measures shall be made for roadway surfaces by installing cold patching or plating an open trench.

3. Compaction and Lifts

a. Shall be at least 92 percent as determined by AASHTO T-230 for each lift. Additional lifts shall not be placed on top of a lift that has not yet met the recommended compaction level.

b. Lifts shall not exceed a compacted depth of three (3) inches.

4. Testing

a. The City will use discretion to determine if laboratory and field testing will be required. If the testing results conclude that the AC composition or installation does not meet standards, the contractor is responsible for all testing charges and shall remove and replace the AC to standard.

B. Tack coat

1. Install at contact surfaces of manholes, catch basins, gutters and existing pavements. Do not place on wet surfaces.

2. Install at joints between the existing and the new AC pavement.

C. Striping

1. General

a. Materials

i) Thermoplastic shall be white, preformed with LKF Type 1 top beading suitable for asphalt or concrete applications. Apply in accordance with Section 02840 of the current edition of ODOT/APWA Standard Specifications for Construction.

ii) Paint

2. Crosswalks and Stop Bars width shall be 12 inches.

3. Centerline, traffic lanes, bike lanes, and parking lanes width shall be 4 inches.

4. ADA per current building code and standard details 3.15 and 3.16.

5. School crossings per current MUTCD.

6. Workmanship

a. The pavement surface shall be free of dirt, grease, moisture, and other foreign material prior to placement of striping and pavement markers. Air blast the pavement with an acceptable high-pressure system to remove loose or foreign material.

b. Apply at a temperature of 400 – 500 deg F. Minimum drying time shall be 10 minutes based on 50 deg F and slight wind.

c. Limits of striping shall comply with the area disturbed by construction.

END OF DIVISION

Chapter 18.20
Division 4
Utilities

18.20.001 DEFINITIONS

A. This section contains specifications for water, sewer and storm drain material and installation requirements.

18.20.002 GENERAL

A. As determined by the City, the City may require parts and material submittals prior to issuance of a Public Works permit.

B. Civil engineering plans will be required unless determined by the City that the improvements are minor and pose no risk for damages or safety.

C. All domestic water system designs and construction shall be in accordance with OAR 333-061-0050, Department of Human Services Health Division and as supplemented here.

D. All sanitary sewer design and construction shall be in conjunction with OAR 340-52 and Oregon Department of Environmental Quality "Sanitary Sewer Design Notes" and as supplemented here.

E. All projects impacting storm water surface run-off shall be directed to the Oregon Department of Environmental Quality1200-C permit for applicability.

F. Refer to the applicable ASTM and AWWA standards for detailed specifications on pipe materials.

G. This document sites manufacturers' materials that are commonly stocked by suppliers in Southern Oregon.

H. Alternative materials will be considered by submittal and is outlined in Division 1 18.05.006.

I. All parts and materials shall be new and unused.

J. Any poured in place concrete shall be in accordance with Division 5 Concrete specifications unless otherwise specified herein.

K. All materials shall be installed according to manufacturer's recommendations.

L. Inspect all pipe and fittings prior to lowering into trench to ensure no cracked, broken or otherwise defective materials are used. Prevent foreign material from entering the pipe while it is being placed in the trench. Remove all foreign material from the inside of the pipe and joint before the next pipe is placed. Clean ends of pipe thoroughly. Keep debris, tools, rags or other materials out of the pipes at all times. Follow pipe-laying operations closely with joint coating operations as required and backfilling of trenches as specified in Division 3 of these Specifications.

M. Joint deflection and pipe bending for radial curvature shall not exceed the manufacturer recommendations.

N. Do not drop or dump pipe into trenches.

O. Refer to Division 3 herein for subgrade requirements.

P. Deviation from alignment on plans must be approved by the City.

Q. Provide concrete thrust blocking in accordance with the standard details at the end of this division. Allow concrete to cure to needed strength prior to charging the main.

R. Tracing wire is not required for gravity sewer and storm drain installations.

S. Proper measurements of OD, approved fittings and materials, and adequate staff is available to construct the improvements must be demonstrated to the City prior to shutdown of any water main.

Table 4.1 Piping Schedule
Allowable Piping Materials for the City of Brookings Utility Construction

Type		Application	Size	Material	Specification	Interior surface or coating	Pipe end
Storm Drain	Gravity	Main	All	HDPE	ADS N-12, WT	Corrugated outside, inside smooth	Push on gasket
	-	Main	4"-15"	PVC	SDR 35, ASTM D-3034	NA	Push on gasket
	-	Main	18" and greater	PVC	SDR 35, T-1 thickness ASTM F-679	NA	Push on gasket ASTM F-477
		Main	All sizes	Aluminized steel	Type 2 AASHTO M-274 971	Corrugated metal	
	-	Main	18" and under	Concrete	Class 3 reinforced ASTM C-76	NA	ASTM C443/ AASTO M198
	-	Main	21" and larger	Concrete	Class 3 reinforced ASTM C 76-74	NA	ASTM C443/ AASTO M198
	-	Laterals	2"	PVC	Not used, smallest size 4"	NA	NA
	-	Laterals	4" -15"	PVC	SDR 35, ASTM D-3034	NA	Push on gasket
Sewer	Gravity	Main	4"-15"	PVC	SDR 35, ASTM D-3034	NA	Push on gasket
	-	Main	18" and greater	PVC	SDR 35, T-1 thickness ASTM F-679	NA	Push on gasket ASTM F-477
	-	Lateral	4"	PVC	SDR 35, ASTM D-3034	NA	Insert a tee
	Pressure	Main	4" - 12"	PVC	AWWA C-900, DR 18, CL-150	NA	MJ Fitting, Bell and Spigot Main Connection
	-	Main	> 12"	PVC	AWWA C-905, DR-18, CL-235	NA	MJ Fitting, Bell and Spigot Main Connection
Water	Pressure	Lateral	3/4" and 1"	Polyethylene	Pressure class 200, IP Sized, HDPE	NA	IP compression
		Lateral	2"	PVC	Schedule 40	NA	Glued
		Main or Lateral	4" - 12"	PVC	AWWA C-900, DR 18, CL-150	NA	MJ Fitting, Bell and Spigot Main Connection
		Main	> 12"	PVC	AWWA C-905, DR-18, CL-235	NA	MJ Fitting, Bell and Spigot Main Connection
		Main	4-12"	DI	CL 52	Cement lined	Flg, MJ, or push on
		Main	Any	HDPE	Upon special consideration	NA	Fusion
		Air Vac assembly	2"	Brass	CL 125 ANSI/ASME B16.15	NA	Threaded nipple per ASTM B687-88

18.20.003 STORM DRAIN

A. General

1. Design Consideration – Pipe material and size is dictated by depth of pipe, slope, hydrological and geological conditions and type of pipe and size selected shall be approved by the City. Hydraulic and hydrology calculations signed by a registered civil engineer may be required.

B. Materials

1. Main Line Pipe

a. Polyvinyl Chloride Pipe (PVC)

i. Small diameter Main (under 15 inches) shall be SDR 35 conforming to ASTM D-3034.

ii. Large Diameter (18 inches and greater) shall be SDR 35, T-1 wall thickness with elastomeric gasket seals conforming to ASTM F-477.

iii. Gasket shall be an integral bell gasketed watertight joint in accordance with ASTM F-1803.

b. Corrugated High Density Polyethylene (HDPE) Pipe shall be ADS N-12 HDPE series 65 (smooth interior wall) as manufactured by Advanced Drainage Systems, Inc. or Hi-Q as manufactured by Hancor for pipe sizes 8 through 36 inches.

i. New installation – all new ADS N-12 pipe installation shall be constructed with push on water tight, gasket connections.

ii. Connection to existing ADS N-12 HDPE – when tying into existing ADS N-12 pipe with a new storm drain connection, install an Inserta Tee fitting.

iii. Couplings shall be corrugated to match the pipe corrugations, and the width shall be not less than 1/2 the nominal diameter of the pipe and shall engage an equal number of corrugations on each side of the pipe joint.

iv. Shall meet the requirements of high density polyethylene pipe requirements of AASHTO M252 and M294. Smooth interior coat required.

c. Concrete Pipe and Fittings

i. Required for pipe depths exceeding the recommended loading for plastic pipe.

ii. 18" and under shall be Class 3 reinforced pipe that conforms to ASTM C -76.

iii. 21" and larger pipe shall be Class 3 reinforced pipe that conforms to ASTM C 76-74

iv. All concrete pipe shall have rubber ring joints in accordance with ASTM C443/AASTO M198 "Joints for Circular Concrete Sewer and Culvert Pipe."

2. Corrugated Metal Pipe and fittings.

a. Corrugated Metal Pipe and fittings shall be round Aluminized Steel, Type 2 and shall meet the requirements of AASHTO M-274 971. Pipe and fittings shall be from the same manufacturer. Material thickness shall be 0.079 inch (14 gauge).

b. Pipe end connections shall be with manufacturer's joint strap/band that provides full 360-degree contact. Band couplers shall have a full annular corrugation at each end to prevent sliding and pulling apart. Joints shall have rubber "0" rings or neoprene strip gaskets providing watertight seal.

c. Aluminized Steel Pipe Type 2 by Contech, AK.

3. Laterals

a. Storm drain laterals shall be a minimum diameter of 4-inches.

b. Pipe material shall be PVC SDR 35, ASTM 3034.

c. New City owned lateral connections from catch basins are 12-inch minimum. Catch basin lateral connections shall include a manhole at the connection point to the new main.

d. New lateral connections less than 12-inches are private connections to existing gravity mains. Contractor may use Inserta Tee fitting or cut in tee that does not require a manhole.

4. Appurtenances

a. Catch basin

i. Shall be precast units shall be manufactured by Advantage Precast, Keizer, Oregon.

ii. Type – Application depends on drainage characteristics. Use a Type 2 catch basin for steeper slopes and a curb drain inlet for areas with less slope.

1) Type 2 Catch Basin Double Grate per standard detail.

a. Grate by D & L Foundry Model #I-450.

2) Curb inlet per standard detail.

b. Manhole Lids and Catch Basin Access ways shall be slotted cover Olympic Foundry H-20 loading, Model MH-26 G, with lettering "SD".

C. Testing - Testing of storm drain facilities shall be through visual inspection. Since there is no formal testing for gravity flow drainage facilities, special attention will be paid to workmanship and adherence of manufacturer installation requirements.

18.20.004 SANITARY SEWER

A. Gravity

1. Polyvinyl Chloride (PVC) Pipe

a. Small diameter Main (under 15 inches) shall be SDR 35 conforming to ASTM D-3034.

b. Large Diameter (18 inches and greater) shall be SDR 35, T-1 wall thickness with elastomeric gasket seals conforming to ASTM F-477.

c. Gasket shall be an integral bell gasketed water tight joint in accordance with ASTM F-1803.

d. Toning wire is required when pipe is installed with deflecting joints or "roping" pipe and when the pipe can not be bore sited.

2. Fittings

a. Flexible couplings for connecting PVC to existing concrete service lateral piping, shall be Fernco Series 1006.

b. Flexible couplings for connecting PVC to existing asbestos cement service lateral piping, shall be Fernco Series 1051.

c. Flexible couplings for lateral connections shall be of the appropriate Fernco Series 1006.

d. Provide wyes for all cleanouts.

e. End plugs to be installed for service laterals, sanitary sewer main stubs from manholes and wye fittings of cleanouts.

3. Laterals – refer to Standard Detail 4.11.

a. Existing sewer – Romac Tapping Saddle Style CB, sized for connecting pipe diameter. Stainless steel strap and bolts.

b. In new installations; service laterals shall only be made through a wye fitting per Standard Detail 4.11

c. Service lateral connections to existing systems shall use a standard (4") saddle truss type connector for each residence (IDU), and shall be placed a minimum of 18" apart.

d. In the event a service lateral is to be abandoned, it must be removed and capped (plugged) at its connection point to the main.

e. Tee-wye shall not be closer than 12 inches to any joint or bell of main line sewer main, which is 12 inches or less in diameter.

f. Provide ends of all service laterals or fittings with approved watertight end plugs, suitably braced to prevent blow-off during internal air testing.

g. Provide accurate horizontal and vertical measurements of new sewer service lateral inverts on as-builts.

4. Testing

a. General. Prior to final inspection the system must be flushed clean which includes manholes. The contractor is responsible for everything necessary to flush the system clean. It is permissible to use City fire hydrants for this purpose. Testing is performed after each section to be tested is (inspected), backfilled and compacted. DEQ requirements must be met. The project engineer is responsible to obtain the correct DEQ documents, perform the test, and submit the completed test results to DEQ. The City must be notified prior to the test and shall be present to witness the tests.

b. Air Test

i. All gravity sanitary sewers including service laterals shall successfully pass a low-pressure air test prior to acceptance and shall be free of leakage. Test first section of pipe laid, as hereinafter specified, to establish that the pipe material is capable of preventing infiltration and that the sanitary sewer mains are being installed to insure that infiltration of ground water will not exceed the amount set forth. Section of pipe tested shall be at least 300 feet in length. If test indicates infiltration exceeding amount specified, defective material or workmanship shall be corrected and test will be rerun until leakage is within the amount specified. Manholes shall be tested as specified in 5.D.1 herein.

ii. Place all air testing equipment above ground and allow no one to enter a manhole or trench where a plugged sewer is under pressure. Release all pressure before the plugs are removed. Testing equipment used must include a pressure relief valve designed to relieve pressure in the sewer under test at 10 psi or less and must allow continuous monitoring of test pressures in order to avoid excessive pressure. Use care to avoid the flooding of the air inlet by infiltrated ground water. (Inject the air at the upper plug if possible.) Use only qualified personnel to conduct the test.

iii. Contractor to perform air test prior to backfilling.

Table 4.2
DURATION AIR TEST PRESSURE DROP

Pipe Diameter (In)	Minimum Time (Min:Sec)	Length for Minimum Time (Ft)	Time for Longer Length (Sec.)
4	2:00	597	0.190 L
6	3:00	398	0.429 L
8	4:00	298	0.760 L
10	5:00	239	1.187 L
12	6:00	199	1.709 L
15	7:00	159	2.671 L
18	8:30	133	3.846 L
21	10:00	114	5.235 L
24	11:30	99	6.837 L
27	13:00	88	8.653 L
30	14:30	80	10.683 L

c. TV Test required for new subdivisions or pipe extensions exceeding 100 feet. Contractor shall conduct an internal television inspection of all installed mainline sewers and service laterals to the property line, with a movable eye internal camera that permits investigation of each lateral connection to the mainline. Lines shall be evaluated for compliance with Standard Specifications. Contractor shall provide a copy to City for review of complete color videotape in VCR compatible or digital format for review by the City. Inspection shall be conducted by a City-approved, licensed and bonded technical service, which is equipped to make an audio-visual record. A voice accounting of suspected deficiencies shall be made on the sound track. Inspection firm shall provide the City with written record of any problems noted, on a form approved by the City staff, with stationing and any noted concerns for needed corrective action. Video/digital report and written report shall be submitted to the City, and will become property of the City. If defects are noted in the television inspection, repairs shall be conducted to eliminate defects, and lines shall have a new television inspection provided under identical circumstances until all noted deficiencies are corrected. All costs shall be at developer's expense.

d. Mandrel Test. The Mandrel Test is conducted by pulling the test device through a completed sewer run from manhole to manhole. If the Mandrel gets caught in the pipe and cannot be pulled from manhole to manhole in a straight pass, then the line will fail the Mandrel Test. This test is required for all sewer main construction. Mandrel shall be appropriate size for the pipe to be inspected.

5. Workmanship

a. Minimum slope is 0.5%. Pipe design size shall be for optimum cleaning velocity.

b. Pipe to be installed with spigot end in the direction of flow. Take care to properly align the pipe before push on joints are connected.

B. Force Main

1. General

a. All pipe shall have a 150-psi minimum working pressure.

2. Polyvinyl Chloride Pipe (PVC)

a. There is no reference to pipe materials less than 4-inches since it is unlikely a City maintained force main would be less than 4-inches. Private force mains shall comply with the UPC.

b. 4-inches to 12-inches diameter shall be AWWA C-900, DR 18, Class 150 and conforming to the outer diameter of cast iron pipe.

c. Greater than 12-inches shall be incompliance with AWWA C-905, DR-18, Class 235.

3. HDPE will be considered on a case by case basis and upon approval by the City Engineer.

4. Restraints

a. Thrust blocks; see detail 4.52.

b. Mechanical Joint Fittings used with ductile iron and C900 PVC pipe shall conform to ANSI/AWWA C-110/A21.10 and ANSI/AWWA C-111/A21.11, or ANSI/AWWA C-153/A21.53.

c. Ductile iron fittings are not required to be cement mortar lined for force main sewer applications.

d. Joint restraints required on vertical and horizontal bends and fittings shall be manufactured of high strength ductile iron ASTM A536, Grade 65-45-12.

i. Foster Adapter shall be manufactured by Infact Corporation.

ii. PVC Pipe restrainers shall be EBBA Megalug Series 2000.

e. Testing

i. Please refer to potable water section for testing requirements.

C. Appurtenances

1. Manhole

a. Manhole connectors shall be flexible pipe to manhole to main sewer pipe to precast manholes and shall be KOR-N-SEAL® as manufactured by NPC Inc., Milford, New Hampshire.

b. Provide tees for drop manholes.

c. Manholes shall be formed as shown in the construction details herein.

2. Cleanouts

a. Sewer service lateral cleanouts shall be located in the right of way adjacent to property line. Refer to detail 4.11 herein.

b. Lateral cleanouts or main line cleanouts installed in traffic areas shall have a Christy G-5 traffic rated lid and concrete collar per detail 4.11 herein. Non traffic areas may use a 6-inch landscape round valve box with lid and no concrete ring is required.

3. Fittings

a. All fittings shall be of the same materials as the pipe unless otherwise specified.

b. Elbows to be installed for cleanouts.

c. Flex couplings for connecting PVC to existing concrete service lateral piping shall be Fernco Series 1051.

d. Flex coupling for connecting PVC to existing asbestos cement service lateral piping shall be Fernco Series 1051.

18.20.005 MANHOLE REQUIREMENTS (SEWER AND STORM DRAIN)

A. General

1. Please refer to the sewer and storm drain sections herein for particular requirements for sewer and/or storm drain manholes.

2. Where a full section of pipe is laid through a manhole, cut out the top section to the full width of pipe and diameter of manhole. Cover exposed edges of pipe completely with mortar.

B. Design criteria

1. Manholes shall be installed preferably every 400 feet but no greater distance than 500.

2. All manholes shall be concentric type unless approved by the City.

3. Refer to Division 3, "Road and Earthwork" for subgrade information.

4. Manhole diameters shall be in accordance with the following:

Table 4.3 - Manhole Sizes

Pipe Diameter	Manhole Diameter
6" – 18"	48"
21" - 42"	60"
48" – 54"	72"
Greater than 54"	Engineered vault

C. Types

1. Poured in place manhole base

a. Construction of a poured in place manhole base requires formwork. Forms for exposed surface shall be steel, plywood or other approved

material. Trench walls, large rock or earth is not an approved form material.

b. Portland Cement concrete shall conform to ASTM C-94, Type II. Compressive strength for bases shall not be less than 3,000 psi for 28 days. Maximum aggregate size shall be 1-1/2 inch with no more than a 5-inch slump.

2. Precast manhole

a. Contractor to provide factory submittal verifying that the manhole complies with ASTM C-478.

i. Minimum wall thickness is 5-inches. Cones shall have the same thickness and reinforcement as manhole sections.

ii. Keylock joints grouted and sealed tight with jointing material described herein.

iii. Jointing materials

1) Mortar – shall conform to ASTM C-387 and adhere to the concrete and comprise of one part Portland Cement to two–parts clean Mason's sand passing a 1/8-inch screen.

2) Ram-Nek or Kent-Seal shall be installed at all jointing sections.

iv. Grade rings

1) General. Install to the subgrade as indicated in the standard details.

2) Height. New construction of manholes will have a grade ring no greater than 6-inches height. Existing manholes brought to grade shall not have greater than 18-inches of grade rings. If greater than 18-inches, Contractor will replace the barrel.

3) Installation shall be plumb.

b. Frame, Cover and Collar

i. Set frames in concrete collar with collar being 12" wide, rectangular or circular, and a minimum of 6" depth. Allow for 2" AC lift to grade and tack to manhole cover.

ii. Traffic rated to H-20 loading.

iii. The bearing seat shall not rock when checked with a testing jig.

iv. Manhole frames and covers shall be Olympic Foundry Co., Inc., Part Number MH626S with "S" for sewer and "SD" for storm drain on lid.

v. Manhole paving risers shall be Olympic Co. Inc., Part Number MH26R.

c. Manhole Connector

i. A flexible manhole connector shall be installed for precast storm and sewer manholes.

ii. The connector shall be KOR-N-SEAL.

d. Abandonment of Manhole Stubouts

i. Abandonment of existing stubouts shall be sealed and at main line with a "T" cone expandable plug connection by ETCO Specialty Products, Inc.

3. High Density Polyethylene (HDPE) Manholes with a maximum height of 12 feet and an outside diameter of 48 inches may be used in place of precast concrete manholes as approved by the City Engineer and considered on a case by case basis.

D. Testing

1. Vacuum test

a. General. All manholes shall be vacuum tested that consists of plugging all inlets and outlets and applying a 5 psi or 10-inch Hg vacuum to the manhole. The allowable vacuum pressure loss shall not exceed 1 psi or 2 inches Hg for the time period stated below.

Table 4.4 - Vacuum Test

Depth of Manhole (ft.)	Duration (sec) required for manhole diameters	
	48"	60"
8	20	26
10	25	33
12	30	39
14	35	46
16	40	52
18	45	59
20	50	65
22	55	72

E. Toning Wire and Tape

1. Toning wire shall be No. 12 AWG, solid copper with green-colored insulation. Only installed on sewer pressure force mains, clean outs and laterals.

2. Underground warning tape shall be 6-inch wide, APWA standard green color, reading "Caution – Sewerline Buried Below."

3. Workmanship

a. Wire and tape shall be buried the entire length of trench and placed above pipe per standard trench detail drawing.

b. Tape shall be placed over the pipe zone material, approximately 6 inches above top of installed pipe. Lay flat and untwisted.

c. Wire shall be brought towards the surface of cleanout.

18.20.006 POTABLE WATER

A. General. All materials must be approved for use in potable water systems.

1. Pipe

a. Main

i. PVC and Fittings

1) Pipe under 4-inch diameter shall be Schedule 80, Type 1, Grade 1, NSF approved, conforming to ASTM D-1785. Joint shall be solvent welded slip type. Solvent cement shall conform to ASTM D 2564.

2) Pipe 4-inches to 12-inches diameter shall be AWWA C-900, DR 18, Class 150 and conforming to the outer diameter of cast iron pipe.

3) Pipe greater than 12-inches shall be in compliance with AWWA C-905, DR-18, Class 235.

4) All fittings shall be mechanical joint conforming to AWWA C-111, cement line ductile iron, unless a fully restrained fitting is required.

ii. Ductile Iron Pipe and Fittings

1) Centrifugally cast ductile iron pipe and spools shall be Class 52 conforming to AWWA C-151 and AWWA C-150.

2) Ductile iron shall be cement lined on the inside conforming to AWWA C-104. Outside coating shall be a bituminous coat 1 mil thick, conforming to AWWA C-151.

3) Joints shall be mechanical joint conforming to AWWA C-111. The bell shall be cast integrally and the pipe shall be provided with an exterior flange and socket with annular recesses for the sealing gasket. Provide sealing gasket, follower gland with boltholes, black iron tee headed bolts, washers and hexagonal nuts.

4) Flanged joints shall meet AWWA C-115. The bolt circle and hole spacing shall conform to ANSI B16.1, Class 125.

5) Gasket material for flanged joints shall be commercial neoprene conforming to ASTM D 2000 approved for potable water.

iii. HDPE only used in special cases as approved by the City Engineer.

iv. Brass pipe pressure class 125 or greater meeting ANSI/ASTM B16.15 for combination air and vacuum release and blow-off valves. Threaded brass fittings to conform to ASTM B687-88.

b. Service and Lateral Assembly

i. 1" laterals shall be polyethelene (HDPE) pipe pressure class 200, IP sized pipe.

ii. 2" laterals shall be Schedule 40 PVC pipe.

iii. Corporation stops. Corporation stops used with ¾-inch and 1-inch tap shall be Ford Meter Box Company, Type FB1101-3 or Type FB1101-4. Stop shall be furnished with iron pipe thread inlet and PE pack joint outlet, IPS.

iv. Gate valves are used for 2-inch services and greater as specified in the gate valve section herein. Ends shall be IP thread.

v. Angle meter stop

1) Angle meter stops used with 1-inch polyethylene pipe shall be Catalog No. BA63-332W and BA63-444W respectively, as manufactured by Ford Meter Box Company.

2) Angle meter stops that use 2-inch PVC pipe shall be Catalogue Nos. BFA 13-666W and BFA13-777W, respectively, as manufactured by Ford Meter Box Company. Reinforced rubber gaskets required. Furnish angle meter stops with male iron pipe thread by iron pipe PVC pack joint coupling.

vi. Meter box

1) Service boxes for ¾-inch and 1-inch service meters shall be Christy, B-12 for ¾-inch and 1-inch.

2) Double meter installation in one service box shall be Brooks No. 11-2. If double service box is utilized installation shall use a bronze manifold for meters part #UVB63-42W.

3) Meter boxes for 1½-inch and 2-inch meter services shall be Brooks No.36H.

vii. See Appurtenances Section herein for service connection tapping saddle requirements.

2. Fittings

a. All fittings to be ductile iron fittings cast iron sized. Fittings shall be cement mortar lined, 250 psi working pressure. Cement mortar lining must not be damaged or compromised.

b. Compression fitting to be installed for 1" water services with IP connector.

c. Mechanical Joint Fittings used with ductile iron and C900 PVC pipe shall conform to ANSI/AWWA C-110/A21.10 and ANSI/AWWA C-111/A21.11, or ANSI/AWWA C 153/A21.53.

d. Joint restraints required on vertical and horizontal bends and fittings shall be manufactured of high strength ductile iron ASTM A536, Grade 65-45-12.

i. Foster Adapter shall be manufactured by Infact Coporation.

ii. PVC Pipe restrainers shall be EBBA Megalug Series 2000.

e. Couplings

i. Contractor to verify pipe outside diameter for proper coupling size.

ii. Cast coupling and cast reducing couplings. Transition and straight couplings shall have ductile iron sleeve and end rings and resilient gaskets. Furnish with corrosion resistant, high strength, stainless steel SS 316 bolts and nuts. Supply coupling and assembly with fusion – bonded epoxy coating and lining.

iii. Couplings shall be Ford FC2A ductile iron transition coupling, Romac Macro ductile iron coupling.

iv. End Caps. End cap couplings shall have ductile iron sleeves, end rings, and end caps and resilient gaskets, Smith Blair "482", Romac "EC501". Furnish with corrosion resistant, high-strength, low alloy bolts and nuts. Supply with fusion bonded epoxy coating and lining. All end caps shall have a blow-off assembly as shown in Detail 4.35.

3. Appurtenance

a. Fire hydrant

i. Location of fire hydrants shall be as directed in the BMC Title 17 "Land Development Code" and under the direction of the Fire Chief.

ii. Hydrants shall be Waterous "Pacer." No other hydrants will be considered.

iii. Shall be AWWA C502 Compression type, 250-psi working pressure, dry barrel with main valve to remain closed if barrel should be accidentally broken. Length of barrel shall be field determined but must maintain a minimum of 3' of bury over the top of pipe and hydrant shall be installed to finish grade, with base flange 6-inch above adjacent ground. Riser extensions will be permitted if needed to maintain these conditions.

iv. Hydrants shall have "0" ring seals, rugged main valve, positive drain valve, bronze weather cap, and non-kinking chains. Hydrants shall have bronze to bronze seat retainers and bronze cap nuts. Entire valve mechanism, including drain valves, must be easily removed without digging. Hydrant shall be capable of 360-degree rotation on stem. Operating nut shall be 1½ inch pentagon, National Standard, counter-clockwise opening.

v. Each hydrant shall be equipped with two, 2½-inch hose nozzles and one, 4½-inch threaded pumper nozzle all with National

Standard threads. Size of hydrant valve opening shall be 5¼-inch. Hydrant inlet shall be mechanical joint.

vi. Fire Hydrants shall be backed by manufacturer's five-year warranty on materials and workmanship. Hydrants shall meet or exceed AWWA C502. Color shall be painted with Krylon Industrial Rust Tough color equipment yellow, #R0481.

vii. Barrel extensions shall be manufactured by the hydrant manufacturer.

b. Valve

i. Valve extensions are required when the turning is greater than three feet below grade.

ii. Gate valves are required every 400 feet, on all legs of tees and crosses, fire hydrant runs and on 2-inch water services.

1) Gate valves shall conform to AWWA C509 resilient wedge gate valves. All internal parts shall be accessible without removing the body from the line. The wedge shall be cast iron encapsulated in resilient material in accordance with ASTM D 429. Non-rising stem shall be cast bronze and be manufactured to open when the stem is rotated counterclockwise. Furnish with a 2-inch square operating nut. Valve shall be 200-psi working pressure and factory hydrostatically tested at 400 psi. The stuffing box shall have two "O-Ring" seals above the thrust collar. Bonnet bolts must be tightened before installation. Valve trim shall be 316 SS.

2) Special note should be taken of the end configuration of valves as indicated on the drawings for various installation conditions. Flanged and mechanical joints on valves shall conform to pipe materials specifications. Gate valves used with combination air and vacuum release and blow-off valves shall be furnished with iron pipe threads.

3) Coating shall be fusion bonded epoxy for the body and bonnet. Interior and exterior coating per AWWA C550.

4) Pressure zone valves shall be supplied with a 5-sided nut.

5) All valves shall be inspected for shelf life. If the shelf life exceeds two years, the valve condition may warrant rejection and the City may require testing certification that it is still in compliance with AWWA standards.

iii. Butterfly valve. Install for buried service, 14-inch pipe main size and larger.

1) Butterfly valves shall conform in all respects to the physical and performance requirements of AWWA C504, short body type having operators suitable for direct burial. Furnish Class 150B valves unless otherwise indicated. Furnish valves having two-inch square operating nuts which shall rotate counter-clockwise to open.

All valves shall be 150-psi working pressure, 300-psi test pressure and be furnished with a continuous rubber seat bonded to the body.

iv. Backflow

1) General

a) Backflows shall comply with OAR 333-061-0070.

b) Backflows supplied shall be certified as approved backflow prevention assemblies from one of the following institutions; University of Southern California, Foundation for Cross Connection Control and Hydraulic Research, or other equivalent testing laboratories approved by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research or as approved by the Department (see OAR 333-061-0070)

2) Reduced Pressure (RP) or Double Check Detection Valve

a) OAR standards 333-061-0070 Table 48 defines premises requiring RP and Air Gap backflow prevention, or double check depending on the risk of health hazard.

v. Air Release/Relief Valves

1) Combination Air Vacuum/Air Release shall be full body, fusion epoxy both internal and external with stainless steel 316 trim and accessories.

2) Valve shall have cast iron body, covers and baffle and stainless steel float, designed for normal usage of 150 psi. All other trim shall be stainless steel with the exception of Buna-N seat and adjustable Viton Orifice.

3) One 2-inch gate valve, IPxIP, installed at service connection and as specified shall allow removal and reconditioning of combination air/vacuum relief valve. Connections to water main shall be made through the use of specified service saddle.

4) Canister color green, 18"x30" enclosure manufactured by Pipeline Products Part #VCAS-1830.

vi. Valve box

1) Refer to standard detail 4.31.

2) Valve box shall be traffic rated when in roadway or driveway.

3) Shaft shall be 7-inch inside diameter. Cover shall be "lift pocket" type and lettered "WATER."

