



**CITY OF OTHELLO**

# **PUBLIC WORKS DESIGN STANDARDS**

FEBRUARY, 2018

**CITY OF OTHELLO**

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## FOREWORD

The Mayor and Council of the City of Othello welcome you to work in a community dedicated to maintaining a quality environment.

Othello's staff will work with you to create first class additions to our city. As staff, we believe that the best way to help you through this process is to meet with you prior to the development of plans and details.

This document, together with the Othello Municipal Code (OMC), will provide you with our standards. We feel that many of your questions will be answered here. These standards are intended to apply to all projects in the City of Othello Growth Management Area.

We attempt to achieve maximum uniformity of planning, engineering, and construction practices within the City of Othello. These are minimum standards and are intended to assist, but not to substitute for competent work by engineering and design professionals. Special conditions or environmental constraints may require a more stringent design than would normally be required under these standards. A proposed design, which is different than these Development standards, will be considered on the basis that the proposed design will produce a comparable or superior result and in every way adequate for the user, the City, and the public.

This document may contain minor errors, discrepancies or omissions that, with your input, will be corrected in future updates.

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# SECTION 1

## 1. INTRODUCTION

This document is to guide the developer, utility company, city contractors, and city crews when performing underground work that involves public rights-of-way.

These standards shall apply to all work within existing or proposed public rights-of-way and/or public easements. These standards are intended as guidelines for designers and developers in preparing their plans and for the City in reviewing plans. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used where practical. The developer/proponent is however cautioned that higher standards and/or additional studies and/or environmental mitigation measures may, and will, in all likelihood, be imposed by the City when developing on, in, near, adjacent, or tributary to sensitive areas to include, but not be limited to, steep embankments, creeks, ponds, lakes, certain wildlife habitat, unstable soils, high water tables, wet areas, etc.

Alternate design standards may be accepted when it can be shown, to the satisfaction of the City that such alternate standards will provide a design superior to that specified. In evaluating the alternate design, the City shall consider appearance, durability, ease of maintenance, public safety and other appropriate factors, including:

- Washington State Department of Transportation Standard Specifications for Road, Bridge & Municipal Construction, latest edition;
- Washington State Department of Ecology Criteria for Sewage Works Design, latest edition;
- Washington State Department of Health Water System Design Manual, latest edition;
- Manual on Uniform Traffic Control Devices, latest edition;

Where improvements are not covered by these details or referenced standards, the City will be the sole judge in establishing appropriate standards.

Plans for improvements within the public right-of-way or public easements shall bear an approval signature from the City.

The designer shall submit calculations or other appropriate materials supporting the design of utilities, pavements, concrete, structures and storm drainage facilities.

Where these “Standards” conflict with any existing City ordinances or discrepancies exist within the body of this text the higher “Standards” shall be utilized as determined by the Public Works Director.

Definitions: As used herein:

- (a) "Developer" means the party requesting certain improvements to become a part of the City's utility and/or roadway system upon completion and acceptance. The term shall also include the Developer's contractor and engineer. Developer improvements within public rights-of-way are normally dedicated to the City or landowner association.
- (b) "Plans" mean drawings, including reproductions thereof, of the work to be prepared by a Professional Engineer licensed in the State of Washington for the performance of the work and for the quantity and quality of materials, as contained or referenced herein.
- (c) "Specifications" means the directions, provisions, and requirements designated by a Professional Engineer licensed in the State of Washington for the performance of the work and for the quantity and quality of materials, as contained or referenced herein.
- (d) "Performance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the work will be completed in accordance with the plans and specifications.
- (e) "Utility" means a public or private utility company occupying the public right-of-way with physical improvements below or above ground that will not be dedicated to the public.
- (f) "Maintenance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the Developer will repair any defects found in the work within the time period as further identified herein.

Developer/Utility to be Informed: It is the Developer's responsibility to be fully informed regarding the nature, quality, and the extent of the developer's obligation and work to be done, and, if in doubt, to secure specific written clarification from the City.

Authority of the Public Works Director: The Public Works Director using this document shall have the authority to determine the amount, quality, acceptability and fitness of the work, material and equipment and to decide all questions relative to the fulfillment of this document, and to reject all work or material which does not conform to the terms of this document. The Public Works Director's decision in all matters is the decision of the City. The developers appeal to such decisions is to the hearing examiner.

The City of Othello and the Public Works Director, or his authorized representative, does not purport to be a safety expert, is not so engaged in that capacity and has neither the authority nor the responsibility to enforce construction safety laws, rules, regulations or

procedures, or to order the stoppage of work for claimed violations thereof. The furnishing by the City of resident project representation and/or inspection shall not be construed by the Contractor or Developer that the City is responsible for the identification or enforcement of such laws, rules or regulations.