4) Boxes shall be Christy G5.

c. Blow off Assembly

i. Blow-off valves shall be constructed per standard details, with one 2-inch gate valve, as specified, installed for manual operation.

ii. Miscellaneous piping shall be lead free brass or PVC as specified in the standard detail.

iii. Connection to water main shall be made through use of specified service saddle or end cap.

d. Service Saddles (used for service connections)

i. PVC Pipe (AWWA C900)

1) Saddles with ¾-inch to 2-inch taps on 4-inch to 12-inch C900 PVC pipe shall be solid brass, with "O" ring gasket and silicon bronze screw. Supply with I.P. taps with single outside diameter to fit pipe size.

2) Saddle shall be Ford S-91 style.

ii. Transite (Asbestos Cement) and Ductile Iron Pipe

1) Saddles with 1-inch taps on ductile iron pipe shall be stainless steel double strap with stainless allow nuts. Supply with I.P. taps.

2) Saddle shall be Romac 202 N.

e. Tapping sleeve (used for fire service, leak repair and fire hydrant connections not requiring a cut in tee)

1) Shall be stainless steel, ss316 Clow No. F-5205.

f. Foster adaptors are recommended for mechanical joint connections at tees and valves.

g. Pipe Supports per detail 4.54. Hot dipped galvanized adjustable supports by Pipeline Products.

h. Toning Wire and Tape

i. Toning wire shall be No. 12 AWG, solid copper with Blue-colored insulation.

ii. Underground Warning Tape shall be 6-inch wide, APWA Standards Blue color, reading "CAUTION – WATERLINE BURIED BELOW".

iii. Install toning wire on all water main and service installations.

iv. Workmanship

1) Wire and tape shall be buried the entire length of trench and placed above pipe per standard trench detail drawing, approximately 6 inches above top of installed pipe. Lay flat and untwisted.

2) Wire shall be brought to the surface and connected at each valve box frame/lid. Distance between tracer lead access locations shall not be more than 1,000 feet. Joints or splices in wire shall be waterproof. If greater than 1,000 feet, a toning wire box is required per Detail 4.51.

3) Wire shall be laid above each water service lateral and brought to the surface at each service meter.

4. Water Main Shutdowns

a. Procedure: Contractor to provide City 48 hours notice for water main shutdown. City will notify all effected properties in the time frame and prior to shut down.

i. Prior to City shutting down and draining the water main, Contractor shall:

1) Pothole as necessary to determine depths, utility conflicts and ODs.

2) Must demonstrate to the City that all parts are on hands and adequate staffing is available for the tie in prior to shut down.

b. Penalty: If Contractor fails to comply with shut down as scheduled, the Contractor will be liable for all expenses incurred in time and materials for City staff to repeat the shut down. This will include staff time and water loss.

5. Testing

a. Disinfection

i. Prior to connecting new water mains and appurtenances to the active water system (including installation of valve clusters, fire hydrants, and service saddles/corporation stops), disinfection shall be completed to the satisfaction of the City in compliance with Oregon Health Authority OAR Chapter 333-61-050, including passing the bacteriological test. The contractor shall tie into the water system as soon as reasonably possible, but not more than 72 hours after the bacteriological test has been passed.

ii. The contractor shall use the Continuous–Feed Method for disinfecting water mains. This section references AWWA C651–86.

iii. The contractor shall use liquid chlorine or sodium hypochlorite or calcium hypochlorite in the disinfection operations.

1) Liquid chlorine contains 100% available chlorine and is packaged in steel containers usually of 100–pound, 150–pound or 1–ton net chlorine weight. Liquid chlorine shall be used only (1) in combination with appropriate gas–flow chlorinators and ejectors to provide a controlled high–concentration solution feed to the water to be chlorinated; (2) under the direct supervision of a person who is familiar with the physiological, chemical, and physical properties

of liquid chlorine, and who is trained and equipped to handle any emergency that may arise; and (3) when appropriate safety practices are observed to protect working personnel and the public.

2) Sodium hypochlorite or calcium hypochlorite is available in liquid form in glass, rubber–lined, or plastic containers typically ranging in size from 1 quart to 5 gallons; containers of 30 gallons or larger sizes may be available in some areas. Sodium Hypochlorite contains approximately 5% to 15% available chlorine, but care must be used in control of conditions and length of storage to minimize its deterioration.

iv. Water from the existing distribution system shall be made to flow at a constant, measured rate (measured by City water meter) into the newly laid water main.

v. At a point not more than 10 feet downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine. To assure that this concentration is provided, the contractor shall use Table 4.5, which gives the amount of chlorine required for each 100 feet of pipe of various diameters. Solutions of 1% chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires one pound of calcium hypochlorite in 8 gallons of water.

TABLE 4.5
Chlorine Required to Produce 25–mg/L Concentration in 100 feet of Pipe (by diameter)

Pipe Diameter (inches)	100% Chlorine (pounds)	1% Chlorine Solution (gallons)
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60

b. During the application of chlorine, no part of the main being tested shall be connected to existing valves. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances.

At the end of this 24-hour period, the treated water in all portions of the main shall have a residual of not less than 10 mg/L free chlorine.

Direct feed chlorinators, which operate solely from gas pressure in the chlorine cylinder, shall not be used for application of liquid chlorine. The preferred equipment for applying liquid chlorine is a solution–feed, vacuum–operated chlorinator and a booster pump. The vacuum–operated chlorinator mixes the chlorine in solution water; the booster pump injects the chlorine solution into the main to be disinfected. Sodium Hypochlorite solutions may be applied to the water main with a gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions.

When the 24–hour contact time has elapsed, the main shall be flushed until the chlorine, as measured by a comparator in the discharge of the pipe, is 1.5 PPM or less. Adequate precaution shall be taken during flushing of the main to preclude property damage or saturation of the surrounding material.

Upon completion of flushing, a sample of the discharge shall be collected in a bacteriological test bottle for testing by the City. The contractor shall comply with the County Health Department requirements for conducting the test. The City, upon notification by the contractor, shall arrange for the taking of the sample and shall notify the contractor of the results as soon as they are available.

If the test fails (results are positive), the main must be disinfected, flushed, and sampled again. Such operations must be repeated until results are negative.

Full compensation for disinfection shall be considered as incidental to the project and no separate payment shall be made. All costs related to disinfection shall be included in the various other applicable items of work.

5. Potable Water Main and Sewer Force Main Testing

   a. General

      i. Pressure Testing Pipeline shall take place after water main disinfection and bacteriological testing, and shall be conducted per these specifications.

      ii. Full compensation for pressure testing the pipeline shall be considered as incidental to the project and no separate payment shall be made. All costs related to pressure testing the pipeline shall be included in the various other applicable items of work.

   b. Procedure

      i. The water pressure test, or leakage test, shall establish that the section of line to be tested, including all joints, fittings and other appurtenances, will not leak within the limits of the applicable leakage allowance.

ii. The contractor shall provide all necessary apparatus for testing. A double check valve assembly meeting the requirements of the Oregon Health Authority shall be used at all times. All necessary taps on the main for testing purposes shall be provided and installed by the contractor at locations designated by the City.

iii. All service saddles, corporation stops, fire hydrants, fire lines, blow–offs, air vacuum valves and appurtenances are to be installed on the main pipeline prior to testing. Tie–ins shall be observed by the City at operating pressure prior to backfill.

iv. The contractor shall apply a pressure of 50 percent above normal operating pressure for all tests. This pressure shall be maintained as constant as possible throughout the period of test. All additional water pumped in during the testing period shall be measured and recorded. The contractor shall provide and use an air relief valve so air trapped in the line during test will not affect test results.

v. After test pressure is reached, contractor shall use a calibrated water container and record the quantity of water installed to maintain the test pressure. Compare with the following equation results or for longer pipelines, or if the same parameters, compare with the following leakage chart.

vi. The test duration shall be two hours, and the allowable leakage shall be determined by the formula:

$$L = \frac{ND\sqrt{P}}{7400}$$

where:
L = allowable leakage (gallons per hour)
N = number of joints in the length of pipeline tested
D = nominal diameter of the pipe (inches)
P = average test pressure during the test (pounds per square inch gauge)

Leakage values determined by the above formula are shown in the following table:

Table 4.5 Leakage Allowable
(Gallons per 1,000 feet per hour; 1,000 feet = 50 joints)

Pipe Size (Inches)	Test Pressure (psi)				
	50	100	150	200	250
4	0.19	0.37	0.33	0.38	0.43
6	0.29	0.41	0.50	0.57	0.64
8	0.38	0.54	0.66	0.76	0.85
10	0.48	0.68	0.83	0.96	1.07
12	0.57	0.81	0.99	1.15	1.28

Should the test of the pipe installed disclose leakage in excess of the specified allowable, the contractor shall, at the contractor's expense, locate and repair the defective joints until the leakage is within the specified allowance.

6. PIG flush

a. "Pigging" is required for all water mains 6-inch diameter and greater. Pigging is to be accomplished prior to hydrostatic testing and disinfection. Material for "pigs" shall be polyurethane foam as manufactured by Knapp Polly Pig, Inc. If other than commercial pigs are used, the size and shape of pigs shall be determined by City.

b. A minimum of three (3) pigs shall be flushed through the waterline. The contractor has the option of running all three (3) pigs at the same time or running the pigs one at a time. If all three (3) pigs are run at the same time, the pigs shall be identified individually.

c. Contractor shall provide erosion control as required to prevent damage to existing vegetation/ground.

d. Contractor shall be responsible for flushing "pigs" through waterlines and retrieving "pigs" after operation. If one or more pigs fails to run complete length of waterline, contractor shall be responsible for retrieving pigs and repeating the pigging operation.

e. If after pigging and disinfection, the bacteriological test fails, the contractor shall re-pig the waterline.

f. The contractor shall notify the City a minimum of 24 hours prior to pigging the waterlines and review erosion control methods for City's approval. City can require waterlines to be 're-pigged' if excessive foreign material is encountered during 'pigging'.

g. The contractor will be required to temporarily remove and replace the necessary pipe and fittings as required to place and remove "pigs" for flushing.

h. All waterlines that are not "pigged" shall be flushed through an opening at least six (6) inches in diameter.

i. The contractor shall provide all fittings and pipe necessary to perform the flushing.

j. The contractor may use water provided by the City to perform the pigging and flushing.

k. The contractor shall provide erosion protection where necessary.

END OF DIVISION

Chapter 18.25
Division 5
Site Work

18.25.001 DEFINITIONS

A. This section contains specification information on right of way improvements, usually above ground or related to surface features and site specific standards.

18.25.002 FORMWORK

A. General

1. Formwork described herein includes falsework and is temporary or permanent molds into which concrete is poured.

2. Shall conform to ACI-347 "Standards Recommended Practice for Concrete Formwork," current edition.

B. Materials

1. Plywood shall be APA approved as required to support concrete at rate of placement.

2. Steel forms may be used.

3. All wood used shall be suitable for construction, free of major defects and warps.

4. Manufacturers' assemblies may be used as forms provided that maximum loadings and deflections used on jacks, brackets, columns, joists and other manufacturer's devices do not exceed the manufacturer's recommendations.

5. Include all items devices necessary for proper placement, spacing, supporting and reinforcing steel in place for City approval.

6. Form Ties

a. Bolts, rods or other approved devices shall be used for internal form ties and shall be of sufficient quantities to prevent spreading of the forms.

b. Ties shall be placed 1 inch away from the top finished surface of the concrete.

c. The use of ties consisting of twisted wire loops will not be permitted.

d. Bolts and rods that are to be completely withdrawn shall be coated with grease.

e. Ties application shall be as recommended by the manufacturer for conditions of installation.

C. Workmanship

1. Shall resist spreading, shifting, settling and deflection no greater than 1/8 inch between supports after concrete placement. Forms to be tight and well braced.

2. Site shall be secured to protect the public from injury.

3. Do not remove formwork until concrete has hardened and attained sufficient strength to permit safe removal and adequate support of inherent and imposed loads. Protect from vandalism.

18.25.003 REINFORCED STEEL

A. Submittals

1. Shop drawings to include; bending and placing diagrams by supplier and in accordance with ACI publication 315-65, product description and coating, sample, certificates of compliance and Mill Test results.

B. Product Delivery, Storage and Handling

1. Store in manner as to prevent excessive rusting and fouling with grease, dirt, or other bond weakening coatings.

C. Materials

1. Reinforcing bars shall be clean billet steel, ASTM A615, Grade 60. Reinforcing steel shall be cleaned of mill dust, dried concrete, or other coatings that may reduce bond. When concrete placement is delayed, reinforcement shall be cleaned or replaced.

2. Tie wires shall be ASTM A-82-66.

3. Welded wire fabric shall be ASTM A-185-72.

D. Workmanship

1. Shop fabricate and cold-bend as detailed on reviewed shop drawings.

2. Conform to requirements as ACI 316-65 and ACI 301-66 Section 504, or current edition, where specific details are not shown on drawings or specifications.

3. Ensure placement will permit concrete protection in conformance with ACI 318-63, Section 308, or current edition, or to extent shown.

4. Support and fasten bars securely with concrete blocks, spacers, chairs or ties. Wire-tie bar intersections, secure bars at intervals not exceeding 80 x diameter of bar for horizontal bars and 192 x diameter of bar for vertical bars.

5. Rebar to be installed to avoid conflicts with conduits.

6. Splices and laps in conformance with ACI 318-63, Section 805 or current edition.

7. Safety- secure plastic caps on ends of exposed rebar. Contractor shall adhere to OSHA requirements for impalement protection.

E. City testing and inspection in accordance with current building code.

18.25.004 CAST IN PLACE CONCRETE

A. General

1. Contractor must receive prior approval from the City for the concrete mix design.

2. Truck mix and ready mix shall exceed ASTM C387, 4,000 psi at 28 days and shall be a high strength concrete mix.

3. Concrete shall have a 5-inch maximum slump when tested in accordance with ASTM C 143.

4. Cement shall be 5½ sacks per cubic yard of concrete, as a guideline.

5. Admixtures or accelerators will be considered on a case by case basis.

B. Workmanship

1. The concrete shall be placed in a maximum elapsed time of 1½ hours after the mixing water and cement has entered the drum until completion of discharge.

2. Use of ready mix concrete shall not be in progress or continued when a descending air temperature in the shade and away from artificial heat falls below 40 degrees Fahrenheit.

3. Provide a smooth finish. Protect concrete from damage during the first 7-day curing time.

4. Compaction. The contractor shall compact the concrete by means of vibration. The contractor shall operate the equipment in such a manner that a satisfactory compaction of the concrete is produced. Finished surface to be within 1/8" tolerance of planned grade.

C. Sidewalks – Refer to Standard Detail 5.13

1. Subgrade – please refer to Division 3, 18.15.002 herein.

2. Mix shall be as stated in 18.25.004 herein.

3. Thickness – 4-inches.

4. Control Joints – as specified in Standard Detail 5.13.

5. Workmanship

a. Broom finish, smooth even surface with 2% cross fall. Defects may require replacement of panel.

b. As specified in 18.25.004 herein.

c. Contraction joints shall be installed every 5 feet and aligned with adjacent curb contraction joints.

D. Curb and Gutter – Standard Detail 5.10.

1. Curb and gutter section must be integrally placed as a monolithic unit.

2. Curb and gutter shall have contraction joints in 5-foot intervals. Align contraction joints with adjacent sidewalk contraction joints where possible. Install per Subsection F and Standard Details herein.

E. Driveway Approach

1. Subgrade - please refer to Division 3, 18.15.002 herein.

2. Mix shall be as stated in 18.25.004 herein.

3. Thickness – 6 inches.

4. Contraction joints - as specified in Standard Detail 5.13 and Subsection F herein.

F. Control joints

1. Install as shown on detail 5.13.

2. Expansion joints

a. Install where new sidewalk is poured adjacent to existing sidewalks

b. Bring joint material to within one (1) inch of top surface, fill remainder of joint material with standard sealing compound.

c. Expansion joint material shall be ½-inch thick preformed asphalt fiberboard conforming to ASTM D 994.

d. Install at interface of new and old curb.

3. Contraction joints

a. May be jig sawed or hand formed "bull nose" with round over tool deeper than parting tool to a joint depth to be a minimum of one-third the total depth of the section.

b. Install where sidewalks abut vertical surfaces. In sidewalks, contraction joints shall be installed at right angles.

c. Install at interface of straight curb and short radius section and both sides of driveway cut.

d. Install along curb and gutter at 15 foot intervals not to exceed 45 feet.

e. Align sidewalk joints at 5 foot intervals with curb and gutter joints at 15 foot intervals.

18.25.005 SIGNPOSTS

A. General - This item shall consist of the furnishing, fabricating, galvanizing and erecting of signposts in conformity with the lines, grades, dimensions and locations as directed or provided by the City of Brookings.

B. Materials

1. Posts shall be 2 inch x 2 inch square fit or Telespar posts (holes 4 sides) zinc-coated as manufactured by Traffic Safety Supply or approved equal.

2. Anchor section shall be 2¼ inch x 2¼ inch x 3 foot.

3. Base section of post consists of 2½ inch x 2½ inch x 18 inch long base sleeve.

4. All posts to be set in a minimum 3,000 psi concrete mix as shown in detail 5.20.

C. Workmanship

1. Posts shall be installed in accordance with the double 12-gauge installation that utilizes a two-piece breakaway anchor.

2. Posts shall be set in cylindrical foundations. For concrete foundation's hole shall be excavated for the bury depth of the post: not less than 12 inches in diameter.

3. Sign posts shall be erected plumb.

18.25.006 STREET SIGNS

A. General – All new signage must meet the minimum retroreflectivity requirements as identified by the MUTCD.

B. Retroreflectivity Requirements Summary

1. White copy on overhead guide signs must be made from prismatic sheeting.

2. White copy on ground mounted street name signs cannot be made from Type I sheeting.

3. Warning signs (black on yellow or orange) cannot be made from Type I sheeting.

4. Regulatory signs (black on white) must retain a minimum retroreflectivity level of ≥ 50 cd/lx/m^2 (while use of Type I sheeting—with an initial retroreflectivity value of 70 cd/lx/m^2—is allowed, sign life will be short and may result in poor life cycle value).

5. Stop signs (white on red) have a minimum contrast ratio of ≥ 3:1 (white reflectivity ÷ red reflectivity).

18.25.007 STREET LIGHTS

A. General – Street lights shall be provided for all developments within the City.

B. Location

1. New Streets – As part of a new street development, street lighting shall be installed at intersections and at a maximum distance of 220 feet apart with the following exceptions:

a. A cul-de-sac where the terminus is less than 150 feet from the nearest lighted intersection; otherwise, a street light shall be installed at the end of the cul-de-sac.

b. For streets serving industrial areas, there shall be a minimum of one (1) street light at each intersection.

2. Existing Streets – Developments having 200 feet or more of frontage on an existing street shall install a minimum of one (1) street light for the first 200 feet, plus one (1) street light per 220 feet of additional frontage. A development with less than 200 feet of frontage on an existing street shall enter into a deferred improvement agreement for future street light installation.

3. As determined by Site Plan Committee or traffic engineering designee to prevent a hazardous driving condition.

4. Alternative Standards - Residential homeowner's associations may propose alternative lighting standards under the following conditions; the proposed lighting configuration and specifications are stamped by a registered civil engineer, and the homeowners association shall take full responsibility for maintenance and powering of the street lights through recordation of covenants, codes and restrictions (CC&Rs). The City Attorney shall review and approve the CC&Rs. The homeowners association must be formed and in accordance with Oregon law and shall hold the City harmless from damage claims arising from negligence on the part of the homeowners association in regards to luminance, maintenance and supplying power.

C. Types

1. Chetco Avenue and Downtown Decorative Light, 14' pole. Color F283 green finish distributed by Platt, Beaverton Oregon.

2. "Tear Drop" Decorative Lights, 30' pole. Light fixture by Phillips Lumec.

3. Standard Luminare Light, 30' pole. Manufactured by Shakespeare, part #BH-30-16-N5-BG-20 (pole and base), #OPAR-6-BZ (arm), #OPHW-1-BZ (hardware) and per standard detail 5.30 herein.

D. Service – Nearest facility carrying 120 volts secondary and controlled by individual photoelectric control devices. All services shall be underground.

18.25.008 TREE TRIMMING AND REMOVAL

A. General. Any tree trimming work that involves the public right of way, including staging, shall be required to obtain a Public Works permit and shall comply with all general conditions contained herein.

18.25.009 RESERVED

189.25.010 RESERVOIR AND PUMP STATION FACILITIES

A. Paint and Colors

1. Roof is weathered wood.

2. Forest Green for Reservoirs and Pump Stations.

18.25.011 PARKS AND RECREATION FACILITIES - RESERVED

END OF DIVISION

Standard Construction Details
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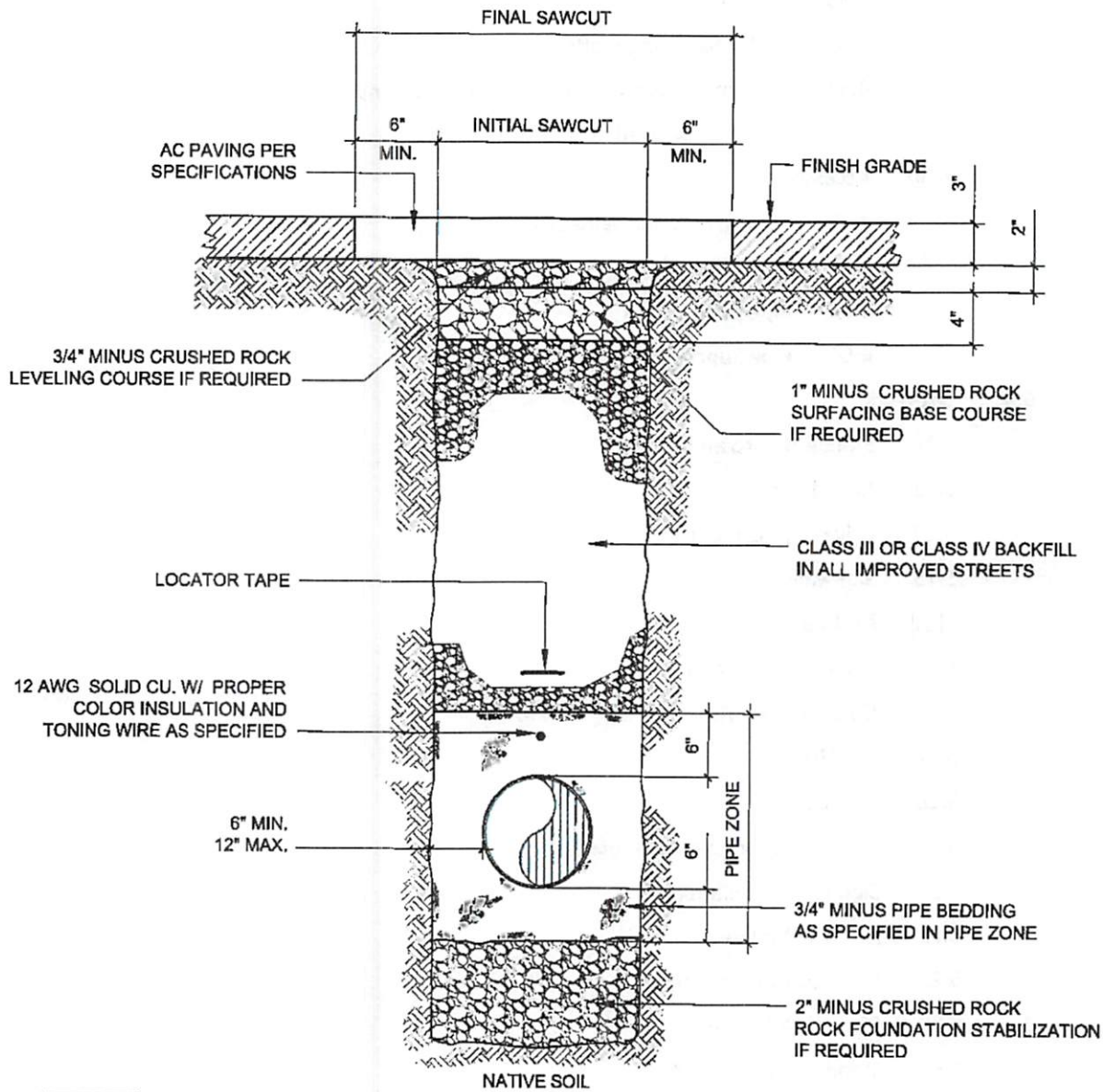
5.34 Cluster Mailbox

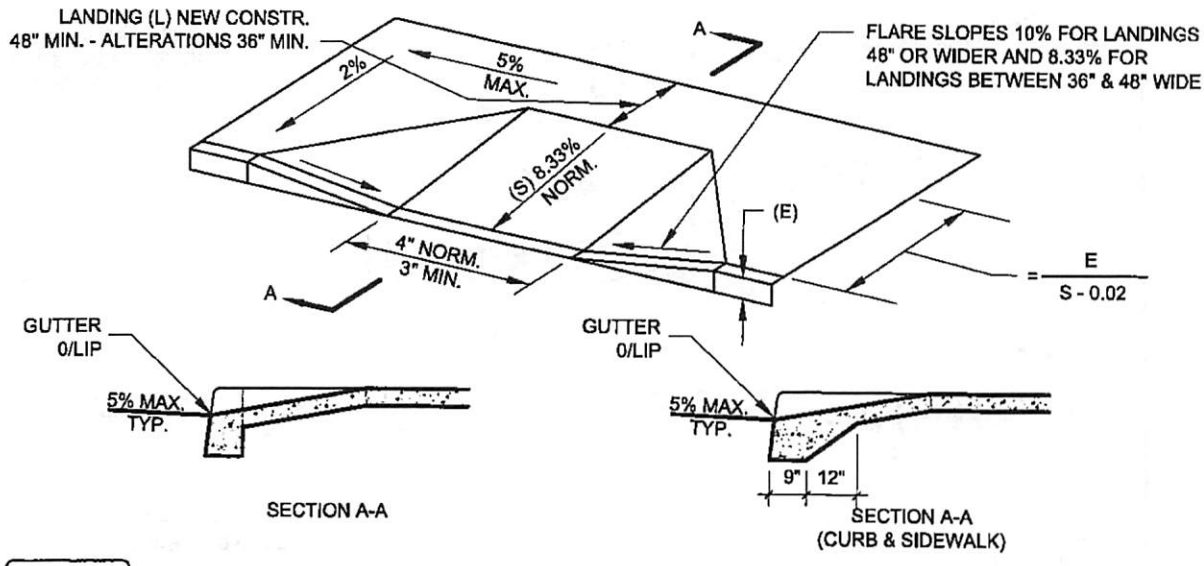
5.35 Single Mailbox

T. PATCH



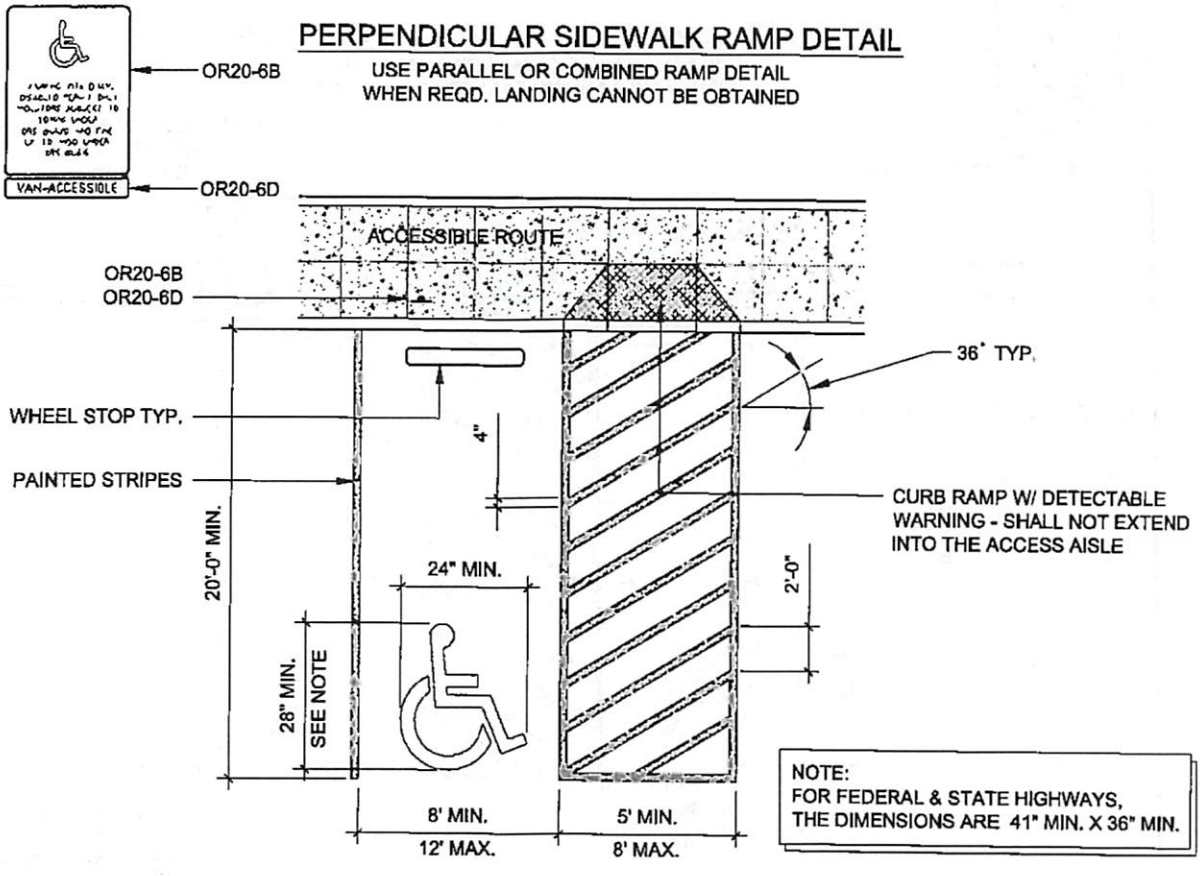
NOTE:
TRENCH LINES LOCATED OUTSIDE IMPROVED (PAVED) ROADWAY WILL BACKFILL WITH NATIVE MATERIAL TO MATCH EXISTING GRADE

	CITY OF BROOKINGS - STANDARD DETAIL	3.10
	TYPICAL TRENCH DETAIL	
	DATE: _____	



PERPENDICULAR SIDEWALK RAMP DETAIL

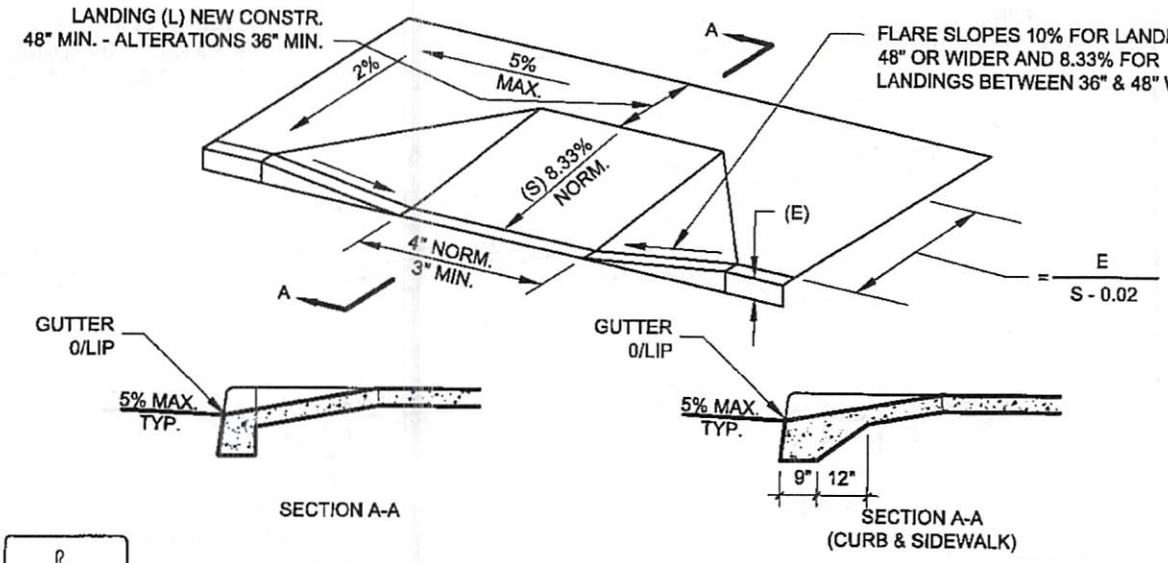
USE PARALLEL OR COMBINED RAMP DETAIL
WHEN REQD. LANDING CANNOT BE OBTAINED

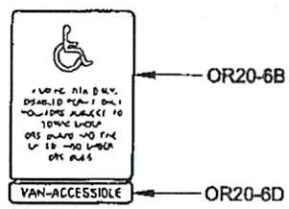


WHITE STRIPING AND PAVEMENT STENCIL REQUIRED

STROKE WIDTH ON SYMBOL IS 3" MINIMUM
BLUE BACKGROUND AND BLUE PAINTED CURB OPTIONAL

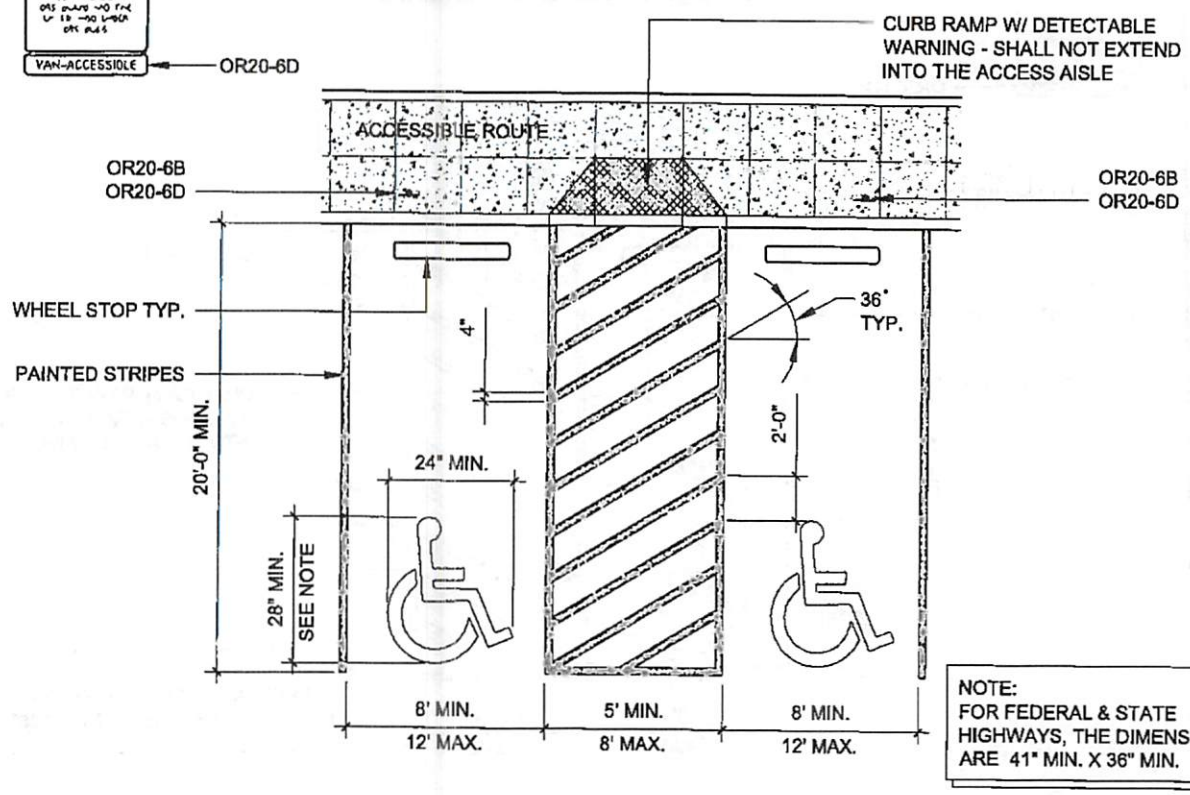
	CITY OF BROOKINGS - STANDARD DETAIL	
	ADA SINGLE PARKING SPACE	3.15
	DATE: _____	





PERPENDICULAR SIDEWALK RAMP DETAIL

USE PARALLEL OR COMBINED RAMP DETAIL
WHEN REQD. LANDING CANNOT BE OBTAINED

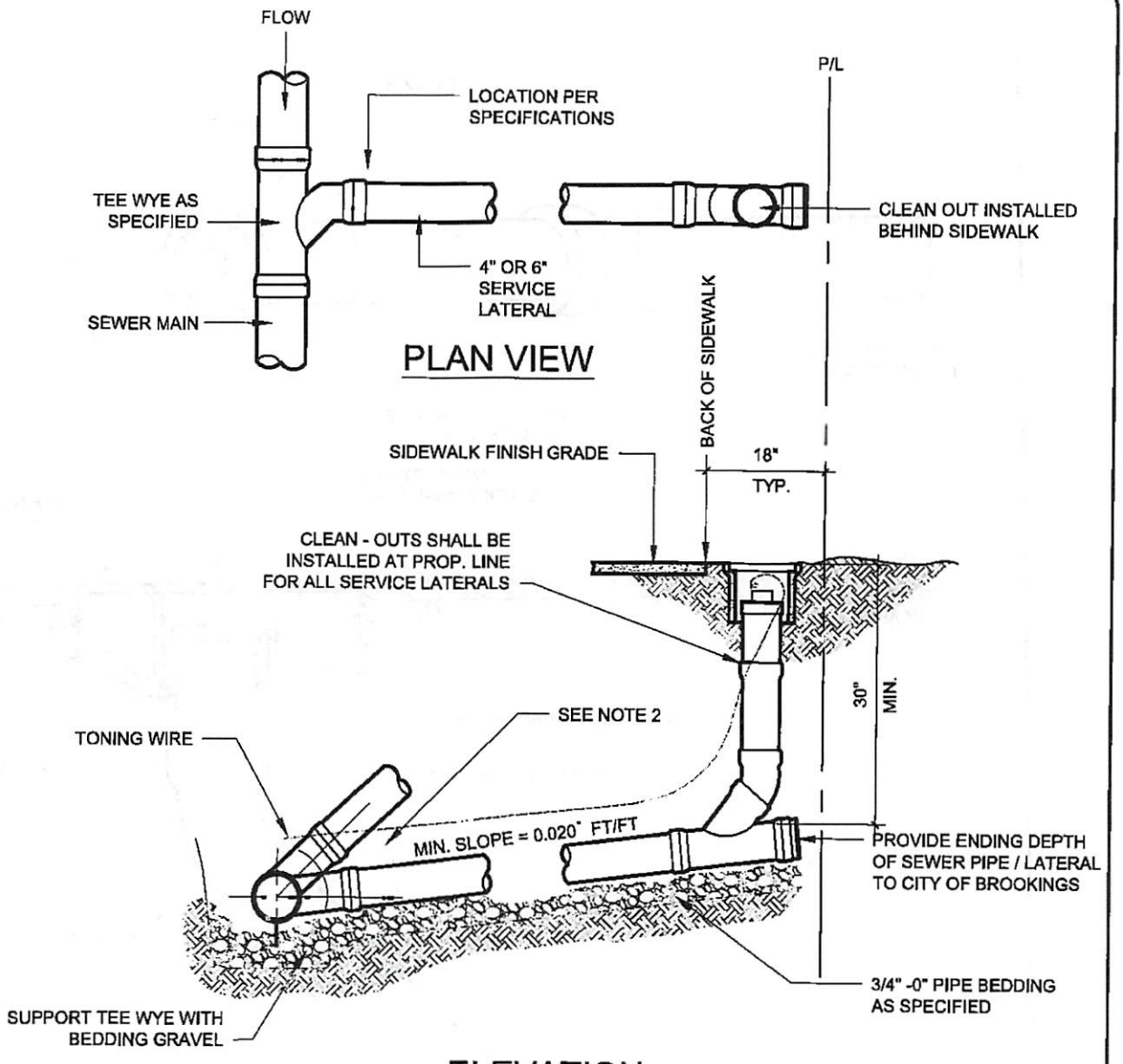


NOTE:
FOR FEDERAL & STATE HIGHWAYS, THE DIMENSIONS ARE 41" MIN. X 36" MIN.

WHITE STRIPING AND PAVEMENT STENCIL REQUIRED

STROKE WIDTH ON SYMBOL IS 3" MINIMUM
BLUE BACKGROUND AND BLUE PAINTED CURB OPTIONAL

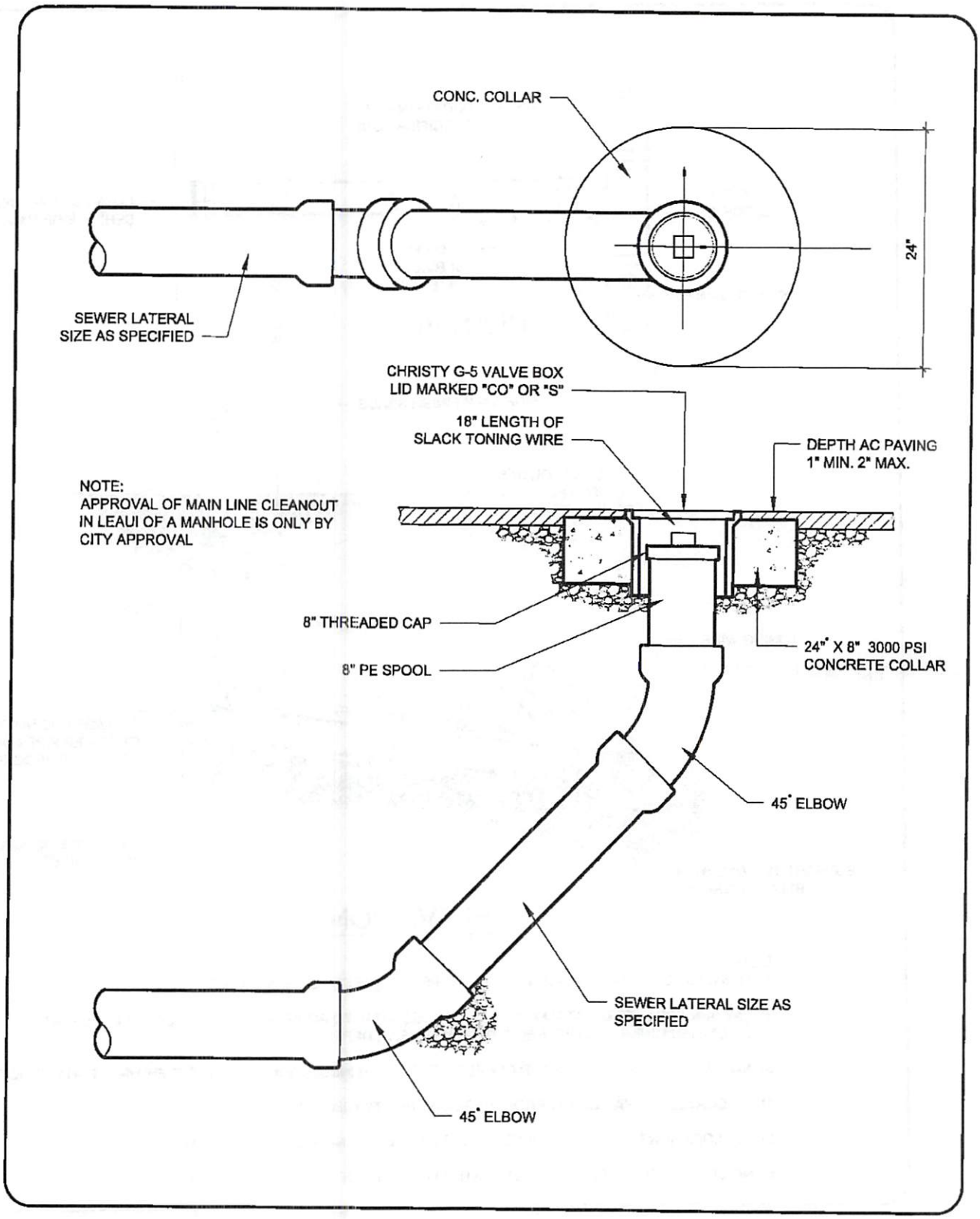
	CITY OF BROOKINGS - STANDARD DETAIL	
	ADA DOUBLE PARKING SPACE	3.16
	DATE: _____	



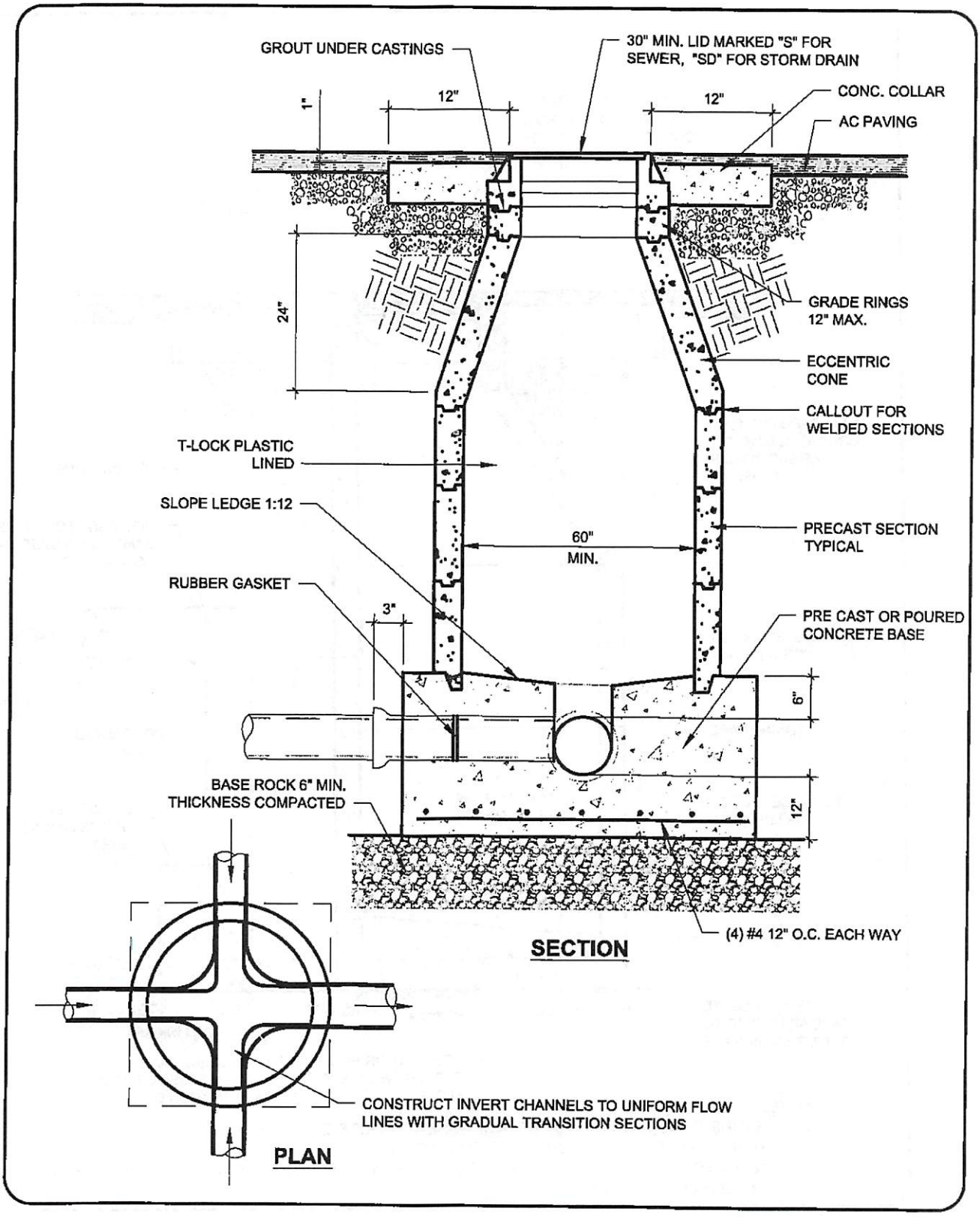
NOTES:

1) MINIMUM DEPTH AT RIGHT-OF-WAY OR PROPERTY LINE SHALL BE 30 INCHES
2) LAY SERVICE LATERAL AT MAX. 45° FROM HORIZONTAL TO ACHIEVE REQUIRED DEPTH AT PROPERTY LINE WHEN MINIMUM SLOPE RESULTS IN EXCESSIVE DEPTH.
3) NO. 12 AWG TONING WIRE SOLID COPPER WITH GREEN INSULATION WITH 18" TAG END IN CLEAN OUT BOX
4) IF LOCATED IN DRIVEWAY APPROACHES USE CHRISTY F08C LID
5) ALL LOCATIONS OF SERVICE LINES SHALL BE NOTED ON NEW CURB WITH A MARK "S".
6) NO CURB WEEP HOLES SHALL BE LOCATED WITHIN 18" OF THE CLEAN OUT BOX.

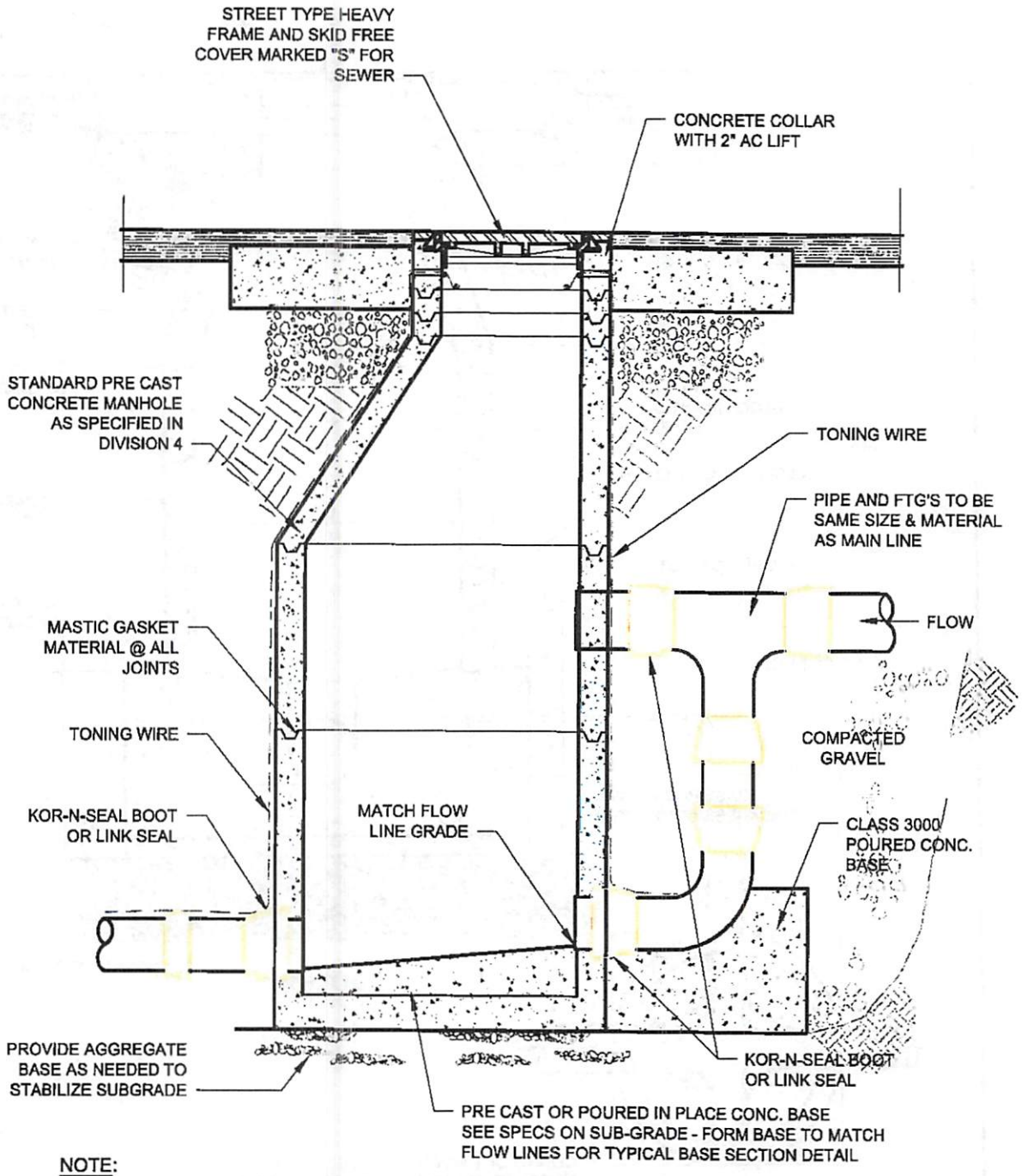
CITY OF BROOKINGS - STANDARD DETAIL	
SEWER SERVICE LATERAL	4.11
DATE: _____	



	CITY OF BROOKINGS - STANDARD DETAIL	
	MAINLINE CLEANOUT	4.12
	DATE: _____	



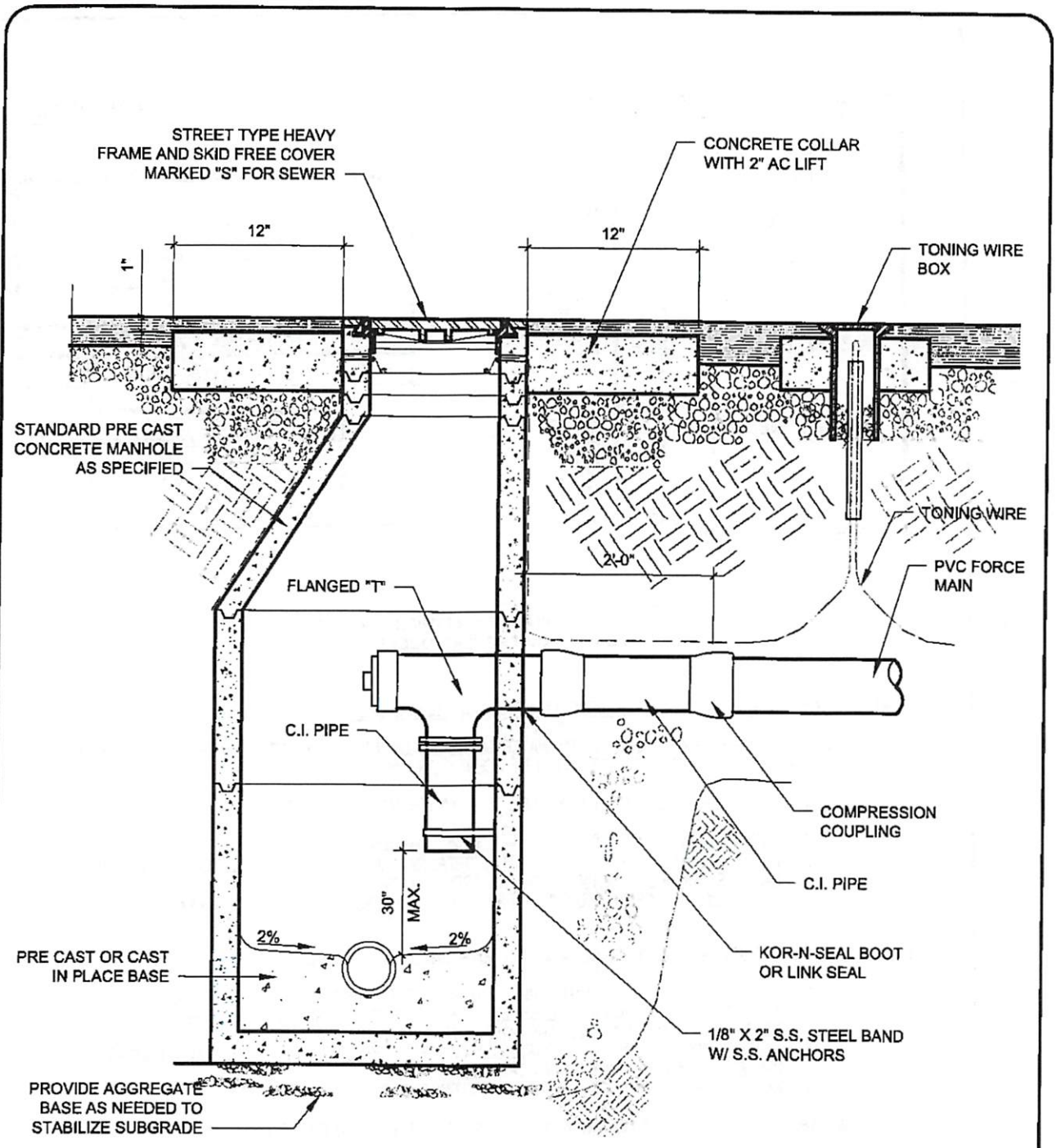
CITY OF BROOKINGS - STANDARD DETAIL	4.13
STANDARD MANHOLE - CONCENTRIC	
DATE: _____	



NOTE:

1. STUBS TO MANHOLE MUST BE "KOR-N-SEAL" BOOTS OR CORE DRILL W/LINKSEAL AND GROUTED WATERTIGHT.
2. NEED TO INSTALL GREEN CARSONITE STAKE WHEN MANHOLE IS OUTSIDE CITY RIGHT OF WAY IN VEGETATED AREA'S

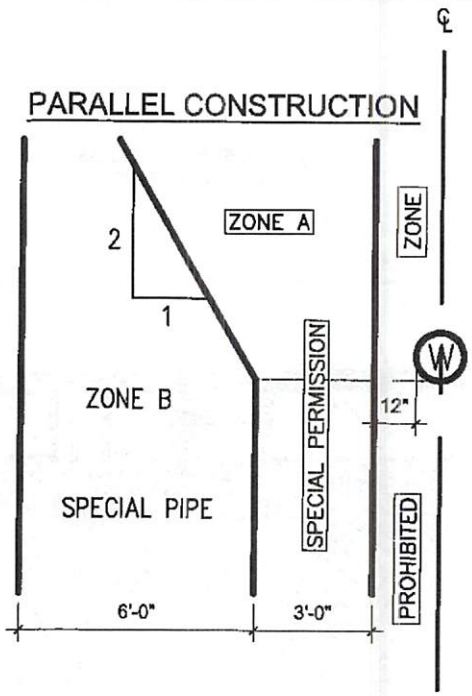
	CITY OF BROOKINGS - STANDARD DETAIL	
	OUTER DROP MANHOLE	4.14
	DATE: _____	

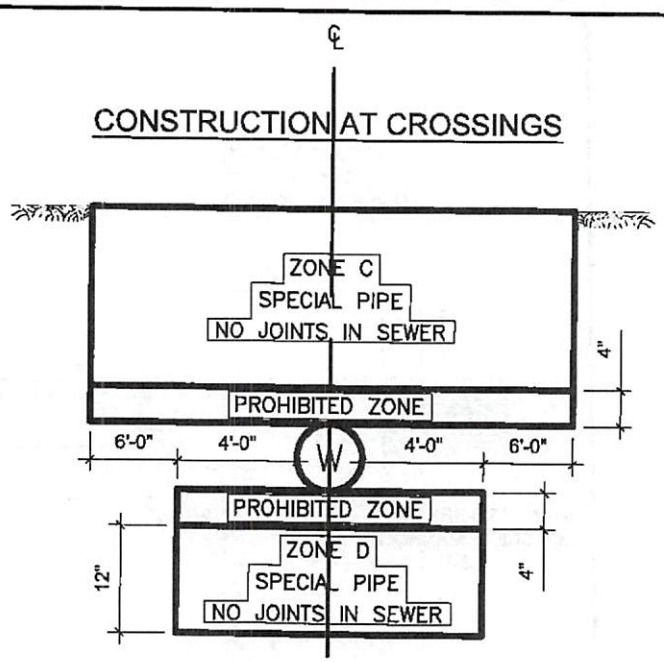


NOTE:

1. STUBS TO MANHOLE MUST BE "KOR-N-SEAL" BOOTS OR CORE DRILL W/LINKSEAL AND GROUTED WATERTIGHT.
2. NEED TO INSTALL GREEN CARSONITE STAKE WHEN MANHOLE IS OUTSIDE CITY RIGHT OF WAY IN VEGETATED AREA'S
3. FOR POURED IN PLACE BASE SEE 4.13

	CITY OF BROOKINGS - STANDARD DETAIL	
	INNER DROP MANHOLE	4.15
	DATE: _____	





NOTES:
1. ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE
2. ZONE "P" IS A PROHIBITED ZONE

ZONE — SPECIAL CONSTRUCTION REQUIRED FOR SANITARY SEWER LINE

A. SANITARY SEWER LINES PARALLEL TO WATER MAINS SHALL NOT BE PERMITTED IN THIS ZONE WITHOUT APPROVAL FROM THE RESPONSIBLE HEALTH AGENCY AND WATER SUPPLIER.

B. A SANITARY SEWER LINE PLACED PARALLEL TO A WATER MAIN SHALL BE CONSTRUCTED OF:

1. EXTRA STRENGTH VITRIFIED CLAY PIPE WITH COMPRESSION JOINTS.
2. PLASTIC SANITARY SEWER PIPE WITH RUBBER RING JOINTS (PER ASTM D3034) OR EQUIVALENT.
3. CAST OR DUCTILE IRON PIPE WITH COMPRESSION JOINTS.
4. REINFORCED CONCRETE PRESSURE PIPE WITH COMPRESSION JOINTS (PER AWWA C302-74).

C. A SANITARY SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:

1. DUCTILE IRON PIPE WITH HOT DIPPED BITUMINOUS COATING AND MECHANICAL JOINTS.
2. A CONTINUOUS SECTION OF CLASS 200 (DR14 PER AWWA C900) PLASTIC PIPE OR EQUIVALENT CENTERED OVER THE PIPE BEING CROSSED.
3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.
4. ANY SANITARY SEWER PIPE WITHIN A CONTINUOUS SLEEVE.

D. A SANITARY SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:

1. A CONTINUOUS SECTION OF DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
2. A CONTINUOUS SECTION OF CLASS 200 (DR14 PER AWWA C900) PLASTIC PIPE OR EQUIVALENT CENTERED OVER THE PIPE BEING CROSSED.
3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.
4. ANY SANITARY SEWER PIPE WITHIN A CONTINUOUS SLEEVE.
5. ANY SANITARY SEWER PIPE SEPARATED BY A TEN-FOOT, FOUR INCH THICK REINFORCED CONCRETE SLAB. CONTRACTOR TO PROVIDE DETAIL FOR APPROVAL BY CITY

	CITY OF BROOKINGS - STANDARD DETAIL	
	SANITARY SEPARATION - SEWER (CASE 1)	4.16
	DATE: _____	

NOTES:

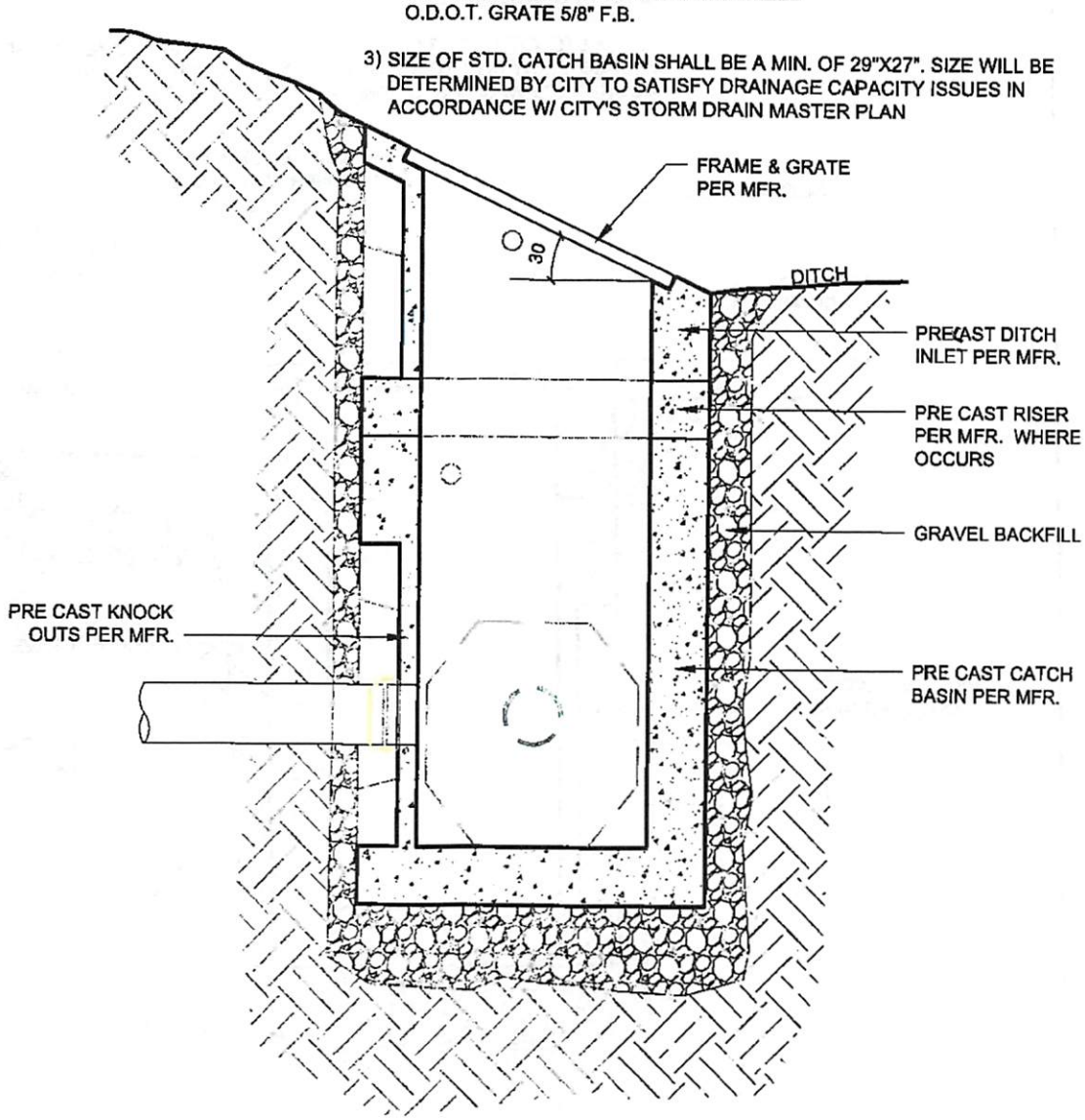
1) PREFABRICATED UNITS FROM ADVANTAGE PRE CAST OR APPROVED OTHER

ADVANTAGE PRE CAST
1302 CANDLEWOOD DR NORTH
KEIZER, OREGON 97303

2) CATCH BASIN, FRAME, AND GRATES SHALL MEET H20 LOADING. & BIKE FRIENDLY

DITCH INLET GRATE: 1/4" F.B.
C.O. SALEM GRATE: 1/4" F.B. GALVANIZED
O.D.O.T. GRATE 5/8" F.B.

3) SIZE OF STD. CATCH BASIN SHALL BE A MIN. OF 29"X27". SIZE WILL BE DETERMINED BY CITY TO SATISFY DRAINAGE CAPACITY ISSUES IN ACCORDANCE W/ CITY'S STORM DRAIN MASTER PLAN



SECTION

CITY OF BROOKINGS - STANDARD DETAIL		4.21
DITCH INLET		
	DATE: _____	

NOTES:

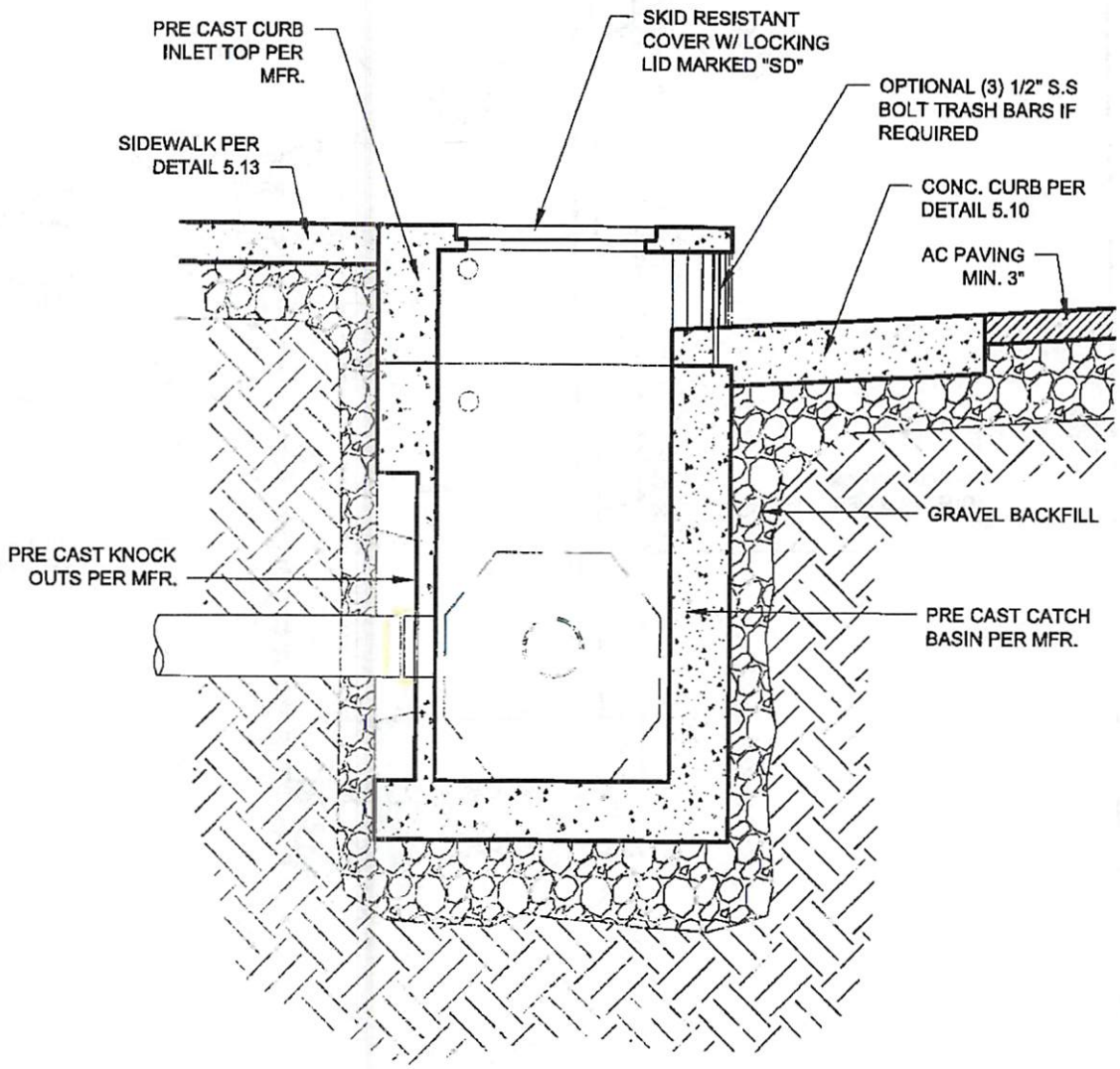
1) PREFABRICATED UNITS FROM ADVANTAGE PRE CAST OR APPROVED OTHER

ADVANTAGE PRE CAST
1302 CANDLEWOOD DR NORTH
KEIZER, OREGON 97303

2) CATCH BASIN, FRAME, AND GRATES SHALL MEET H20 LOADING.

DITCH INLET GRATE: 1/4" F.B.
C.O. SALEM GRATE: 1/4" F.B. GALVANIZED
O.D.O.T. GRATE 5/8" F.B.

3) SIZE OF STD. CATCH BASIN SHALL BE A MIN. OF 29"X27". SIZE WILL BE DETERMINED BY CITY TO SATISFY DRAINAGE CAPACITY ISSUES IN ACCORDANCE W/ CITY'S STORM DRAIN MASTER PLAN



SECTION

CITY OF BROOKINGS - STANDARD DETAIL	
CURB DRAIN INLET - TYPICAL	4.22
DATE: _____	

NOTES:

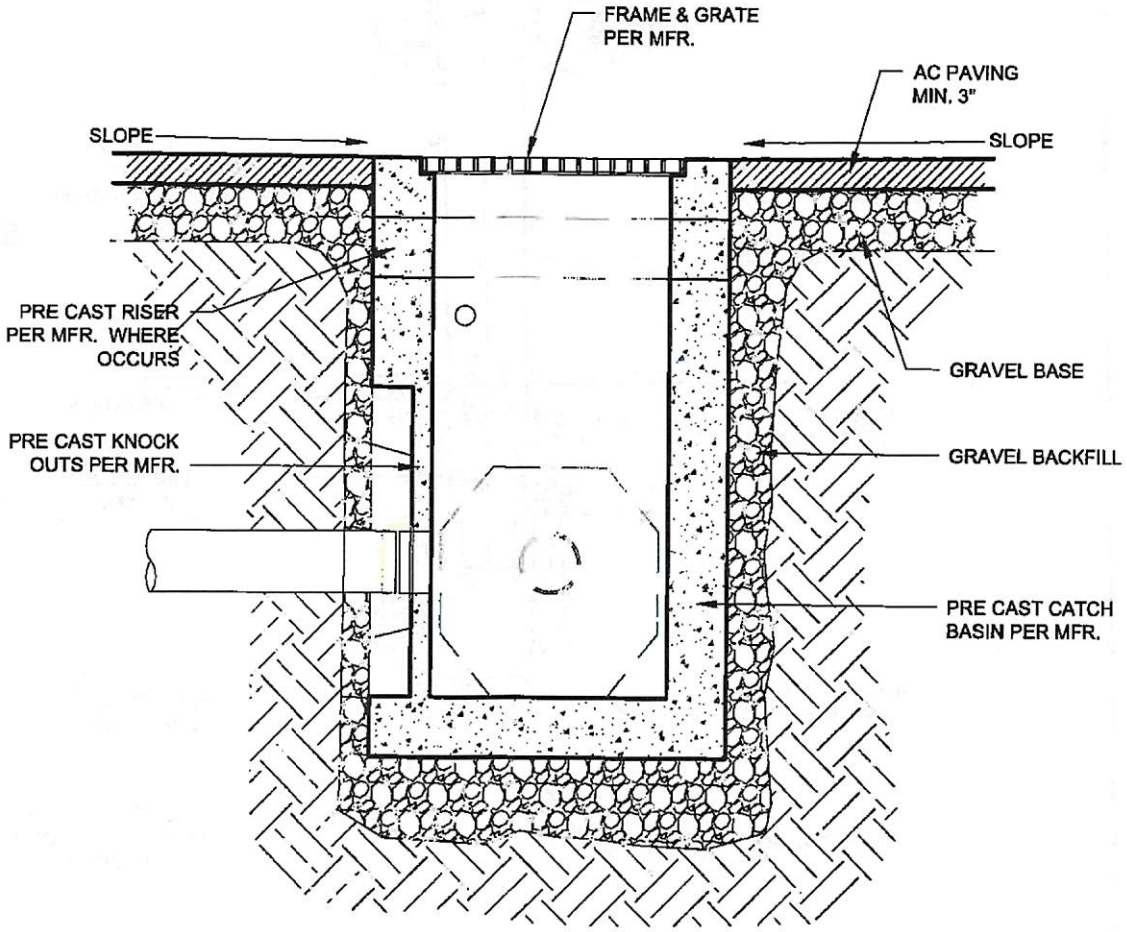
1) PREFABRICATED UNITS FROM ADVANTAGE PRE CAST OR APPROVED OTHER

ADVANTAGE PRE CAST
1302 CANDLEWOOD DR NORTH
KEIZER, OREGON 97303

2) CATCH BASIN, FRAME, AND GRATES SHALL MEET H20 LOADING. & BIKE FRIENDLY

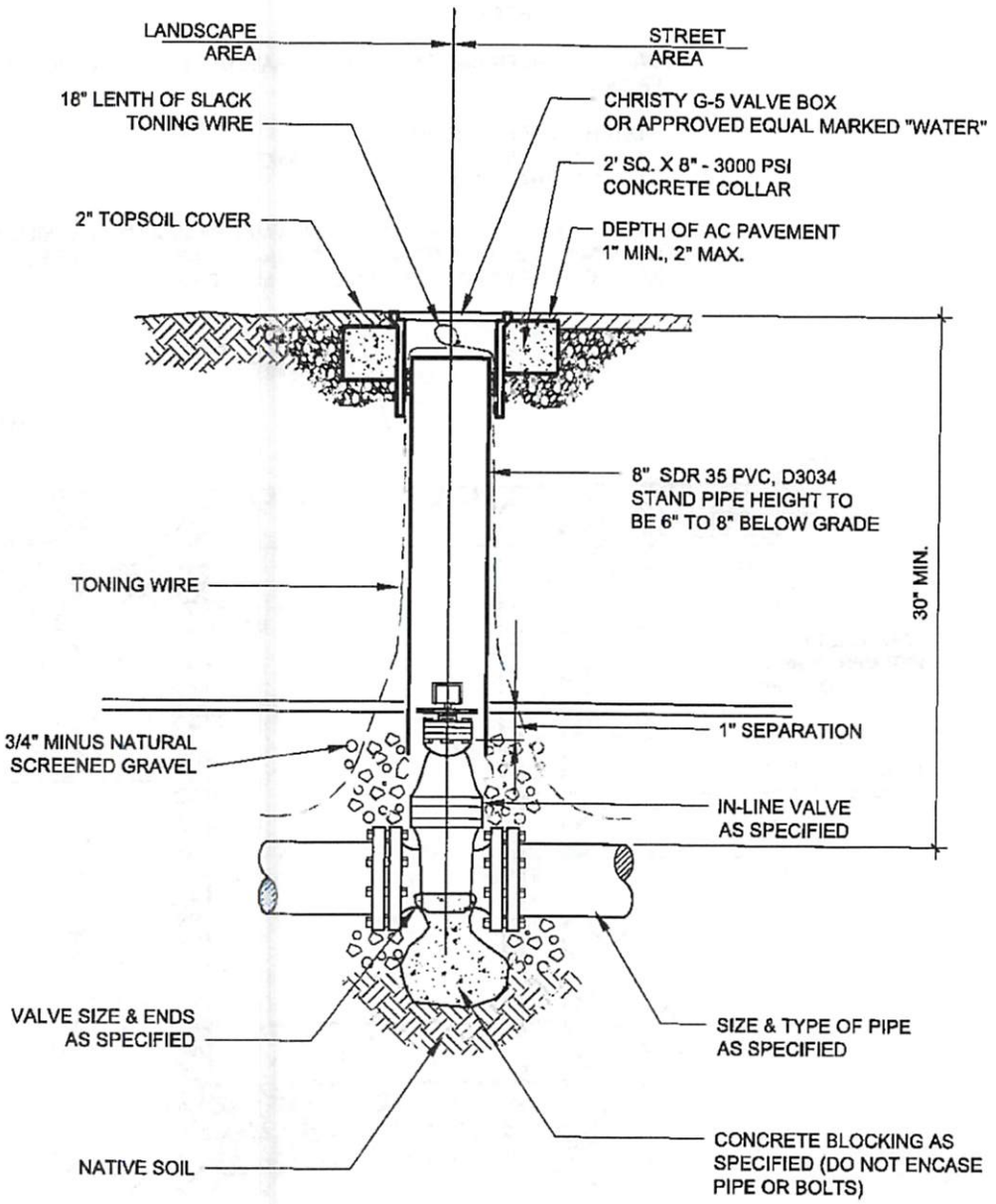
DITCH INLET GRATE: 1/4" F.B.
C.O. SALEM GRATE: 1/4" F.B. GALVANIZED
O.D.O.T. GRATE 5/8" F.B.

3) SIZE OF STD. CATCH BASIN SHALL BE A MIN. OF 29"X27". SIZE WILL BE DETERMINED BY CITY TO SATISFY DRAINAGE CAPACITY ISSUES IN ACCORDANCE W/ CITY'S STORM DRAIN MASTER PLAN



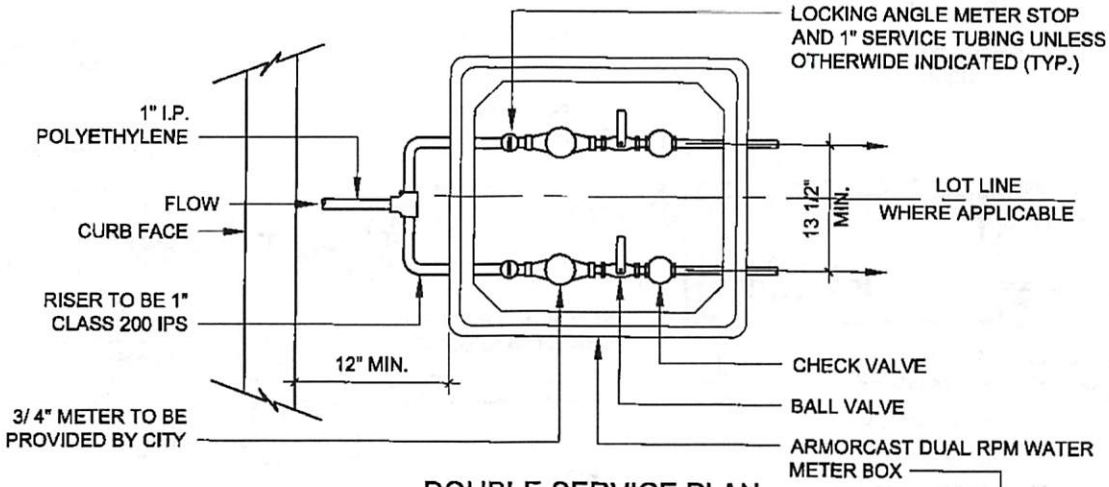
SECTION

CITY OF BROOKINGS - STANDARD DETAIL	
CATCH BASIN	4.23
DATE: _____	



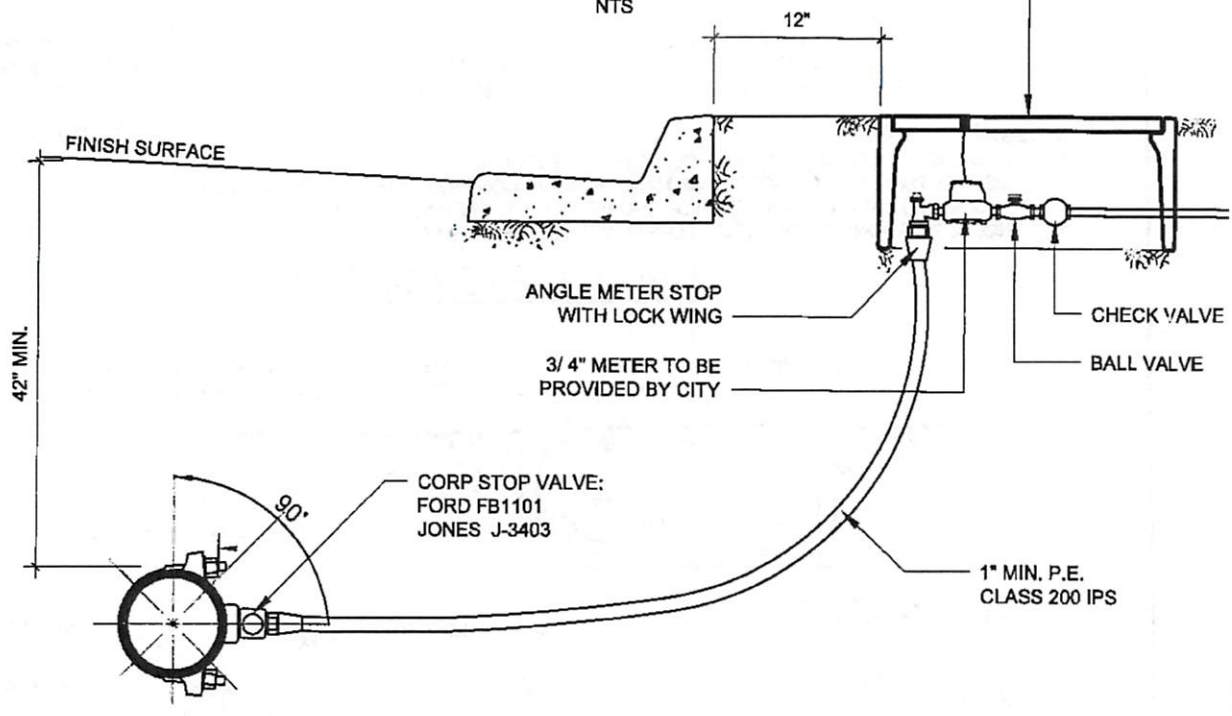
NOTE:
1. VALVE STEM EXTENSION NECESSARY IF GRADE TO TOP OF VALVE NUT IS GREATER THAN 3'-0".
2. MAY USE VC212 SELF CENTERING VALVE STAND PIPE SETTER FOR 8' SDR 3034.
3. BLUE CARSONITE STAKE REQUIRED WHEN VALVE IS OUTSIDE CITY RIGHT OF WAY IN VEGETATED AREA'S.

	CITY OF BROOKINGS - STANDARD DETAIL	
	TYPICAL POTABLE WATER VALVE BOX	4.31
	DATE: _____	



DOUBLE SERVICE PLAN

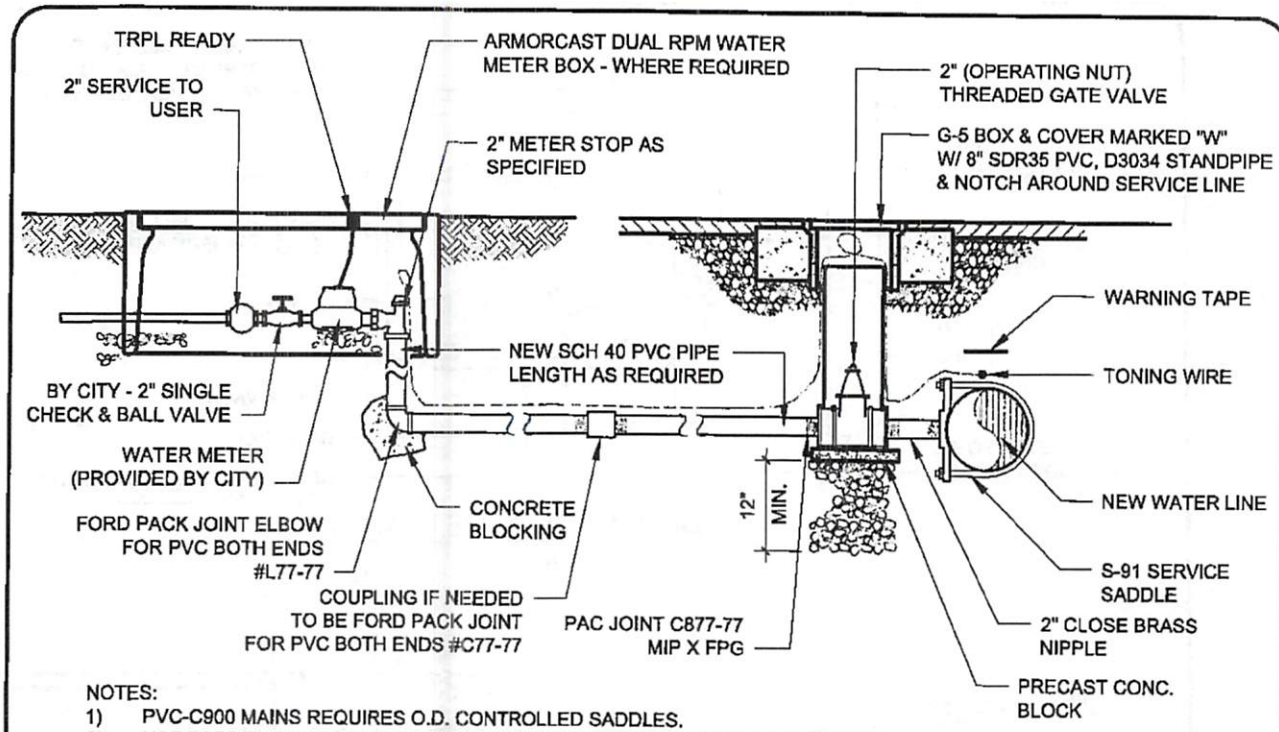
NTS



NOTES:

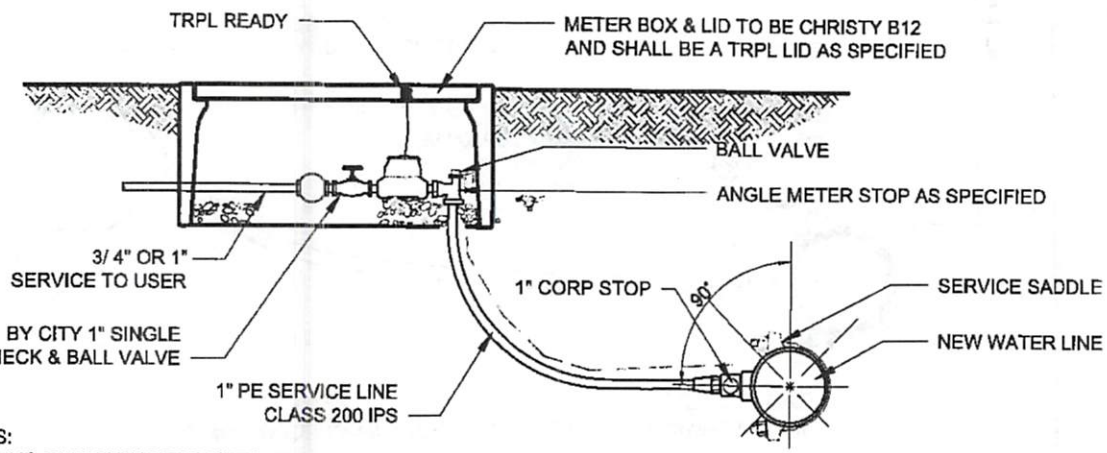
1. NEW SERVICES WILL NOT BE SPLICED WHEN DAMAGED, SERVICE WILL BE RENEWED.
2. SINGLE SERVICES ARE SIMILAR, UNLESS OTHERWISE INDICATED.
3. CITY APPROVED CROSS-CONNECTION CONTROL DEVICES REQUIRED ON ALL NEW AND RENEWED COMMERCIAL, INDUSTRIAL, IRRIGATION AND PARTICULAR RESIDENTIAL WATER SERVICES, REGARDLESS OF SIZE.
4. CONTRACTOR TO PROVIDE AND INSTALL #14 GA. COATED TRACER WIRE ON ALL P.E. SERVICES.
5. METER BOXES NOT TO BE INSTALLED IN DRIVEWAYS PER BROOKINGS MUNICIPAL CODE (BMC)

	CITY OF BROOKINGS - STANDARD DETAIL	
	1" or 3/4" METER MANIFOLD	4.32
	DATE: _____	



NOTES:
1) PVC-C900 MAINS REQUIRES O.D. CONTROLLED SADDLES.
2) USE FORD PACK JOINT COUPLINGS MALE I.P. X PVC COMPRESSION AT TAPPING VALVE PVC 90° BEND & ANGLE METER STOP. (NO PVC MALE OR FEMALE ADAPTERS)
3) NO. 12 AWG TONING WIRE SOLID COPPER WITH BLUE INSULATION.

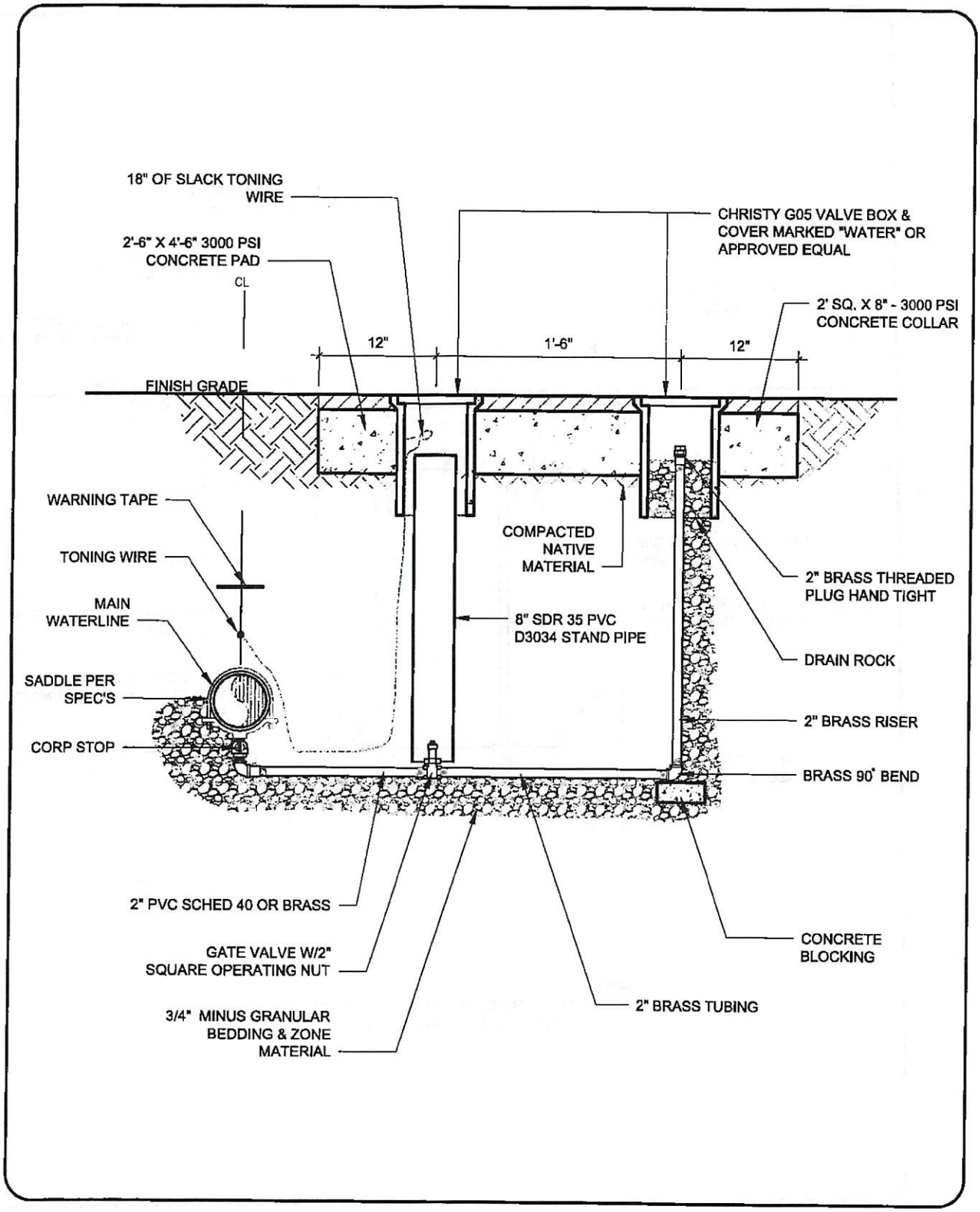
TYPICAL 2" WATER SERVICE



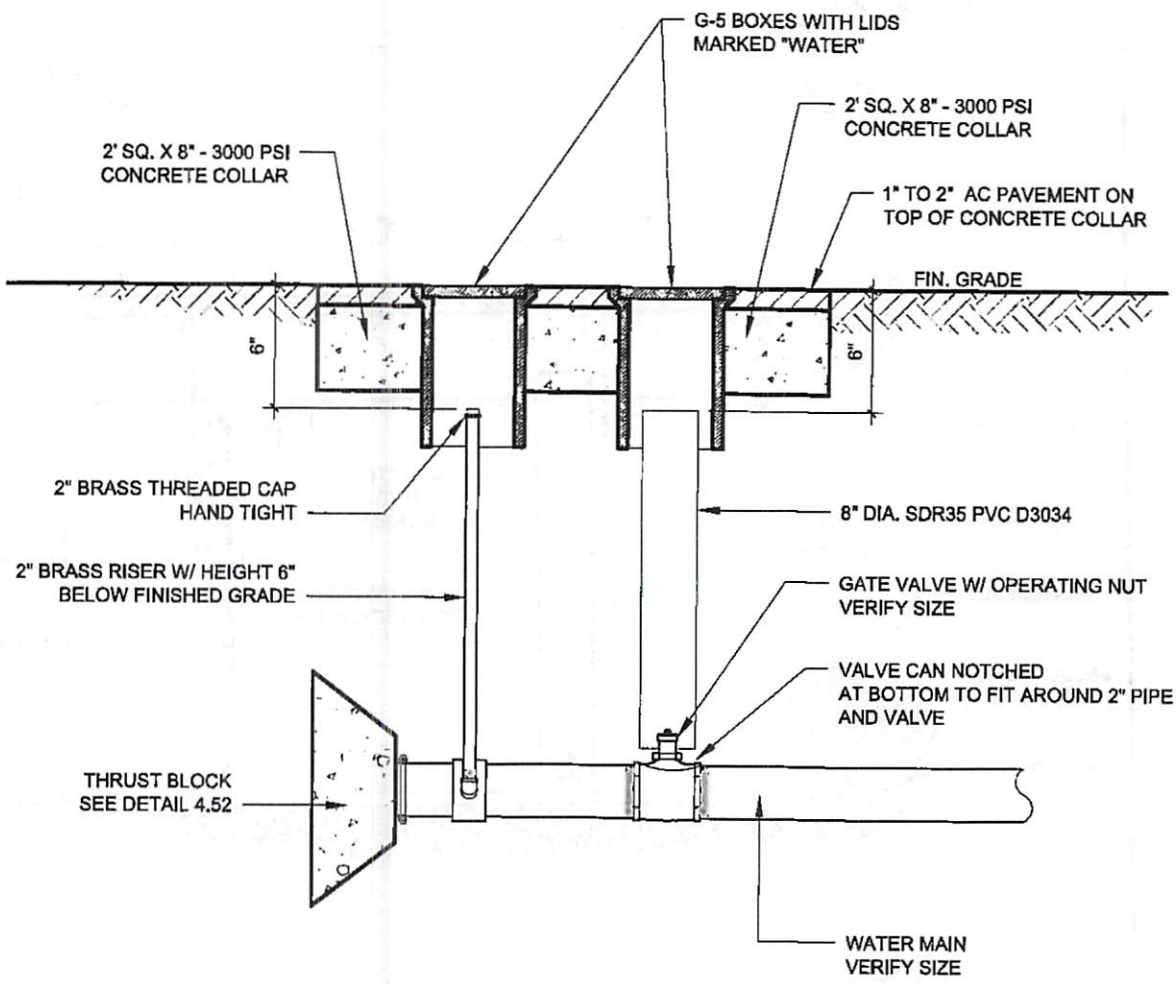
NOTES:
1) PVC-C900 MAINS REQUIRES O.D. CONTROLLED SADDLES.
2) USE FORD PACK JOINT COUPLINGS MALE I.P. X PE COMPRESSION AT TAPPING VALVE, AND AT CONNECTION TO ANGLE METER STOP. (NO PVC MALE OR FEMALE ADAPTERS)
3) NO. 12 AWG TONING WIRE SOLID COPPER WITH BLUE INSULATION.
4) P.E. SERVICE TO BE TAPPED 90° OFF OF MAINLINE EITHER 3 OR 9 O'CLOCK POSITION UNLESS APPROVED BY CITY
5) WHEN INSTALLING 3/4" METER USE FORD A24 METER BUSHING FOR 1" ANGLE METER STOP. MAY INSTALL WYE BRANCH FOR 5/8" X 3/4" METERS UPON CITY APPROVAL.

TYPICAL 1" WATER SERVICE

	CITY OF BROOKINGS - STANDARD DETAIL	
	1" & 2" WATER SERVICE	4.33
	DATE: _____	

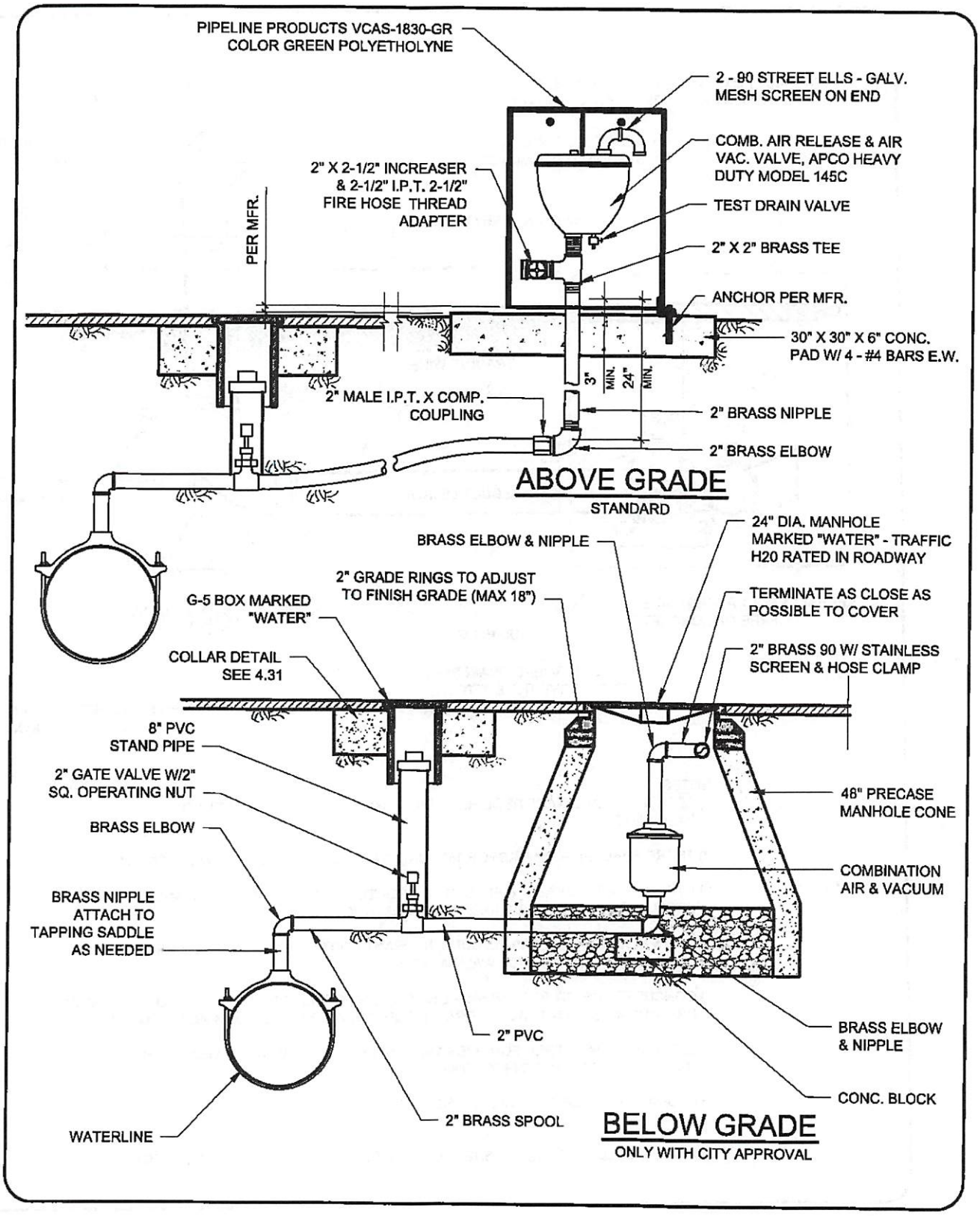


CITY OF BROOKINGS - STANDARD DETAIL	
2" WATER BLOW OFF ASSEMBLY	4.34
DATE: _____	

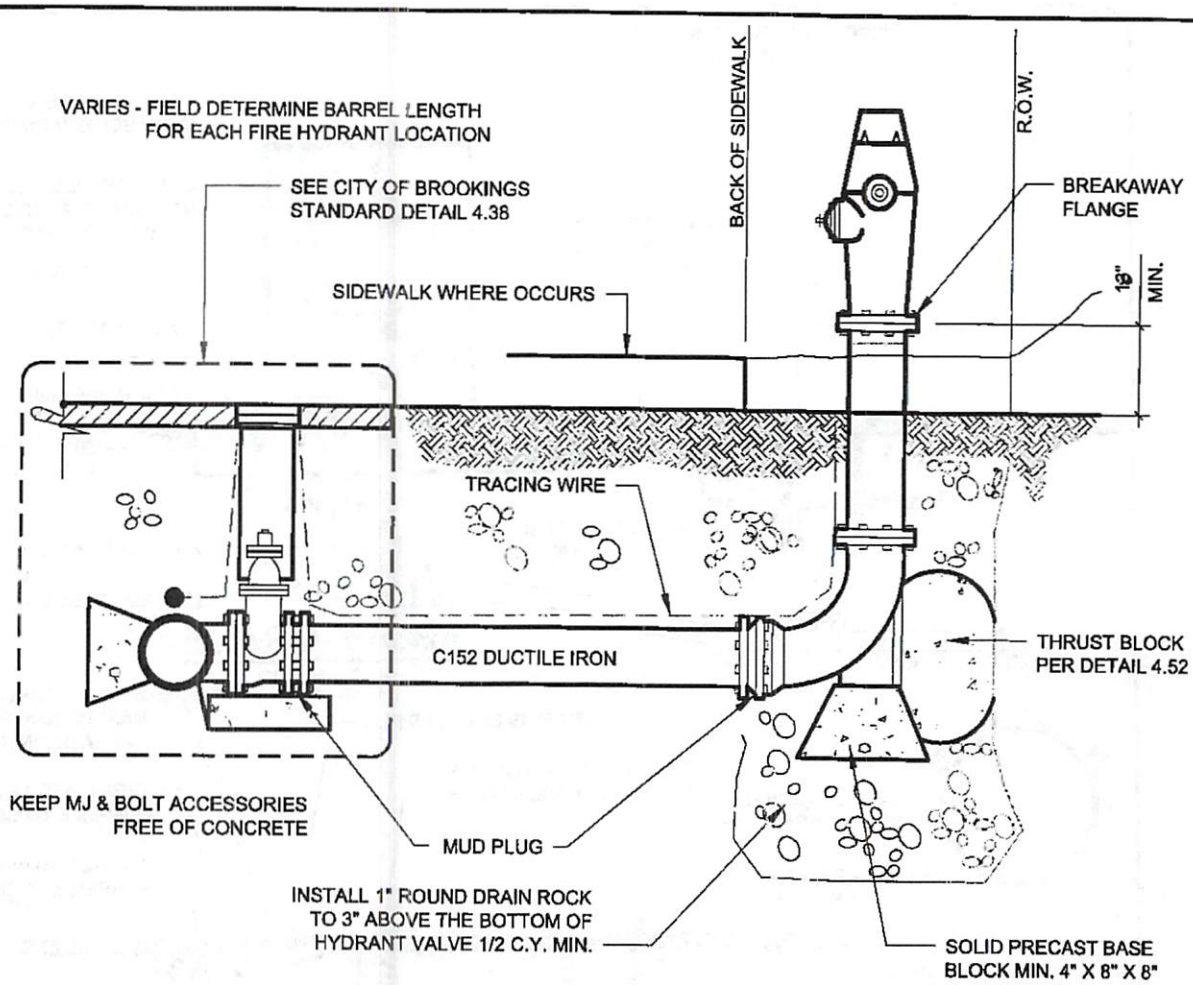


NOTE:
BLOW OFF ASSEMBLY AND END OF WATER MAIN MUST HAVE
A KICKER / THRUST BLOCK INSTALLED

	CITY OF BROOKINGS - STANDARD DETAIL	4.35
	STANDARD WATER BLOW OFF ASSEMBLY	
	DATE: _____	



	CITY OF BROOKINGS - STANDARD DETAIL	
	2" COMBINATION AIR & VACUUM RELIEF	4.36
	DATE: _____	



NOTES

1) RETAINER GLANDS ARE REQUIRED FOR ALL MECHANICAL JOINT FITTINGS, "MEGA LUG"

2) THERE SHALL BE A MINIMUM OF 36" HORIZONTAL CLEARANCE AROUND HYDRANT.

3) FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, POLES, AND OTHER OBSTRUCTIONS.

4) WHEN PLACED ADJACENT TO CURB, HYDRANT PORT SHALL BE 24" FROM FACE OF CURB & MAINTAIN ADA SIDE WALK WIDTHS.

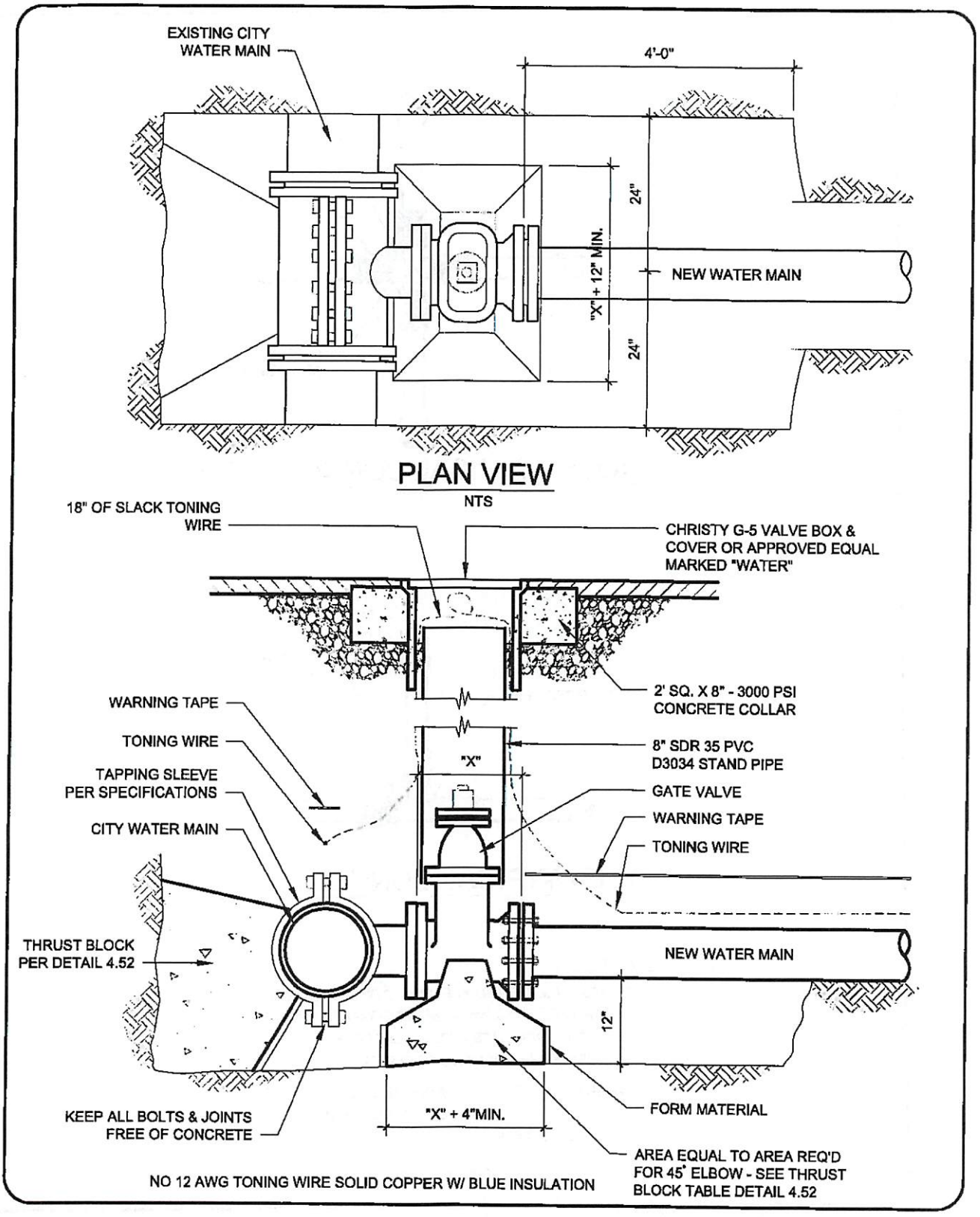
5) CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING 4.52. DO NOT BLOCK DRAIN HOLES & COVER MJ GLANDS & ACCESSORIES.

6) EXTENSIONS REQUIRED FOR HYDRANT SYSTEMS SHALL BE INSTALLED TO THE MANUFACTURER'S SPECIFICATIONS.

7) HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS.

8) INSTALL BOLLARDS (DETAIL 5.18) WHERE NEEDED TO PROTECT FROM COLLISION

	CITY OF BROOKINGS - STANDARD DETAIL	
	FIRE HYDRANT ASSEMBLY	4.37
	DATE: _____	

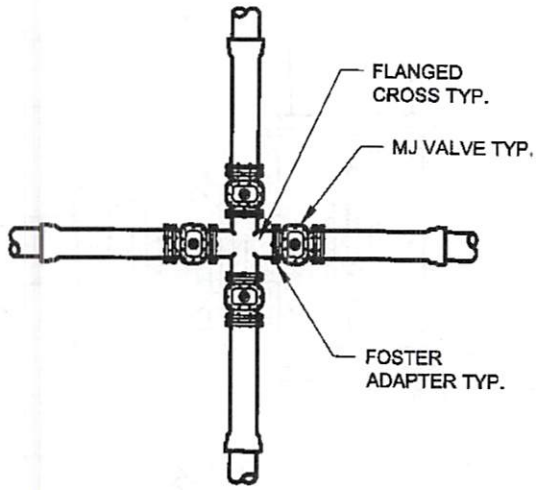


CITY OF BROOKINGS - STANDARD DETAIL

4" - 12" TAPPING SLEEVE & VALVE

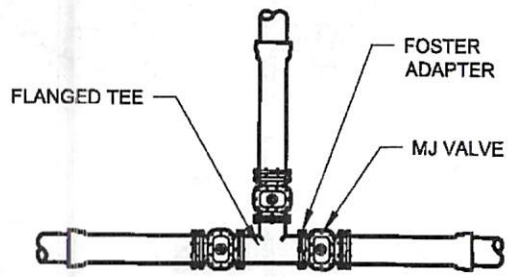
4.38

DATE: _____



CROSS - TYPICAL CONNECTIONS

NTS



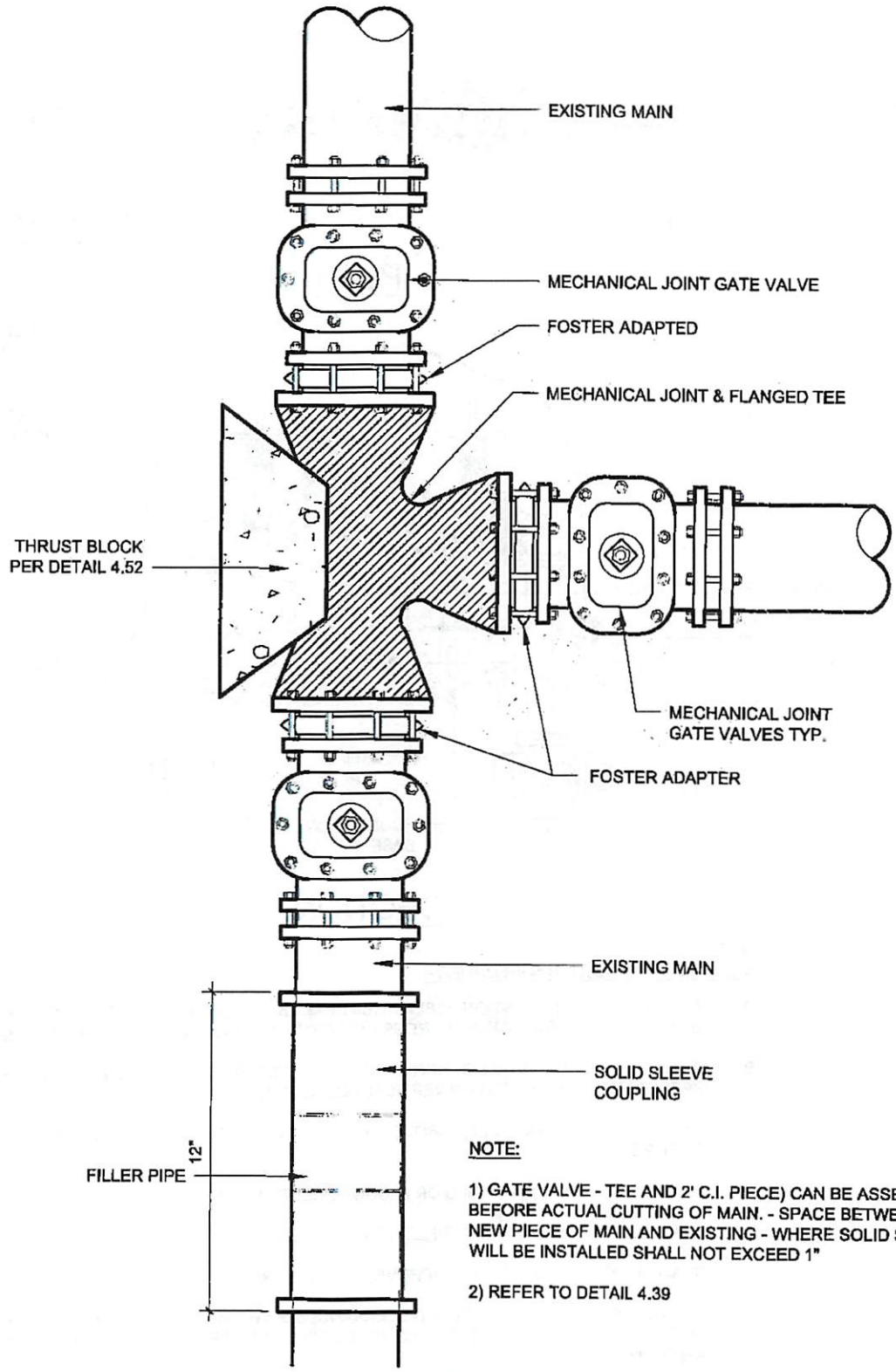
TEE - TYPICAL CONNECTIONS

NTS

NOTES:

1. VALVES SHALL GENERALLY BE LOCATED ON EACH BRANCH OF WATER MAIN INTERSECTIONS. WHERE RELATIVELY SHORT LINES (LESS THAN 500 FEET IN LENGTH) ARE INVOLVED, ONE OF THE TWO VALVES BETWEEN INTERSECTIONS MAY BE OMITTED.
2. WATER MAINS IN PUBLIC STREETS SHALL BE LOCATED PARALLEL TO AND 5 FEET NORTH OR WEST OF STREET CENTERLINES WHENEVER POSSIBLE.
3. SEE DETAIL 4.40 FOR CONSTRUCTION DETAIL

	CITY OF BROOKINGS - STANDARD DETAIL	4.39
	WATER MAIN CONNECTION AT INTERSECTIONS	
	DATE: _____	

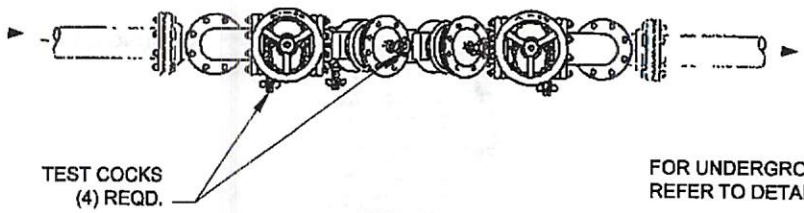


NOTE:

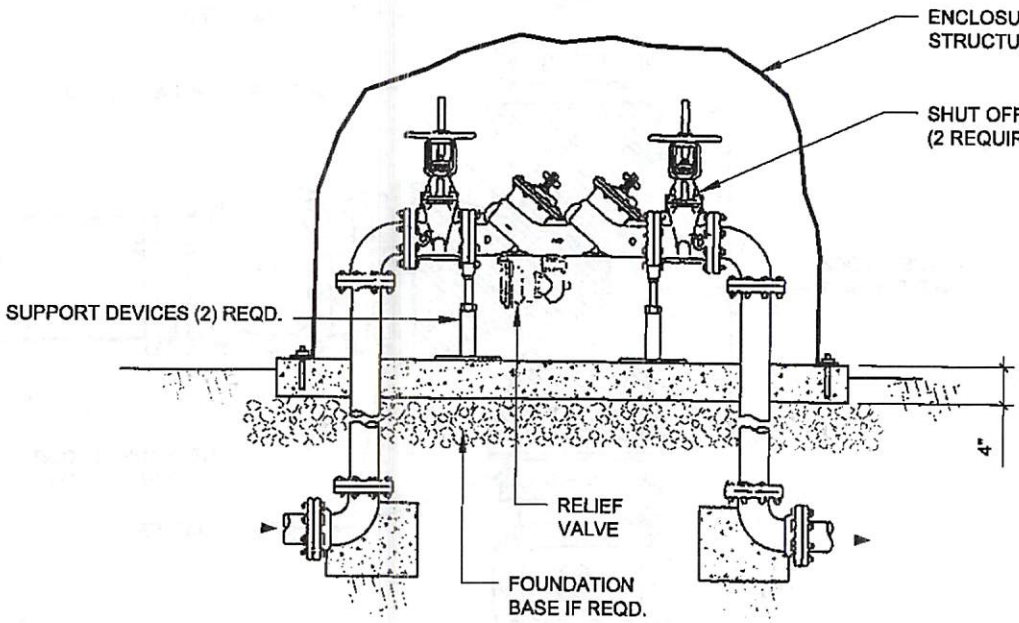
1) GATE VALVE - TEE AND 2' C.I. PIECE) CAN BE ASSEMBLED BEFORE ACTUAL CUTTING OF MAIN. - SPACE BETWEEN NEW PIECE OF MAIN AND EXISTING - WHERE SOLID SLEEVE WILL BE INSTALLED SHALL NOT EXCEED 1"

2) REFER TO DETAIL 4.39

	CITY OF BROOKINGS - STANDARD DETAIL	
	CUT-IN TEE & GATE VALVE	4.40
	DATE: _____	



PLAN



SECTION

NOTES:
BACKFLOW PREVENTION ASSEMBLIES -

A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE UNIVERSITY OF OREGON FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH.

B. SHALL ALWAYS BE INSTALLED HORIZONTALLY, NEVER VERTICALLY, UNLESS THEY ARE SPECIFICALLY APPROVED FOR VERTICAL INSTALLATION.

B. SHALL ALWAYS BE INSTALLED ABOVE THE 100 YEAR (1%) FLOOD LEVEL UNLESS APPROVED BY THE CITY.

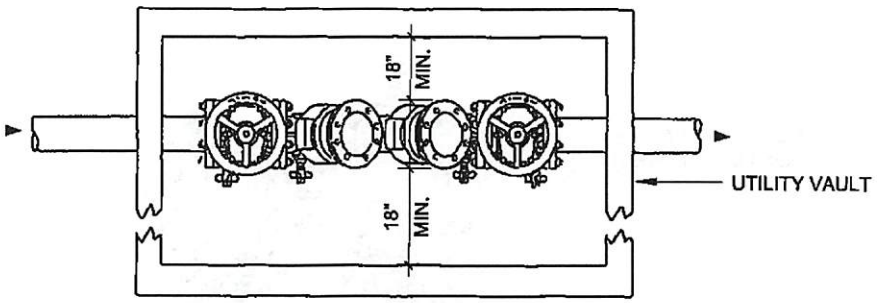
C. SHALL NEVER HAVE EXTENDED OR PLUGGED RELIEF VALVES

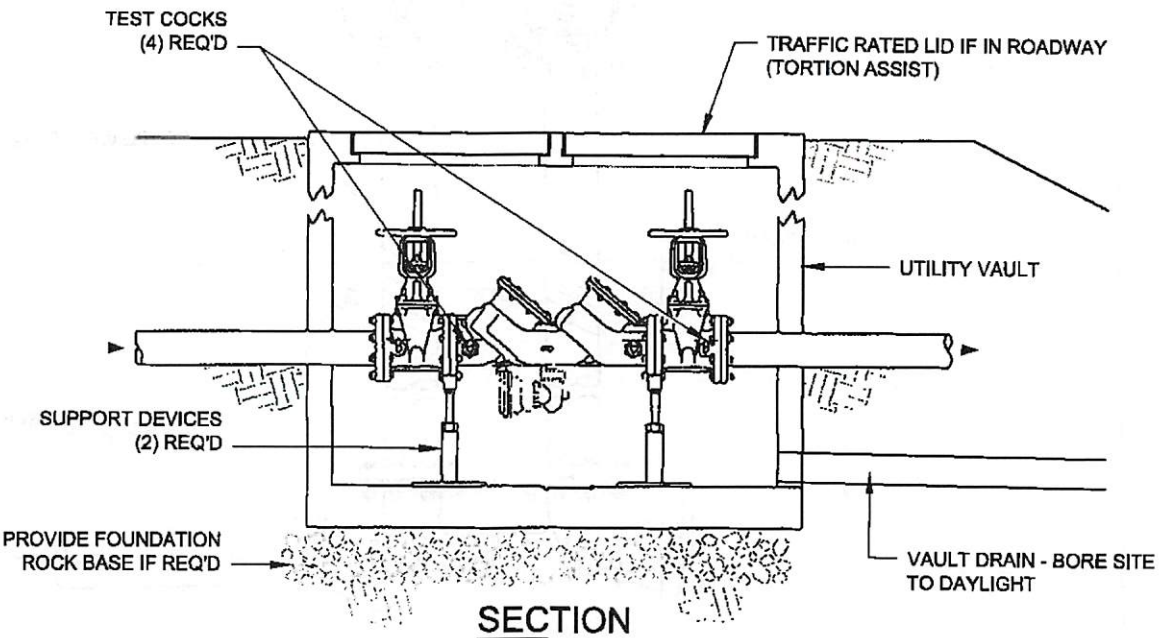
D. SHALL BE PROTECTED FROM FREEZING WHEN NECESSARY

E. SHALL BE PROVIDED WITH AN APPROVED AIR GAP DRAIN.

F. MAY BE INSTALLED WITH REDUCED CLEARANCES IF THE PIPES ARE 2 INCHES IN DIAMETER OR SMALLER, PROVIDED THAT THEY ARE ACCESSIBLE FOR HTE TESTING AND REPAIRING, AND APPROVED BY THE CITY.

	CITY OF BROOKINGS - STANDARD DETAIL	
	RP OR DC STANDARD BACKFLOW ASSEMBLY ABOVE GROUND	4.41
	DATE: _____	





SECTION

NOTES:
BACKFLOW PREVENTION ASSEMBLIES

A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE UNIVERSITY OF OREGON FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH.

B. SHALL CONFORM TO BOTTOM AND SIDE CLEARANCES WHEN THE BACKFLOW ASSEMBLY IS INSTALLED INSIDE A VAULT.

C. MAY BE INSTALLED VERTICALLY AS WELL AS HORIZONTALLY PROVIDED THE ASSEMBLY IS SPECIFICALLY LISTED FOR THAT ORIENTATION IN THE DEPARTMENTS APPROVED BACKFLOW PREVENTION ASSEMBLY LIST.

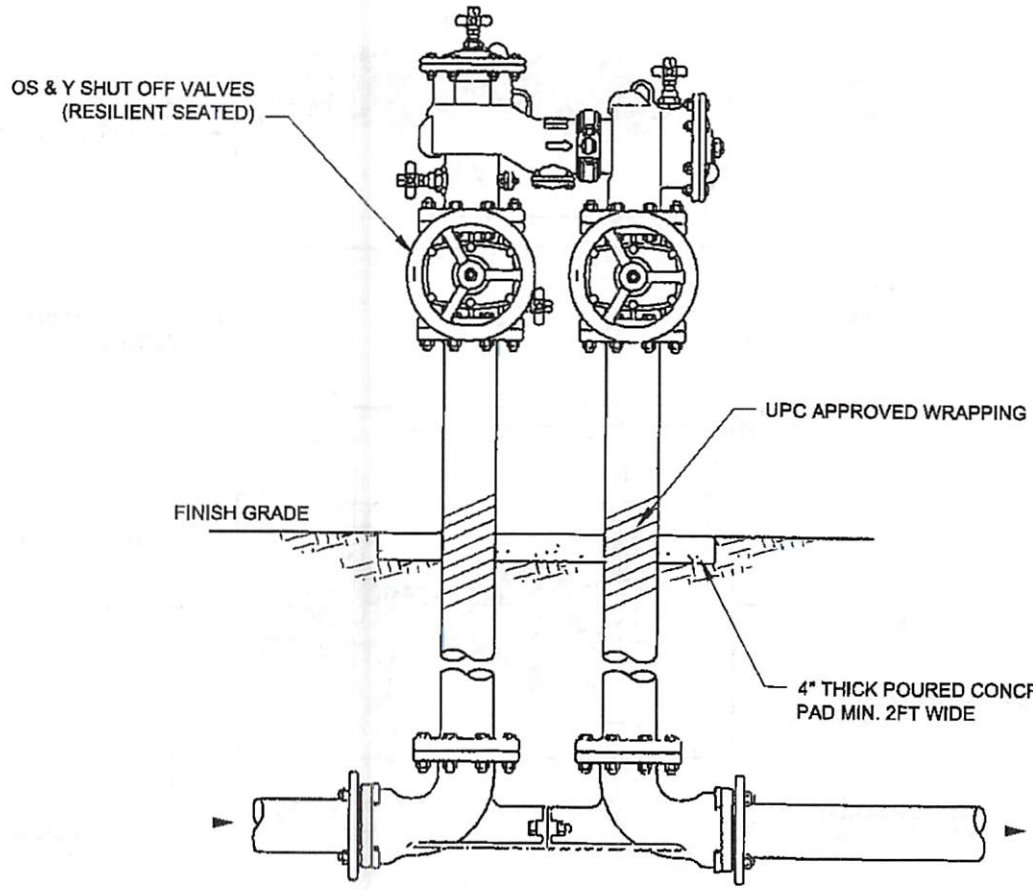
D. PROVIDE THAT WATER-TIGHT FITTED PLUGS OR CAPS ARE INSTALLED INTHE COCKS, AND THE A SSEMBLY SHALL NOT BE SUBJECT TO CONTINUOUS IMMERSION

E. SHALL NOT BE INSTALLED AT A HEIGHT GREATER THAN 5 FEET UNLESS THERE IS A PERMANENTLY INSTALLED PLATFORM MEETING OREGON OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OR-OSHA) STANDARDS TO FACILITATE SERVICING THE ASSEMBLY.

F. MAY BE INSTALLED WITH REDUCED CLEARANCES IN THE PIPES ARE 2 INCHES IN DIAMETER OR SMALLER, PROVIDED THAT THEY ARE ACCESSIBLE FOR TESTING AND REPAIRING, AND APPROVED BY THE CITY.

G. VAULT WITH RP REQUIRES 4 INCHES PVC DRAIN SITED TO DAYLIGHT FOR FREE DRAINAGE

CITY OF BROOKINGS - STANDARD DETAIL	
DOUBLE CHECK OR RP BELOW GROUND VAULT	4.42
DATE: _____	



NOTES:

A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE UNIVERSITY OF OREGON FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH.

B. BACKFLOW DEVICES SHALL BE INSTALLED ADJACENT TO AND ON PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE WATER METER

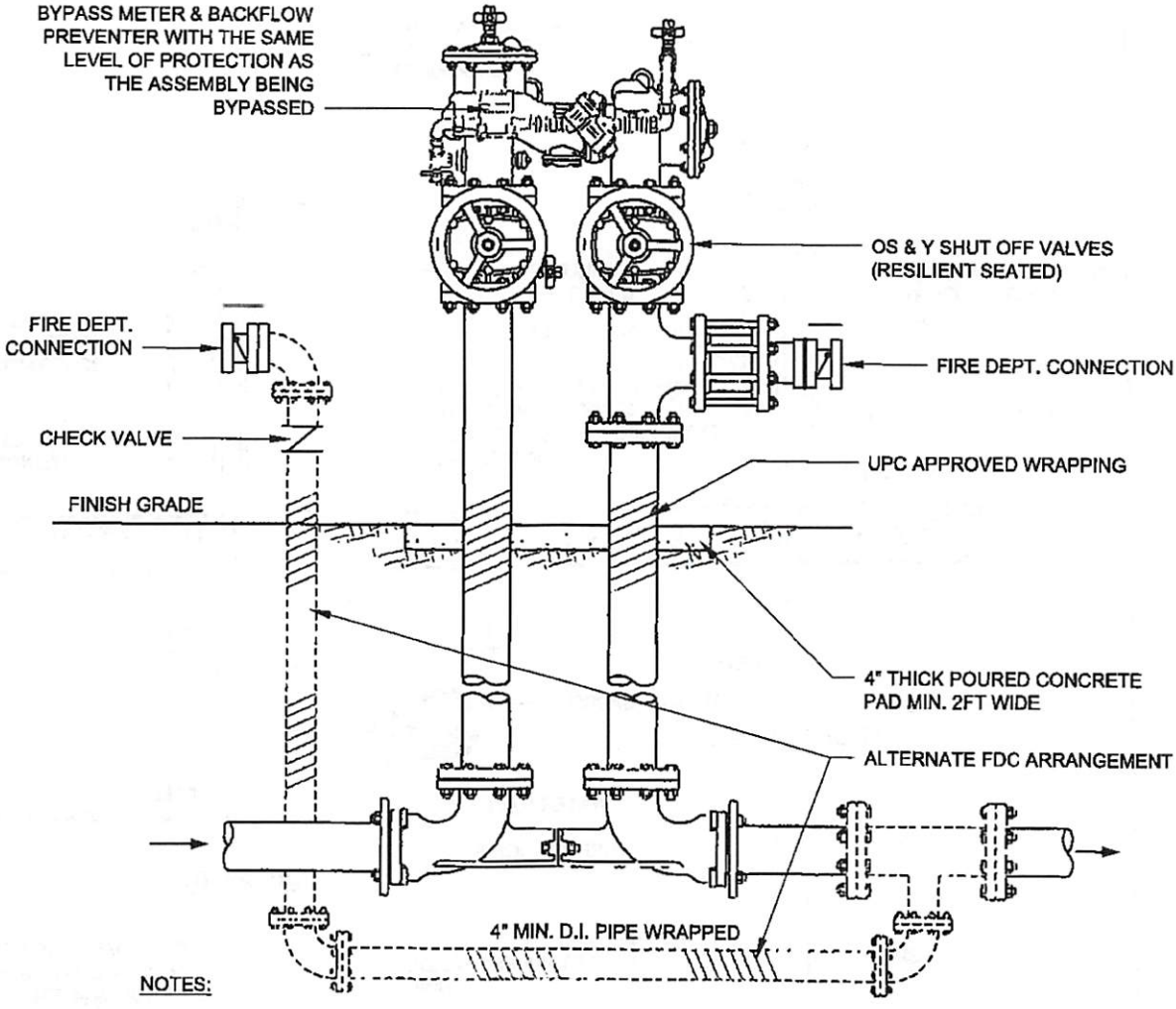
C. ALL DEVICES WILL HAVE RESILIENT SEATED SHUT OFF VALVES. TEST COCKS WILL HAVE THREADED ENDS

E. PRESSURE DIFFERENTIAL VALVE OPENING TO BE 24" MINIMUM ABOVE GRADE

F. ALL PIPES AND SPOOLS SHALL BE DUCTILE IRON AND ALL JOINTS FLANGED

G. MASTIC ALL BOLTS/NUTS OR USE 316 GRADE STAINLESS STEEL COMPONENTS

	CITY OF BROOKINGS - STANDARD DETAIL	
	RP OR DC BACKFLOW ASSEMBLY - RESTRICTED SPACE	4.43
	DATE: _____	



NOTES:

A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE UNIVERSITY OF OREGON FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH.

B. FIRE DEPARTMENT CONNECTION TO REMAIN ZISIBLE AND ACCESSIBLE. PAINT SAFETY YELLOW

C. D.I. PIPE TO BE PROTECTED WRAP CA-1200. POLYGUARD CA-14 MASTIC OR APPROVED EQUAL

D. ALL CONNECTIONS TO BE FLANGED

E. ALL TRIM HARDWARE TO BE BRASS OR BRONZE

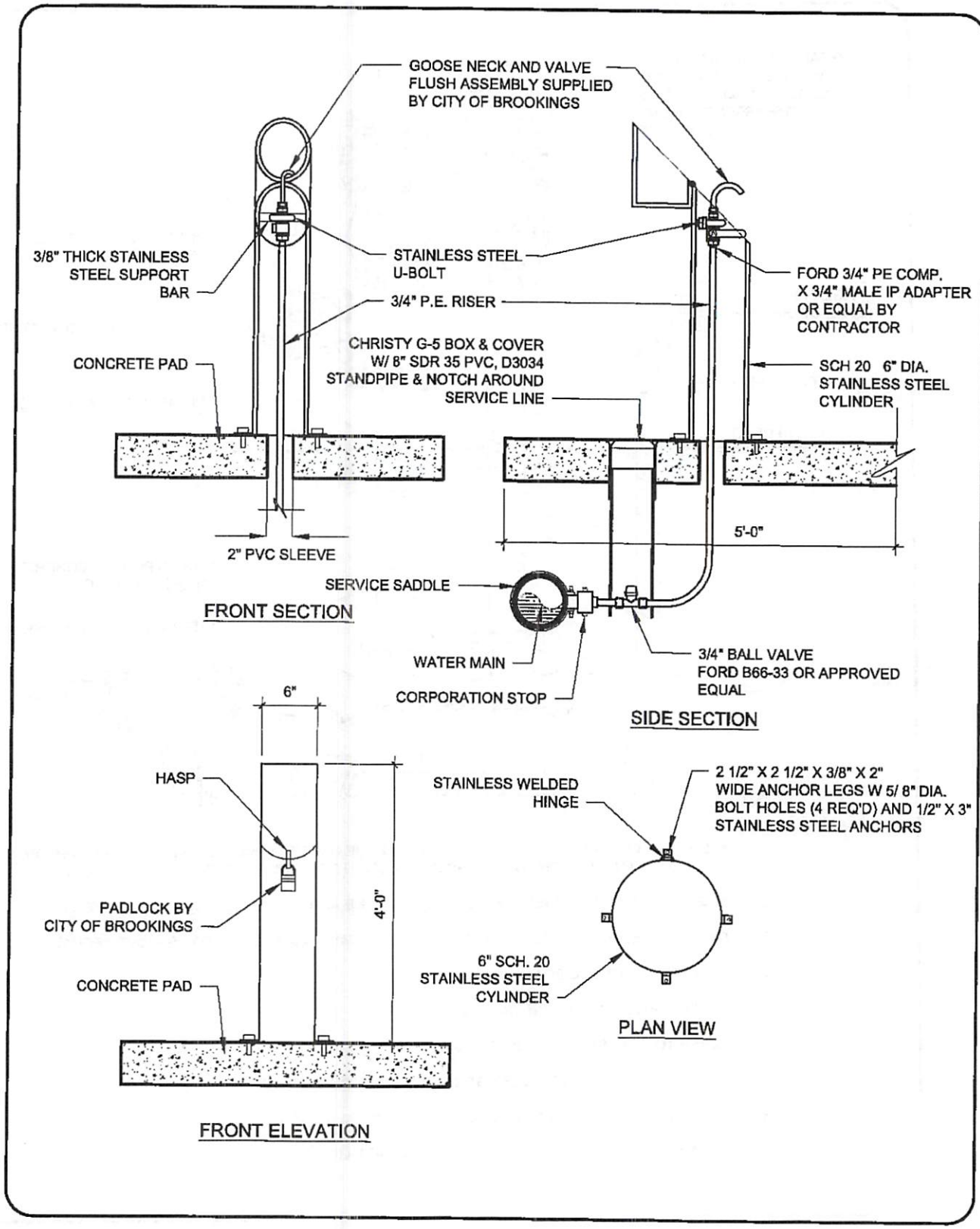
F. METER TO BE CUBIC FT. REGISTRATION.

G. MASTIC ALL BOLTS/NUTS OR USE STAINLESS STEEL COMPONENTS

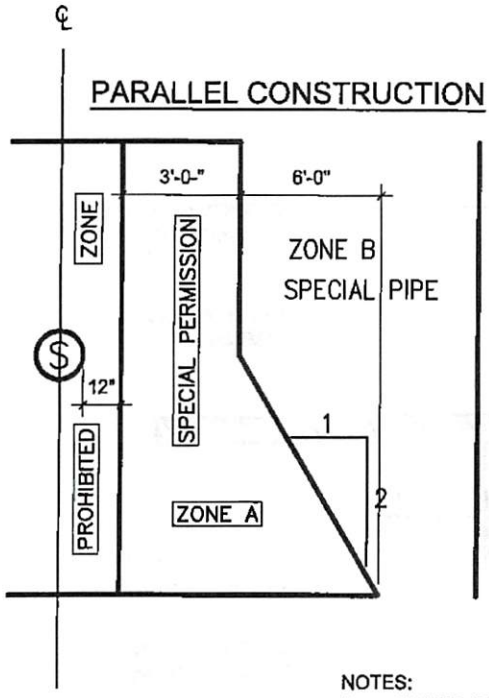
H. FIRE DEPT. CONNECTION TO BE LOCATED PER FIRE MARSHALL

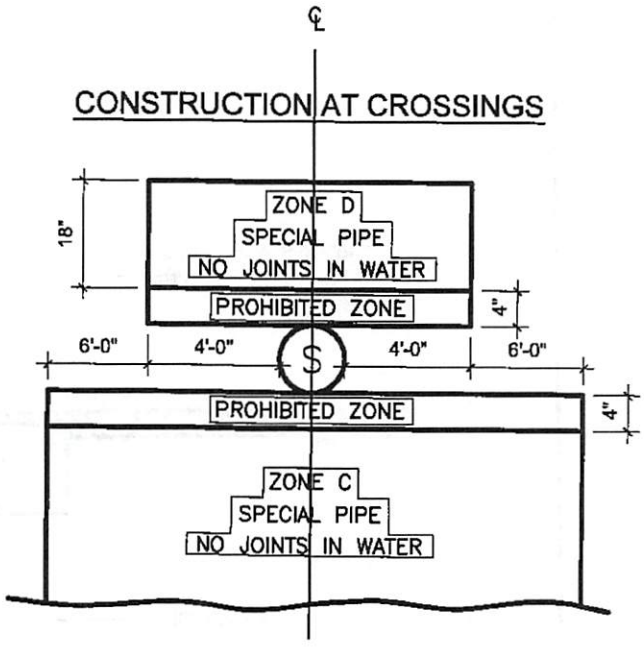
I. DCDA TO BE LOCATED WITH IN 10 FT. OF PROPERTY LINE

	CITY OF BROOKINGS - STANDARD DETAIL	4.44
	FIRE SERVICE DOUBLE CHECK BACKFLOW ASSEMBLY	
	DATE: _____	



	CITY OF BROOKINGS - STANDARD DETAIL	
	WATER SAMPLING STATION	**4.46**
	DATE: _____	





NOTES:
1. ZONES IDENTICAL ON EITHER SIDE OF CENTERLINE
2. ZONE "P" IS A PROHIBITED ZONE

ZONE SPECIAL CONSTRUCTION REQUIRED FOR WATER

A. NO WATER MAINS PARALLEL TO SEWERS SHALL BE CONSTRUCTED WITHOUT APPROVAL FROM THE CITY

B. THE REQUIREMENTS FOR CONSTRUCTING A WATER MAIN PARALLELING A SEWER LINE SHALL BE AS FOLLOWS:

1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING
2. DIPPED AND WRAPPED ONE-FOURTH-INCH-THICK WELDED STEEL PIPE.
3. CLASS 200 PRESSURE RATED PLASTIC PVC WATER PIPE. DR 14 PER AWWA C900 OR EQUIVALENT
4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300 OR C301 OR C303

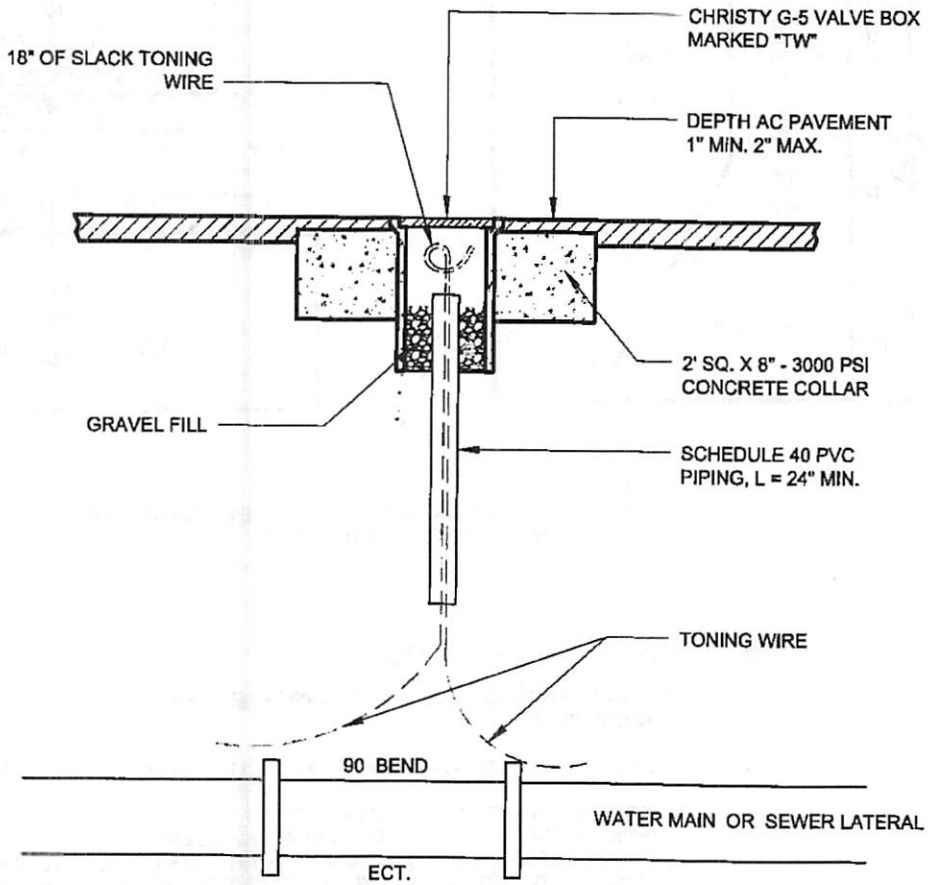
C. A WATER MAIN CONSTRUCTED CROSSING A SEWER LINE SHALL HAVE NO JOINTS AND BE CONSTRUCTED OF ONE OF THE FOLLOWING:

1. DUCTILE IRON PIPE WITH HOT DIPPED BITUMINOUS COATING
2. DIPPED AND WRAPPED ONE-FOURTH-INCH-THICK WELDED STEEL PIPE
3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE PER AWWA OR EQUIVALENT
4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300 OR C301 OR C303

D. A WATER MAIN CONSTRUCTED CROSSING A SEWER LINE SHALL HAVE NO JOINTS WITHIN FOUR FEET FROM EITHER SIDE OF THE SEWER AND BE CONSTRUCTED OF ONE OF THE FOLLOWING:

1. DUCTILE IRON PIPE WITH HOT DIPPED BITUMINOUS COATING
2. DIPPED AND WRAPPED ONE-FOURTH-INCH-THICK WELDED STEEL PIPE
3. CLASS 200 PRESSURE RATED PLASTIC WATER PIPE (DR 14 AWWA C900) OR EQUIVALENT
4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA C300 OR C301 OR C303

	CITY OF BROOKINGS - STANDARD DETAIL	
	SANITARY SEPARATION - WATER (CASE-2)	4.47
	DATE: _____	



NOTES:

1) PLACE TONING WIRE BOX ABOVE NEW WATERLINE. TONING WIRE SHALL BE BROUGHT TO SURFACE INSIDE EACH TONING WIRE BOX LOCATED ABOVE D.I.P. FITTING.

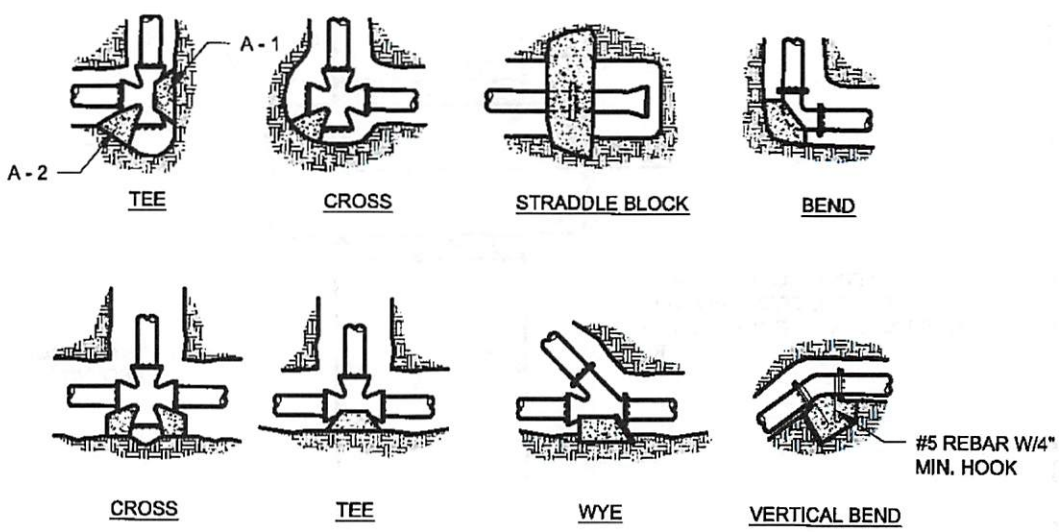
2) WHEN WATER VALVES ARE NOT AVAILABLE FOR TONING WIRE STATIONS.

3) SURFACE TONING WIRE AT 500' SPACING.

	CITY OF BROOKINGS - STANDARD DETAIL	
	TONING / LOCATING WIRE BOX	4.51
	DATE: _____	

(HORIZONTAL) BEARING AREA OF THRUST BLOCK IN SQUARE FEET						
FITTING SIZE	VLV,TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND PLUGGED CROSS: TEE PLUGGED ON RUN	45 BEND	22-1/2 BEND	11-1/4 BEND
2	0.2	0.2	0.3	0.2	0.1	0.05
3	0.5	0.9	0.8	0.4	0.2	0.1
4	0.9	1.4	1.3	0.7	0.4	0.2
6	2.1	2.8	3.0	1.6	0.8	0.4
8	3.8	4.8	5.3	2.9	1.5	0.7
10	5.9	7.3	8.3	4.5	2.3	1.2
12	8.5	10.3	12.0	6.5	3.3	1.7
14	11.5	13.8	16.3	8.8	4.5	2.3
16	15.1	17.8	21.3	11.5	5.9	3.0
18	19.1	22.4	27.0	14.6	7.4	3.7
20	23.6	27.5	33.3	18.0	9.2	4.6
24	33.9	39.2	48.0	26.0	13.2	6.7

(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS				
FITTING SIZE	90 BEND	45 BEND	22-1/2 BEND	11-1/4 BEND
2	0.2	0.1	0.0	0.0
3	0.4	0.2	0.1	0.1
4	0.7	0.4	0.2	0.1
6	1.5	0.8	0.4	0.2
8	2.7	1.5	0.8	0.4
10	4.3	2.3	1.2	0.6
12	6.1	3.3	1.7	0.8
14	8.3	4.5	2.3	1.2
16	10.9	5.9	3.0	1.5
18	13.8	7.5	3.8	1.9
20	17.0	9.2	4.7	2.4
24	24.5	13.3	6.8	3.4



NOTES:

1) CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.

2) ALL CONCRETE TO BE 3000 PSI

3) INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING BLOCKING.

4) CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES WITH FORMS.

5) SEE TYPICAL HYDRANT SETTING DETAILS FOR BLOCKING LOCATIONS.

RODS FOR VERTICAL BENDS		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#5	30"
14"-16"	#8	36"

BEARING AREA OF REDUCERS SHALL BE THE DIFFERENCE BETWEEN VALUES FOR DEAD ENDS FOR EACH END SIZE (IE. 6X8: 3.8-2.1 = 1.7 SQ. FT.)

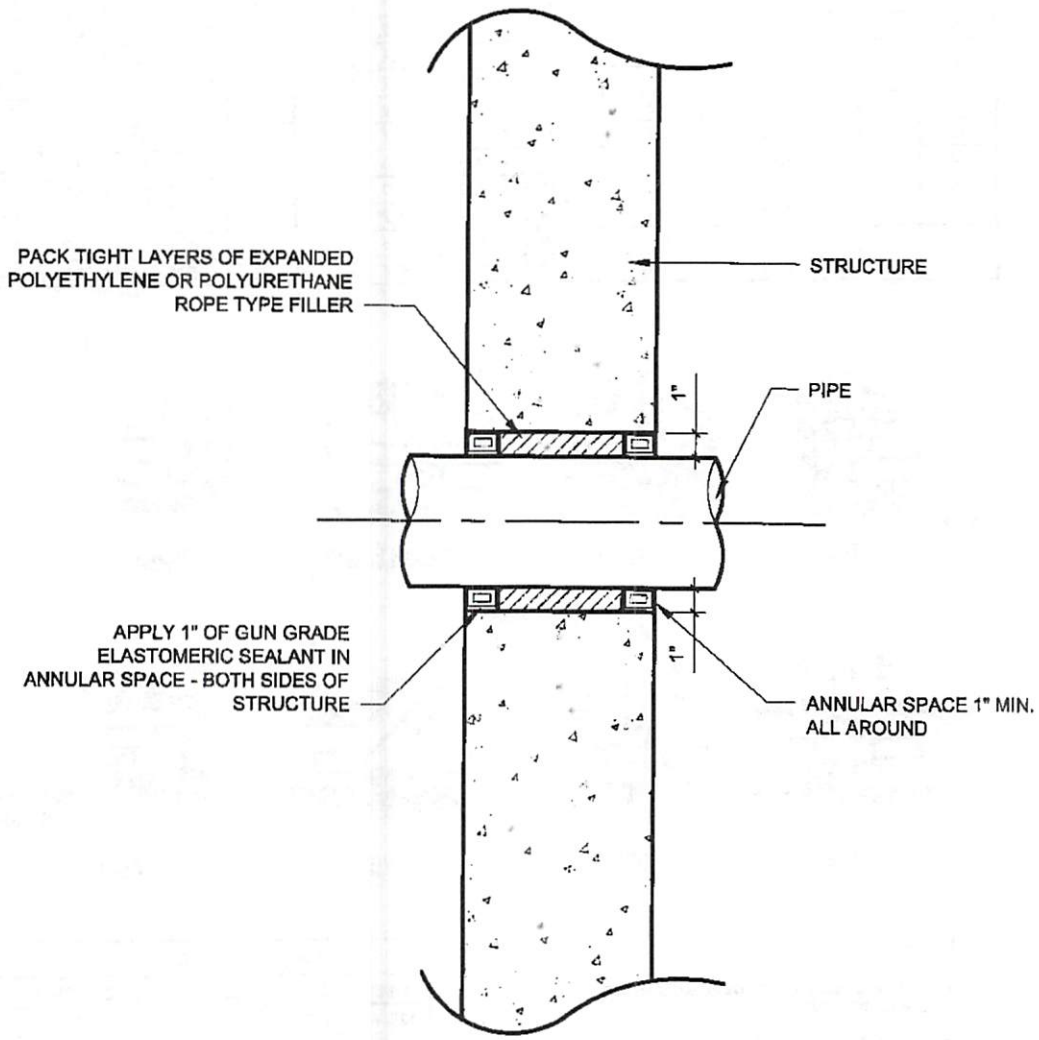
VALUES BASED ON 150 PSI WATER PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.

CITY OF BROOKINGS - STANDARD DETAIL

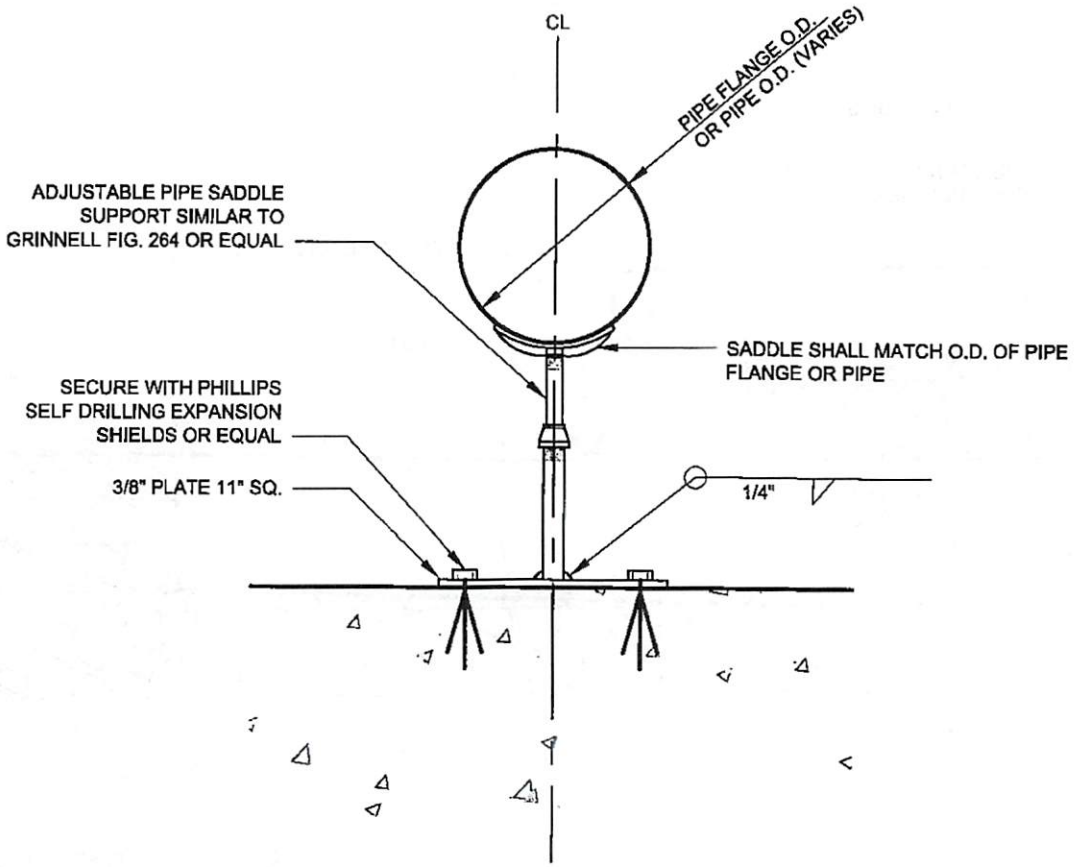
THRUST BLOCKING

DATE: _____

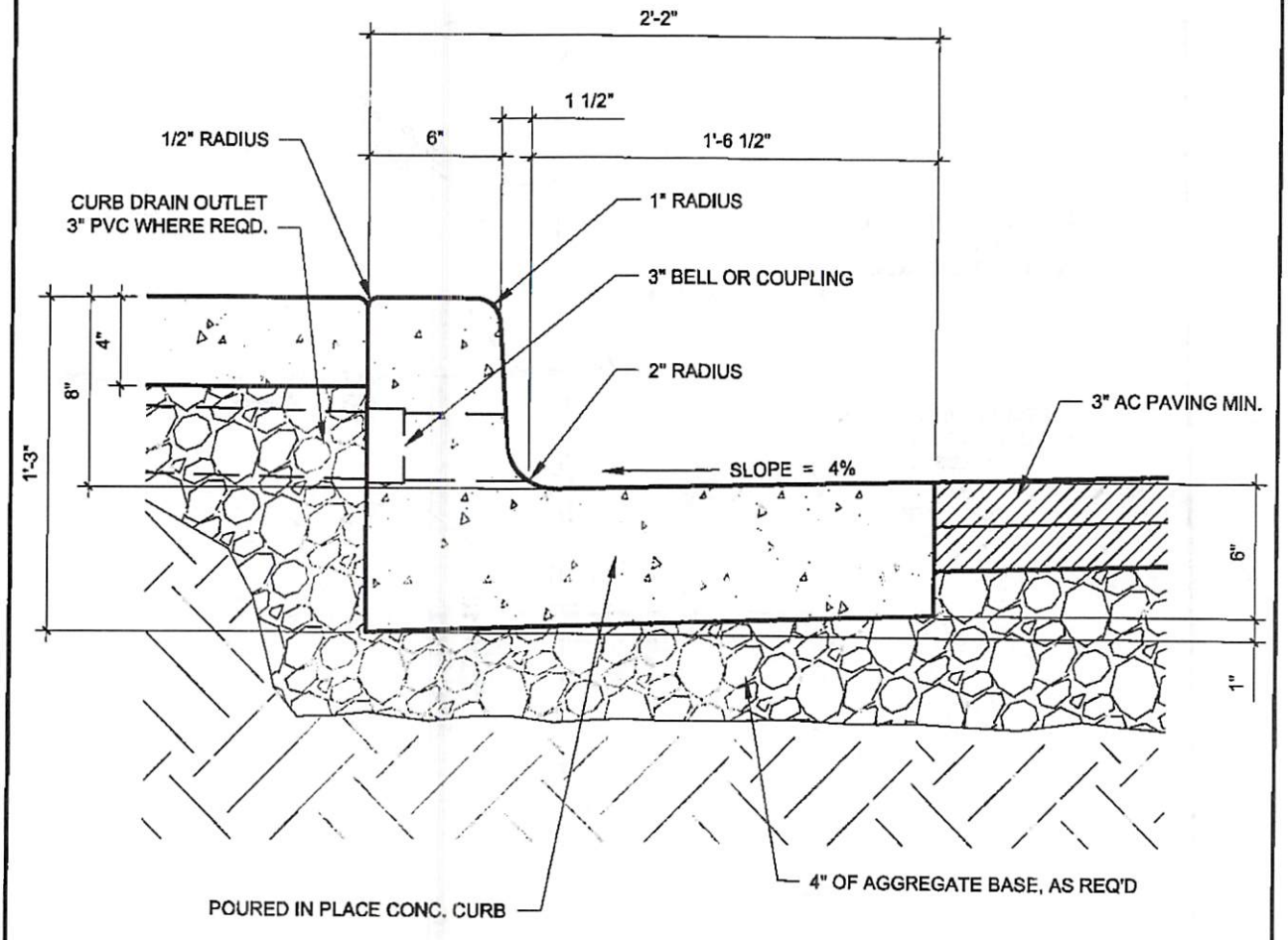
4.52



	CITY OF BROOKINGS - STANDARD DETAIL	
	PIPE PENETRATION DETAIL	4.53
	DATE: _____	



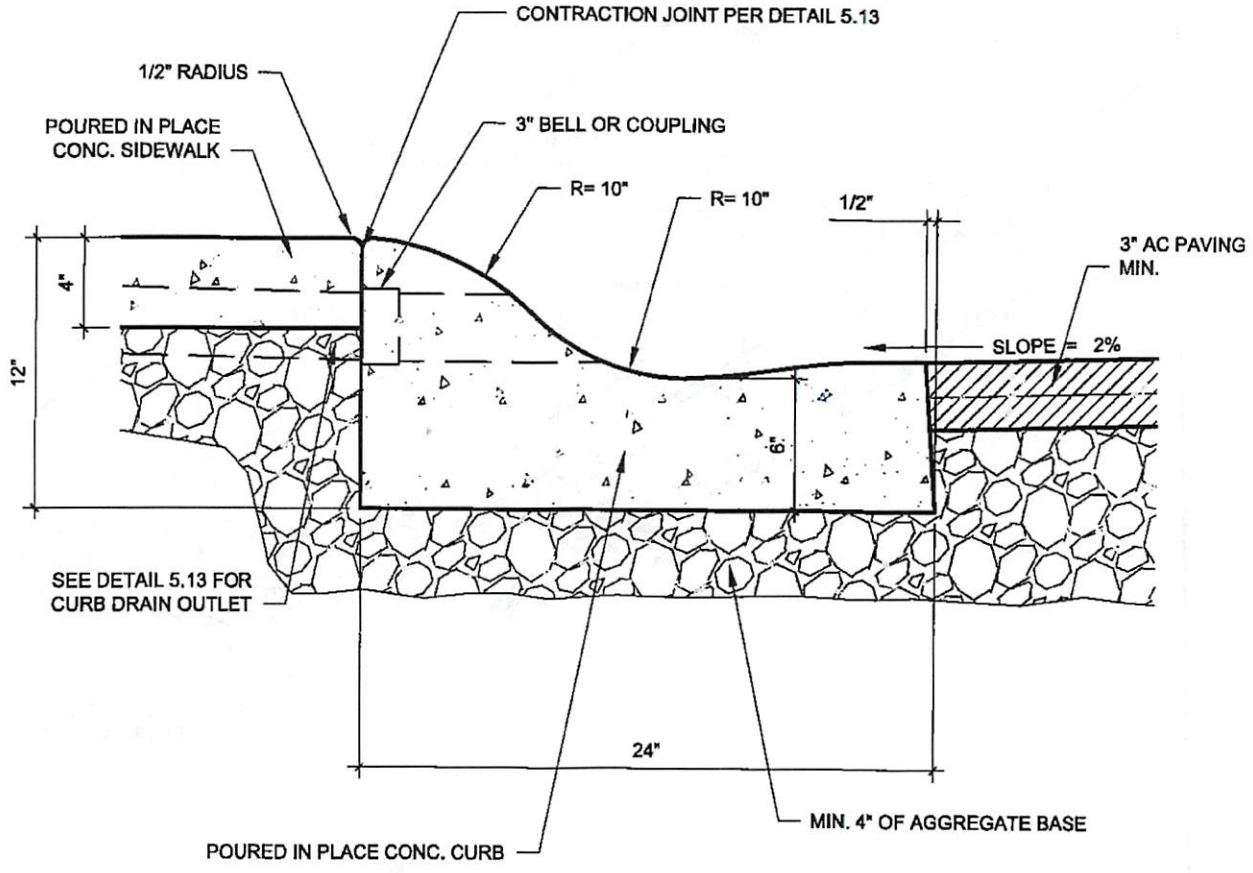
	CITY OF BROOKINGS - STANDARD DETAIL	4.54
	PIPE SUPPORT DETAIL	
	DATE: _____	



NOTE:

1. REFER TO DETAIL 5.13 FOR CONTRACTION JOINTS
2. MINIMUM DIMENSION STANDARDS NOTED
3. CONCRETE PER SPECIFICATIONS

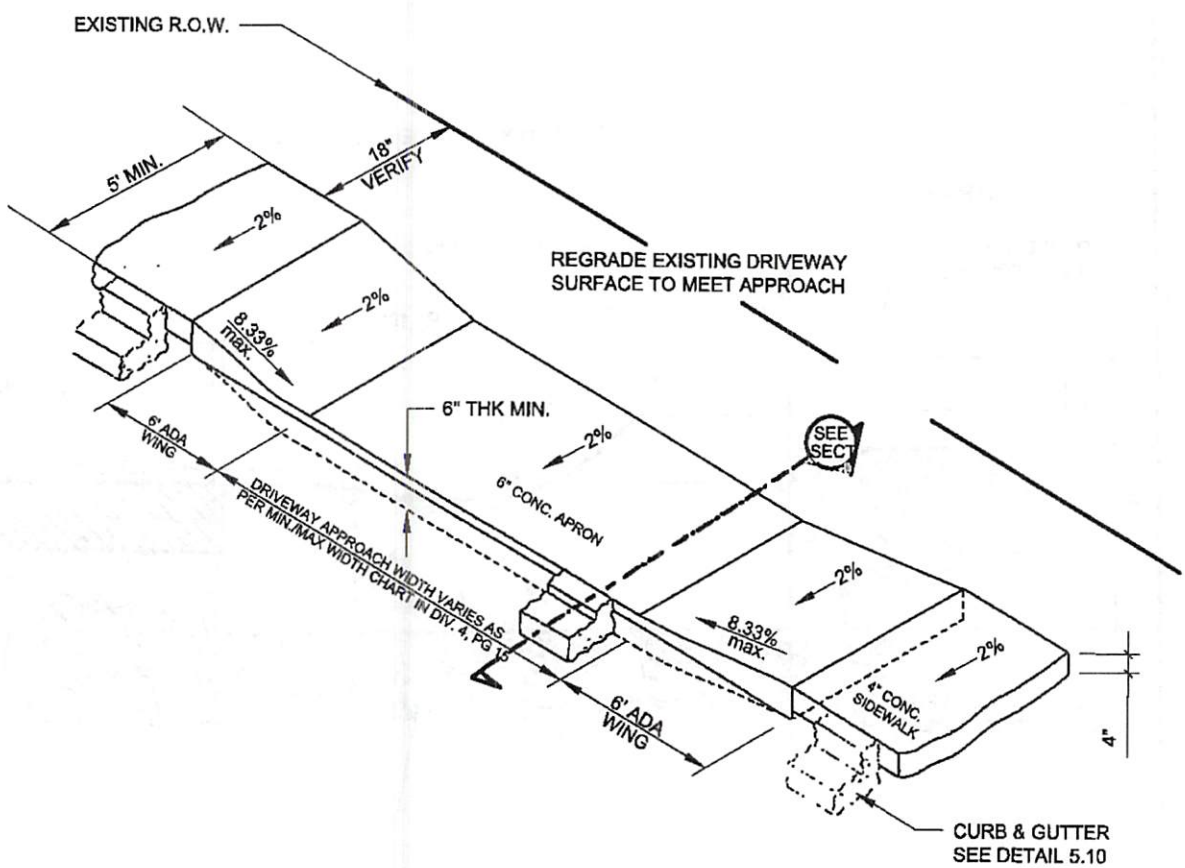
	CITY OF BROOKINGS - STANDARD DETAIL	5.10
	STANDARD CURB & GUTTER	
	DATE: _____	

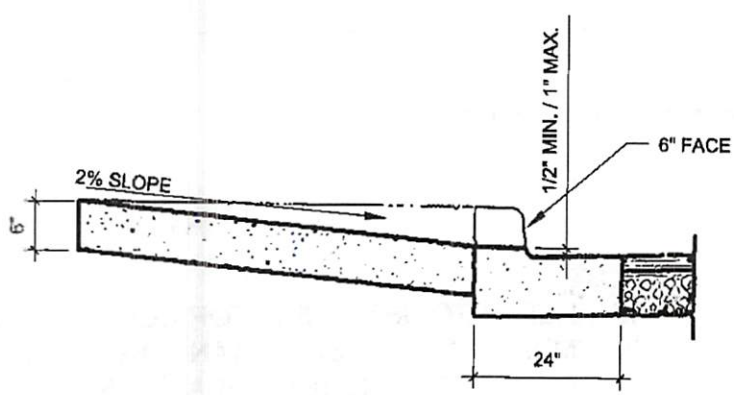


NOTE:

1. REFER TO DETAIL 5.13 FOR CONTRACTION JOINTS
2. MINIMUM DIMENSION STANDARDS NOTED
3. CONCRETE PER SPECIFICATIONS

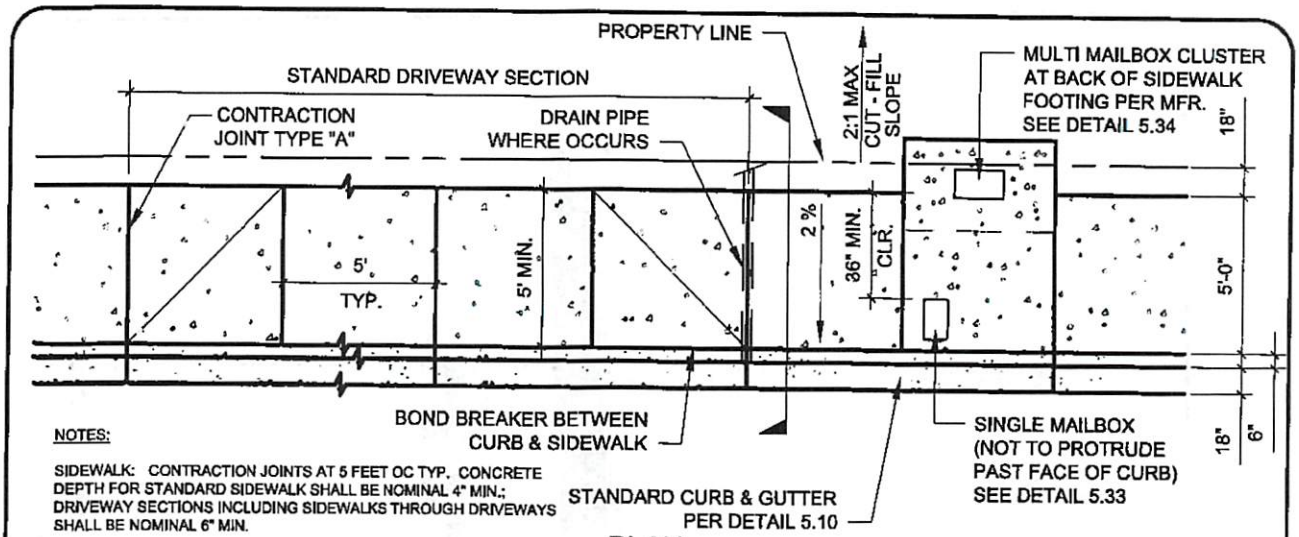
	CITY OF BROOKINGS - STANDARD DETAIL	5.11
	ROLLED CURB - DAWSON TRACT ONLY	
	DATE: _____	





SECTION AT CURB CUT

CITY OF BROOKINGS - STANDARD DETAIL		5.12
DRIVEWAY CURB CUT		
	DATE: _____	

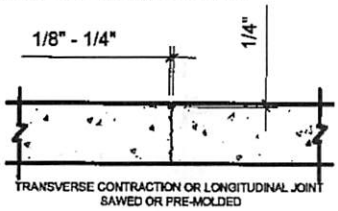


NOTES:

SIDEWALK: CONTRACTION JOINTS AT 5 FEET OC TYP. CONCRETE DEPTH FOR STANDARD SIDEWALK SHALL BE NOMINAL 4" MIN.; DRIVEWAY SECTIONS INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE NOMINAL 6" MIN.

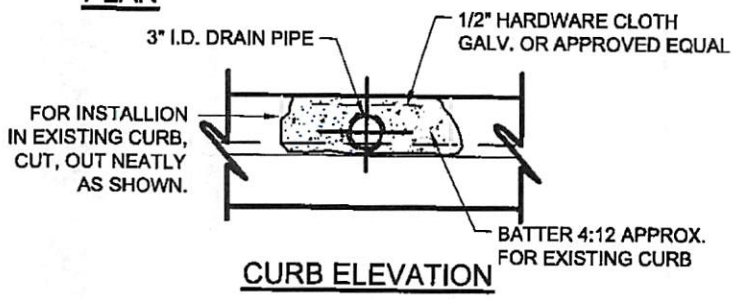
CURB: CONTRACTION JOINTS AT 15 FEET

PLAN

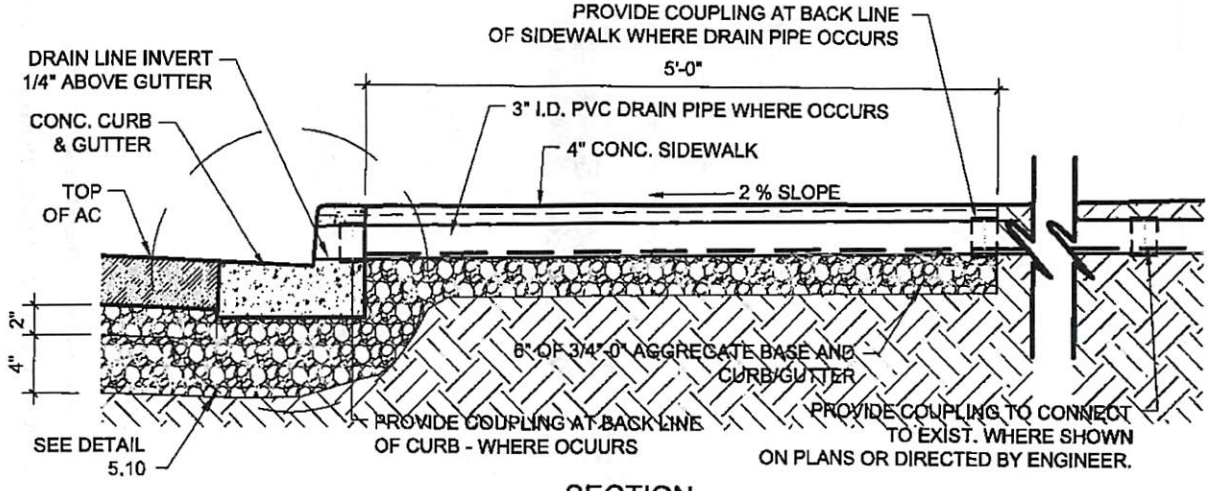


JOINT TYPE A

CONTROL (CONTRACTION) JOINTS



CURB ELEVATION



SECTION

NOTE:

1. (2) DRAINS PER LOT MAXIMUM. NO DRAIN TO BE INSTALLED WITHIN DRIVEWAY AREA OR WITHIN 1 FT. OF WATER METER BOX OR SEWER CLEANOUT.
2. WHERE LOCATIONS PERMIT A CONTRACTION JOINT CENTERED OVER TOP OF PIPE MAY BE USED IN LIEU OF MESH. PRIOR APPROVAL BY CITY ENGINEER REQ'D.

* 3. IF ROLLED CURB USE 6' SIDEWALK

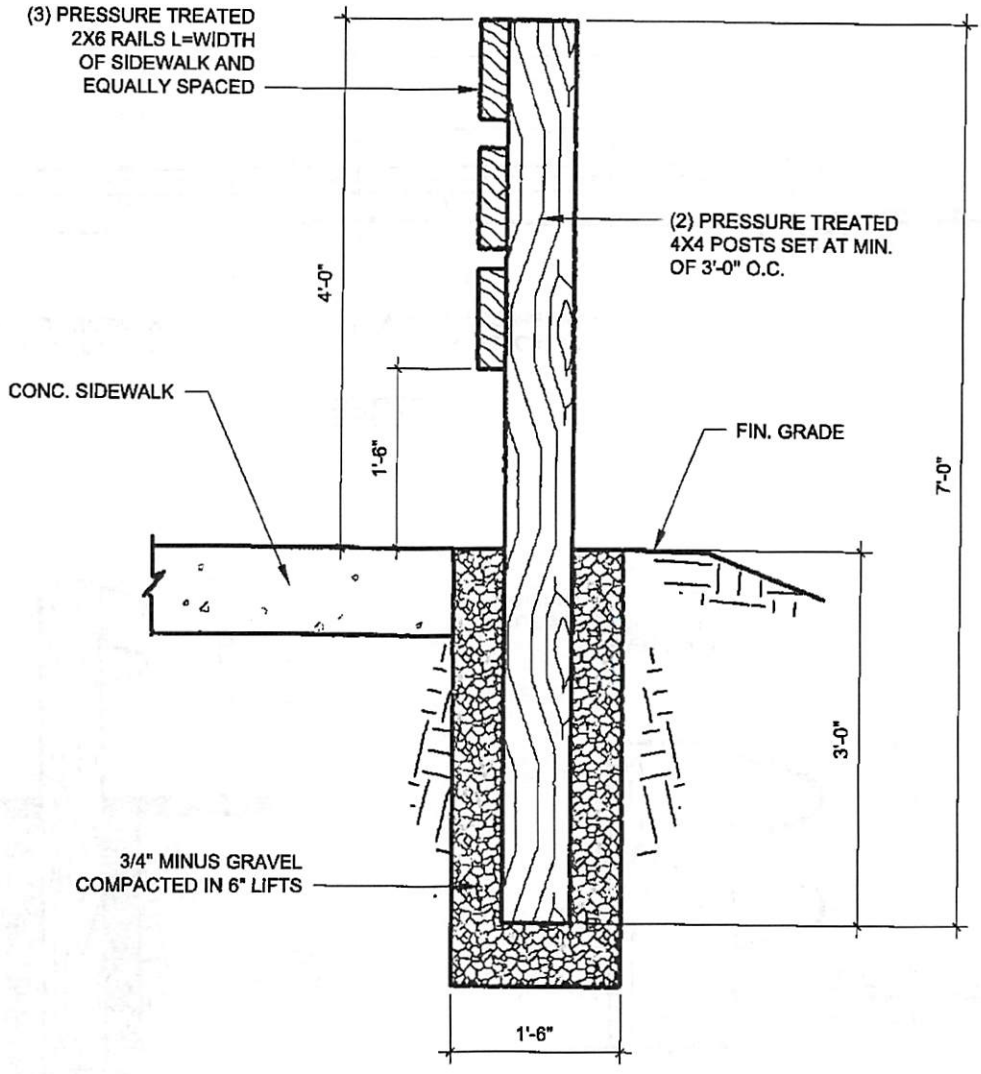
CITY OF BROOKINGS - STANDARD DETAIL	
CURB & SIDEWALK PLAN	5.13
DATE: _____	

SECTION

NOTE:

1. ACTUAL BASE REQUIREMENTS MAY BE ALTERED BY CITY DUE TO PARTICULAR SITE CHARACTERISTICS
2. WIDTH TO BE IN ACCORDANCE WITH CITY OF BROOKINGS SUBDIVISION ORDINANCE

	CITY OF BROOKINGS - STANDARD DETAIL	5.14
	TYPICAL STREET SECTION	
	DATE: _____	



SECTION

NOTES:

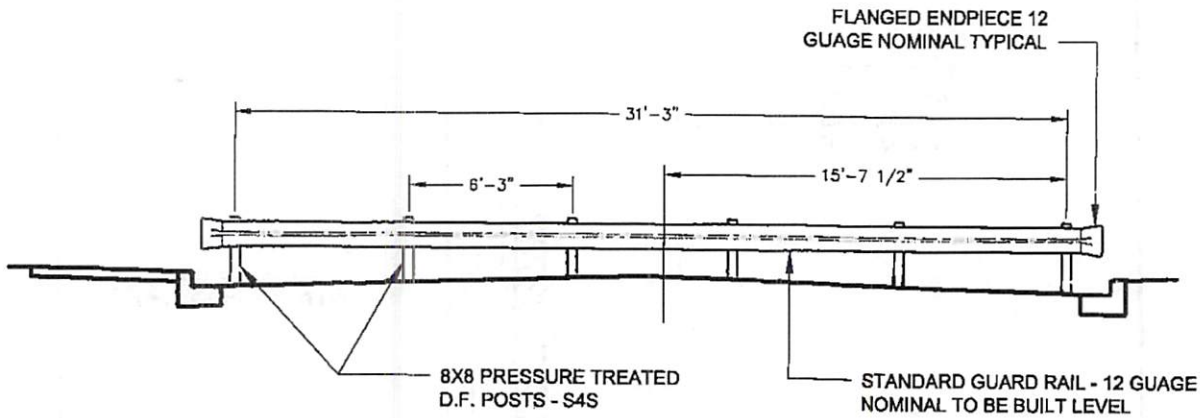
1) CONTRACTOR TO FIELD VERIFY WIDTH OF SIDEWALK BEFORE CONSTRUCTION OF BARRICADE.

2) ALL MATERIALS SHALL BE AS SPECIFIED

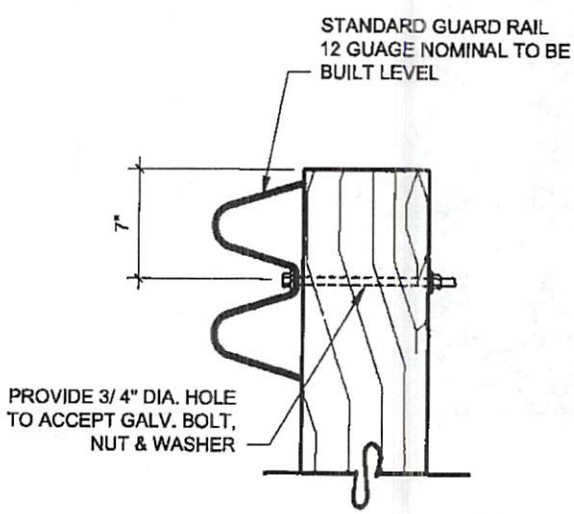
3) BARRICADE TO BE PAINTED WHITE WITH TWO COATS OF PREMIUM EXTERIOR PAINT.

4) ALL FASTENERS SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.

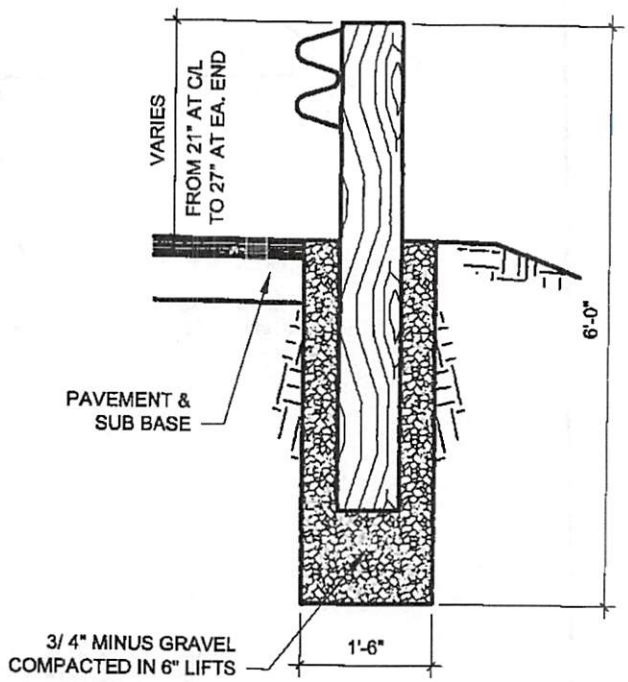
	CITY OF BROOKINGS - STANDARD DETAIL	
	SIDEWALK BARRICADE	5.15
	DATE: _____	



STREET

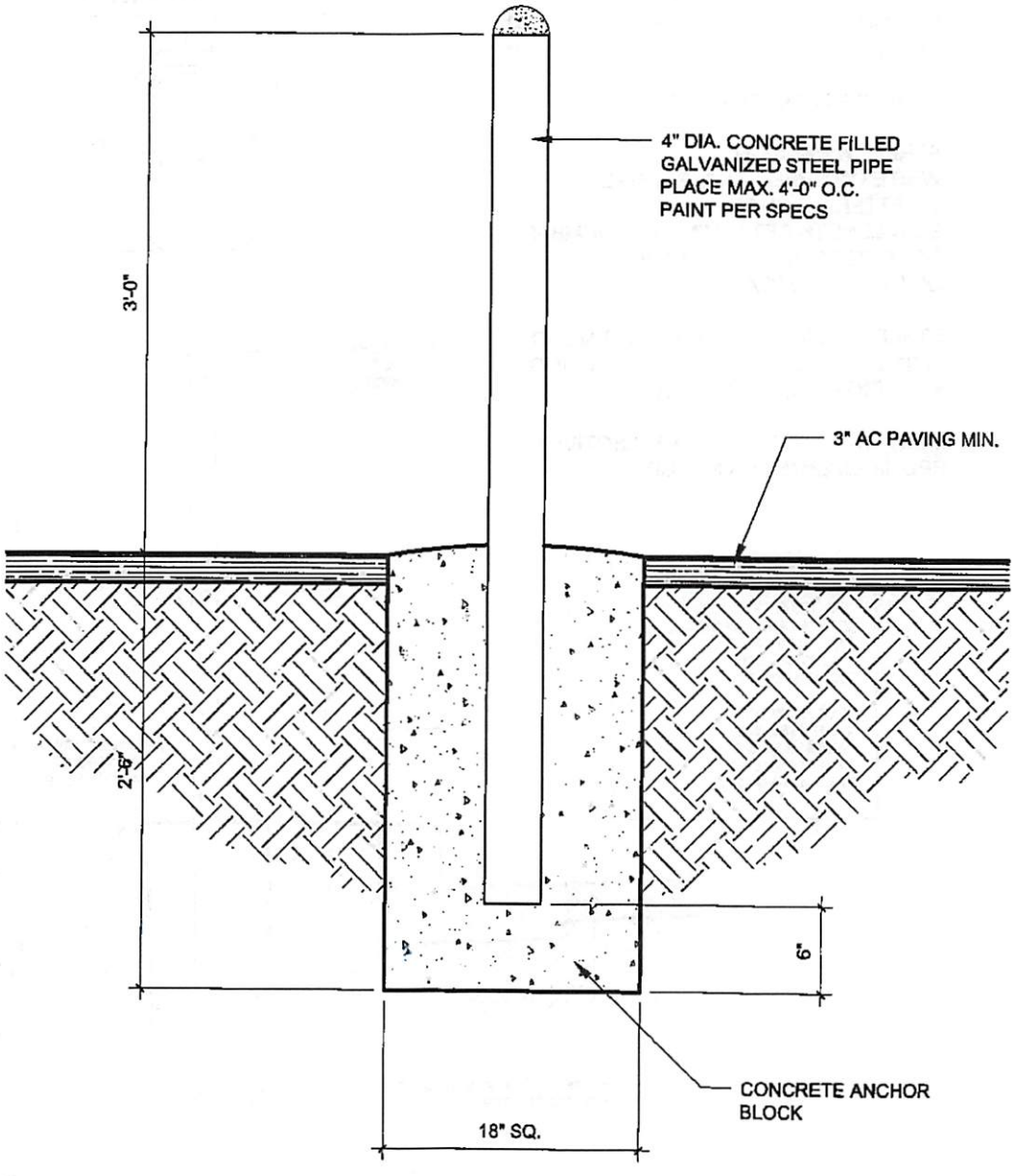


ASSEMBLY DETAIL



SECTION

CITY OF BROOKINGS - STANDARD DETAIL	5.16
GUARD RAIL BARRIER	
DATE: _____	



CITY OF BROOKINGS - STANDARD DETAIL

GUARD POST

DATE: _____

5.18

ALL SIGNS ARE TO BE DIAMOND GRADE, REFLECTIVE SHEATHING. STREET NAME SIGNS ARE TO BE EXTRUDED DOUBLE SIDED.

NO PARKING THIS SIDE OF STREET
RED ON WHITE BACKGROUND
12" x 18"

STOP SIGN STANDARD 24" x 24"

STREET NAME SIGN
WHITE ON GREEN BACKGROUND
4" LETTERING ON 6"
SIGN-LENGTH DETERMINED BY NUMBER OF LETTERS IN STREET NAME
ON EXTRUDED BLADE

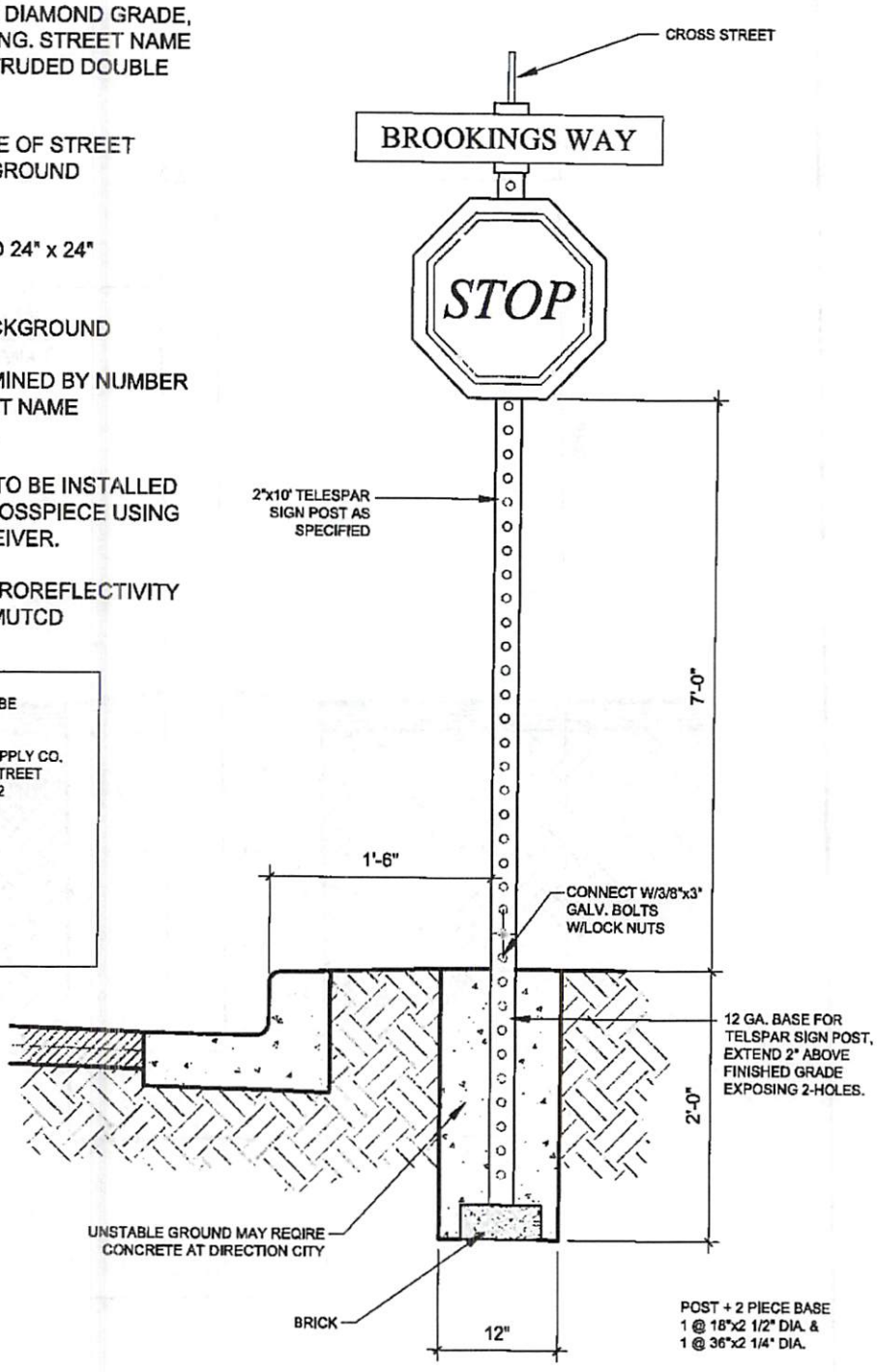
STREET NAME SIGNS TO BE INSTALLED W/2" CAP, AND 90Ø CROSSPIECE USING 5 1/4" EXTRUDED RECEIVER.

MUST COMPLY W/ RETROREFLECTIVITY REQUIREMENTS PER MUTCD

STREET SIGNS CAN BE ORDERED FROM:

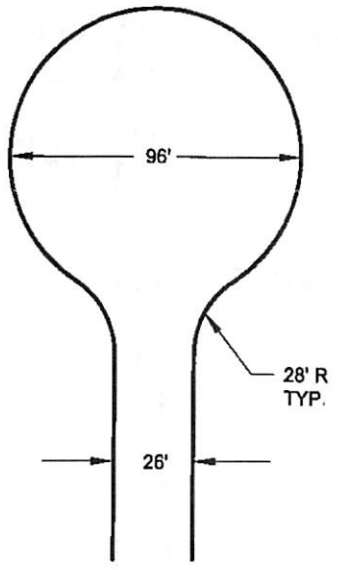
TRAFFIC SAFETY SUPPLY CO.
2324 SE UMATILLA STREET
PORTLAND OR. 97202
PH (503) 235-8531
FAX (503) 235- 5112

LYLE SIGNS, INC.
115 17TH ST. SW.
JAMESTOWN, N.D.
1-877-895-8816
FAX 701-252-9472

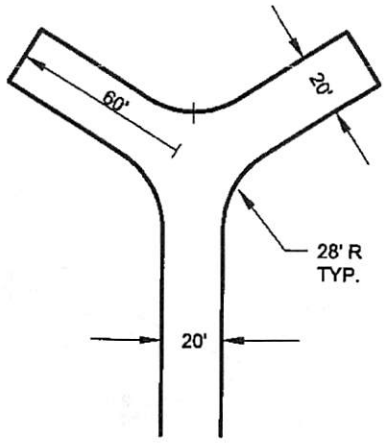


NOTE:
1. NEW PROJECTS REQUIRE EXTRA SET OF STREET SIGNS FOR PUBLIC WORKS
2. ALL HOLES & BOTTOM OF TELSPAR POST BASE MUST BE TAPED OFF TO PREVENT CONCRETE FROM BLOCKING HOLES.

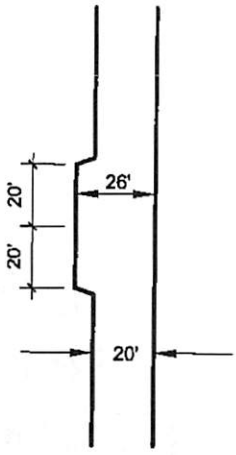
	CITY OF BROOKINGS - STANDARD DETAIL	
	SIGN POST INSTALLATION	5.20
	DATE: _____	



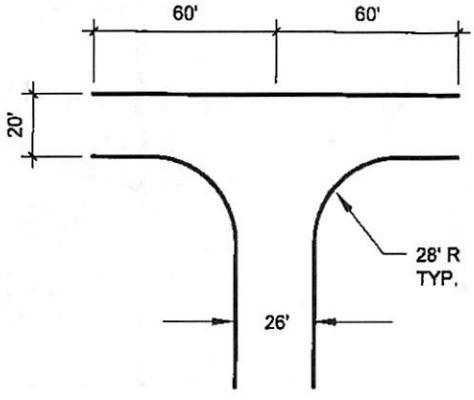
96' DIAMETER
CUL DE SAC



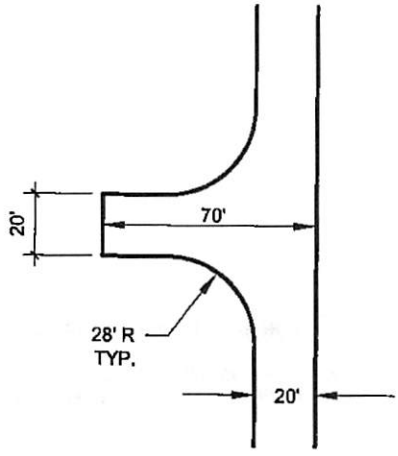
60' "Y"



MIN. CLEARANCE
AROUND A FIRE
HYDRANT



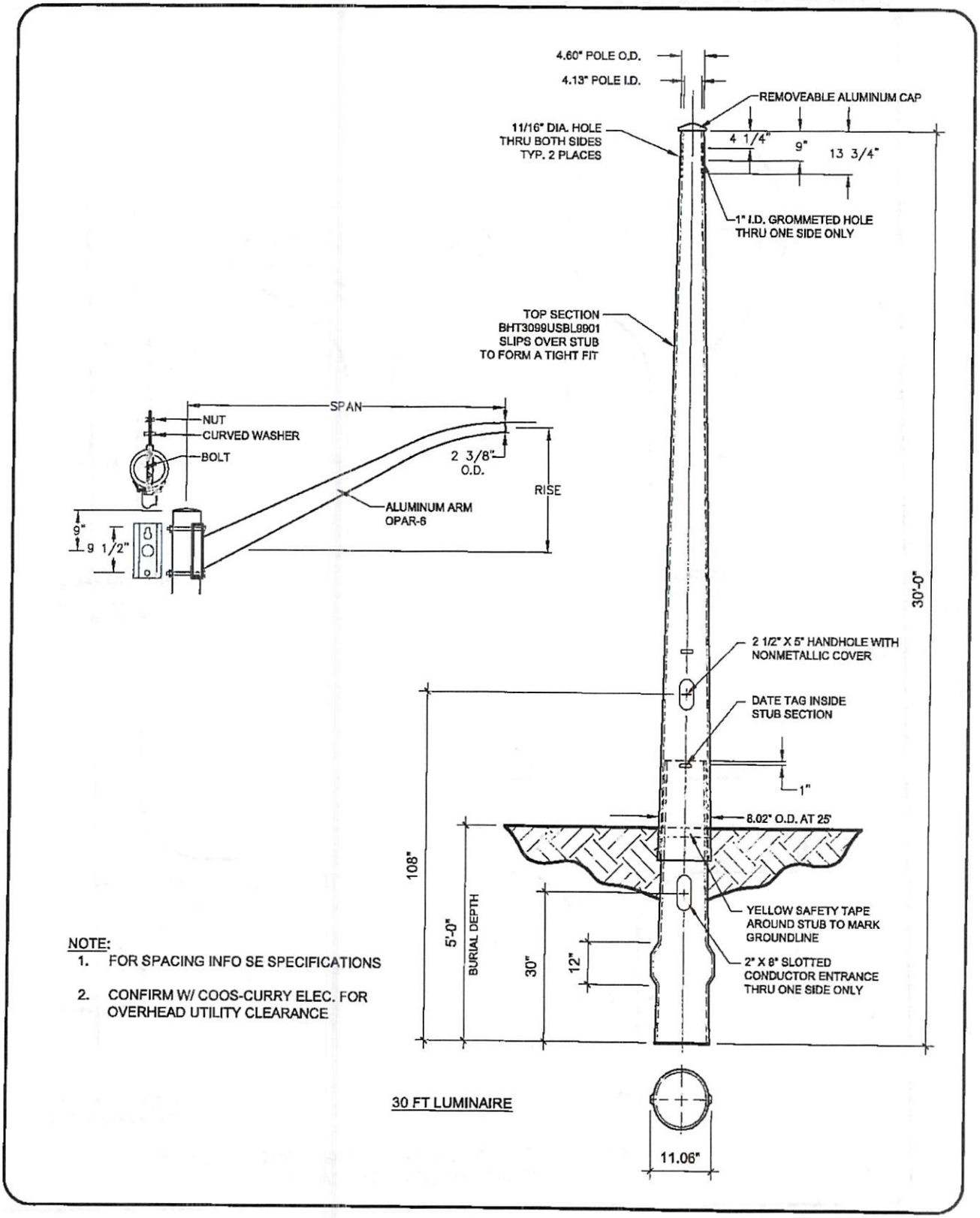
120' HAMMERHEAD



ACCEPTABLE ALT.
TO 120' HAMMERHEAD

MINIMUM FOR ACCESS - ACTUAL DESIGN WIDTH BASED ON
STREET DESIGN STANDARDS

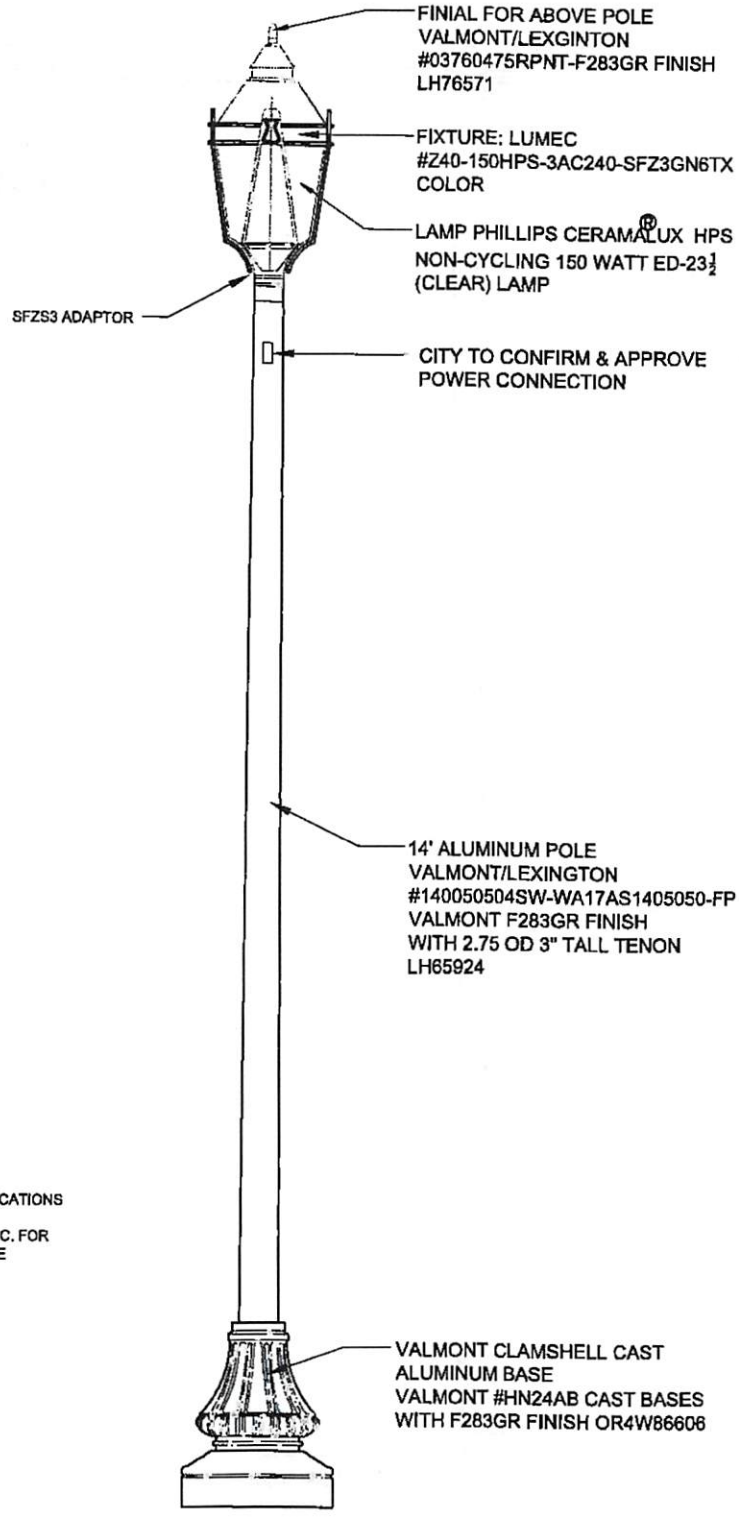
	CITY OF BROOKINGS - STANDARD DETAIL	
	FIRE ACCESS TURN AROUND	5.25
	DATE: _____	



NOTE:
1. FOR SPACING INFO SE SPECIFICATIONS
2. CONFIRM W/ COOS-CURRY ELEC. FOR OVERHEAD UTILITY CLEARANCE

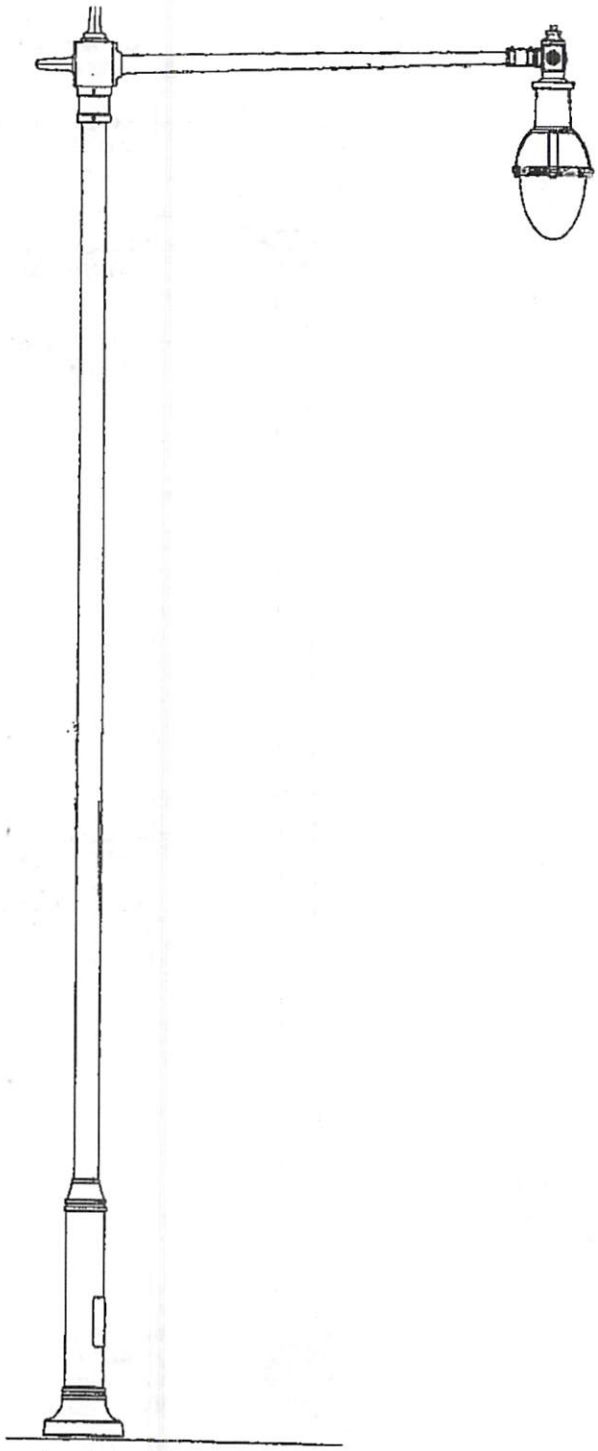
30 FT LUMINAIRE

	CITY OF BROOKINGS - STANDARD DETAIL	
	STANDARD STREET LIGHT	5.30
	DATE: _____	



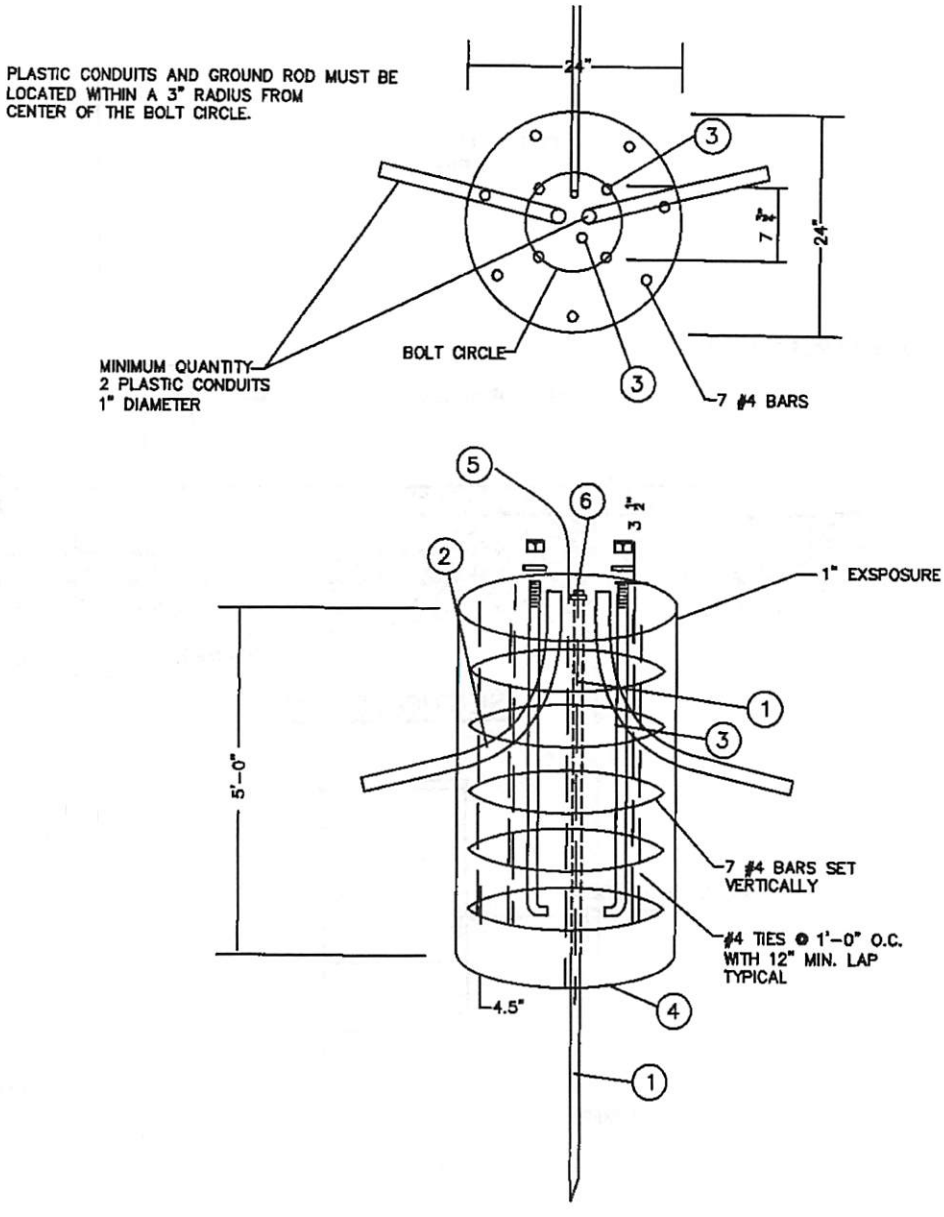
NOTE:
1. FOR SPACING INFO SE SPECIFICATIONS
2. CONFIRM W/ COOS-CURRY ELEC. FOR OVERHEAD UTILITY CLEARANCE

CITY OF BROOKINGS - STANDARD DETAIL	
DOWNTOWN DECORATIVE STREET LIGHT TYPE 1	**5.31**
DATE: _____	



Luminaire: RN20-THA3-SMA

	CITY OF BROOKINGS - STANDARD DETAIL	
	DOWNTOWN DECORATIVE STREET LIGHT TYPE 2	5.32
	DATE: _____	



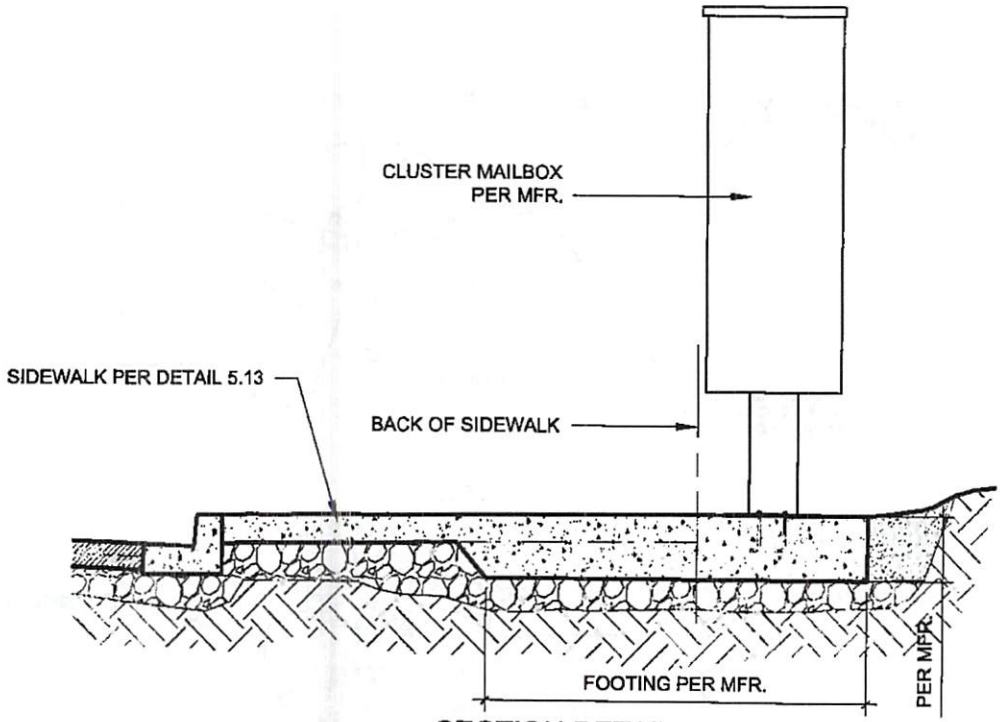
NO.	DESCRIPTION
1	ROD, GROUND, 5/8" X 8'
2	CONDUIT, FLEXIBLE, 1"
3	BOLT, ANCHOR, 1" X 36" WITH 4" HOOK, GALVANIZED
4	CONCRETE, 5 BAG MIX - 3000 PSI
5	CONDUCTOR, SEE PLANS
6	GROUND ROD CLAMP

CITY OF BROOKINGS - STANDARD DETAIL

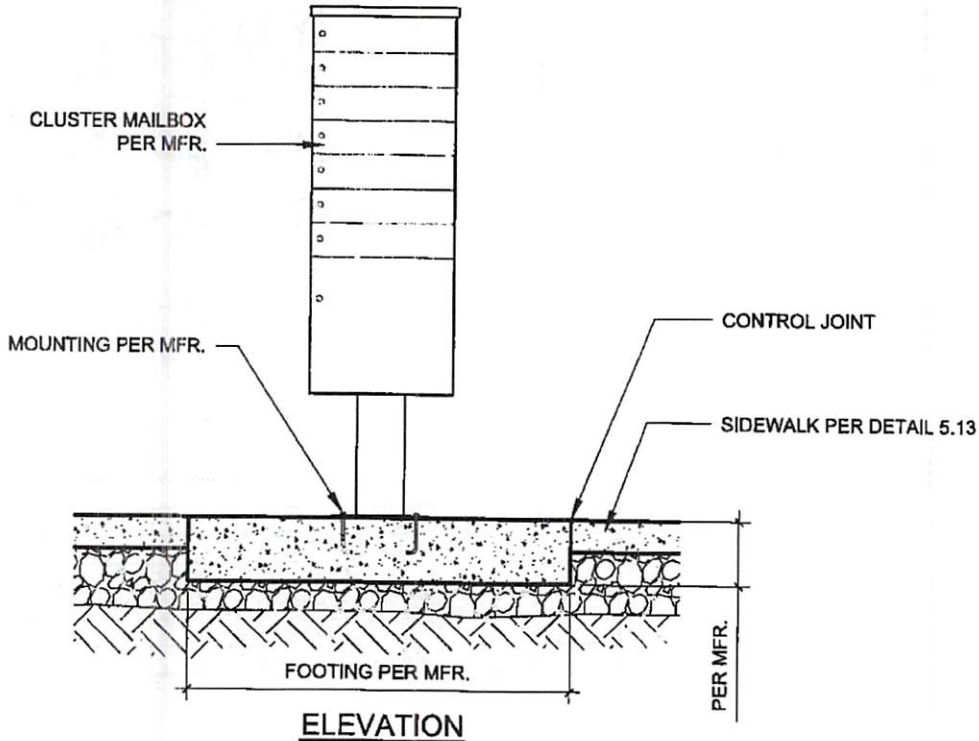
LUMINAIRE BASE

DATE: _____

5.33

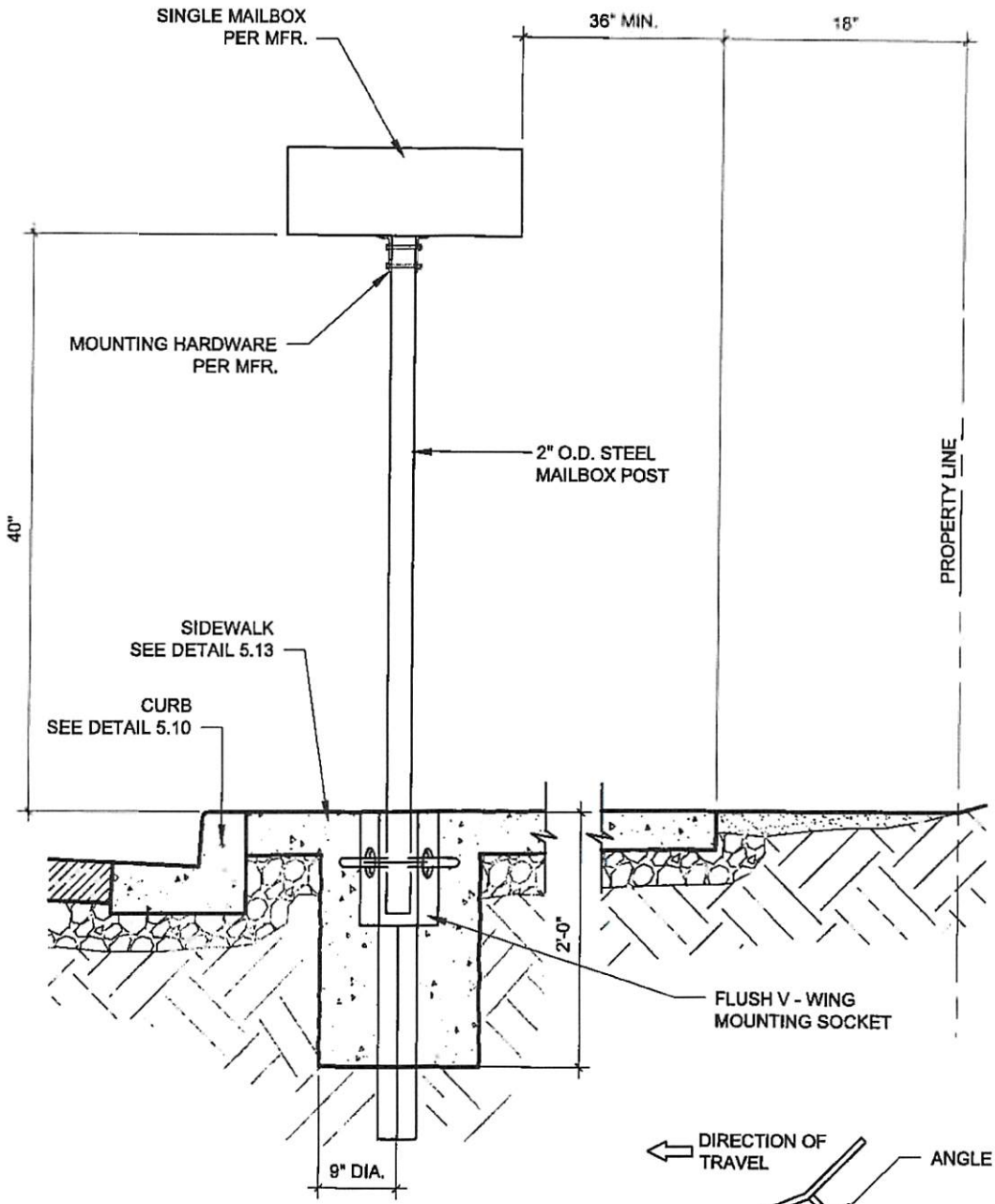


SECTION DETAIL



ELEVATION

	CITY OF BROOKINGS - STANDARD DETAIL	5.34
	CLUSTER MAILBOX DETAIL	
	DATE: _____	



CITY OF BROOKINGS - STANDARD DETAIL	
SINGLE MAILBOX DETAIL	5.35
DATE: _____	