Payment for City Services: The Developer/Utility shall be responsible for promptly reimbursing the City for all costs and expenses incurred by the City in the pursuit of project submittal, review, approval, and construction. These costs include, but are not limited to, the utilization of staff and consultants as may be necessitated to adequately review and inspect construction of the project(s). All legal, administrative, and engineering fees for project review, meetings, approvals, site visits, construction inspection, etc., shall be subject to prompt reimbursement. The Developer is cautioned that project approval (City acceptance) and occupancy permits will be denied until all bills are paid in full. The developers appeal to payment demands is to the hearing examiner.

As a condition precedent to the City accepting the completed improvements, the Developer shall construct the proposed water/sanitary/storm and roadway system, or additions thereto, in conformance with this document and its reference documents. An appeal to a rejection of work shall be to the hearing examiner.

## SECTION 2

### 2. PERMITS

#### 2.01 Permit Process

The construction of any infrastructure items or additions thereto, shall not commence until the following conditions have been fulfilled:

- a. The Developer shall have the preliminary plat approved in accordance with Chapter 16 of the OMC.
- b. The Developer shall submit detailed construction plans of the proposed improvements/utility.
- c. The Developer shall submit the plat drawings conforming to the conditions of preliminary plat approval showing all rights-of-way and easements to be dedicated to the City.
- d. Written approval from all regulatory agencies including SEPA mitigation approval shall be submitted.
- e. All contractors and subcontractors shall have a current Washington State Contractors License and a City Business License on file with the City.
- f. All Insurance and Bonding is in place as required by the City.
- g. Any financial involvement from the City shall be determined and agreed upon.
- h. The above documents shall require the review and approval by the City and its Engineer, and the cost of such review shall be at the Developer's own expense.

Should a Developer split any proposed development into more than one phase, the Developer shall submit street and infrastructure plans for all phases of the proposed development to the City in order to receive approval from the City to begin work on the first phase of the development.

The Developer's proposed improvements, or additions thereto, shall not be connected to the City system until authorized by the City, and such connection shall be performed only under the supervision and approval of the City.

For the purpose of applying RCW 4.24.115 to this Contract, the Developer and the City agree that the term "damages" applies only to the finding in a judicial proceeding and is exclusive of third party claims for damages preliminary thereto.

In requesting a permit to work in public right-of-way, the Developer/utility agrees to indemnify and hold harmless the City from all claims for damages by third parties, including costs and reasonable attorney's fees in the defense of claims for damages, arising from performance of the Developer's express or implied obligations under this Agreement. The Developer waives any right of contribution against the City.

No person, firm or corporation shall commence work on the construction, alteration or repair of any facility located either in the public right-of-way or a public easement without

the necessary permit(s) first having been obtained from the City.

Any party requesting such permit shall file written application therefore with the City at least 20 working days before construction is proposed to start. Such application shall include:

- (1) The name and address and phone number of the applicant (name and address of property owner if different than applicant) and applicant's contractor.
- (2) The name and address of the owner of the property abutting the street where the work is proposed;
- (3) The street location of the proposed work, giving the street address or legal description of the property involved;
- (4) A detailed plan showing the dimensions of the abutting properties and the dimensions and location of all existing and/or proposed facilities and other pertinent features to understand the proposed work;
- (5) The plan shall also show the location of buildings, loading platforms, roof overhangs (if significant) or off-street parking facilities in the vicinity of the new construction.
- (6) Any other information requested by the City which is necessary to properly enforce the provisions of this ordinance.
- (7) Schedule of any closing or rerouting of the public around the construction.

No permit shall be issued until the proposed work has been approved by the Public Works Director. Adjudication of disagreements regarding approvals shall be made by the Hearing Examiner.

No plan shall be approved nor a permit issued where it appears that the proposed work, or any part thereof, conflicts with the provisions of this ordinance or any other ordinance of the City of Othello, nor shall issuance of a permit be construed as a waiver of any ordinance requirements concerning the plan. Any permit issued in error shall be null and void. The fee for right-of-way permits shall be as established by in Chapter \_\_\_\_\_ of the OMC.

## **2.02 Variances**

### **A. General**

Variances to these Standards may be granted by the Public Works Director, in the exercise or reasonable judgement, upon evidence that such design variance is in the public's best interest to include satisfying requirements for safety, function, appearance, maintenance, code compliance in conformance with the intent of these

Standards.

To gain approval for a variance from these Design Standards, the Applicant shall submit a "Request for Design Variance" to the Public Works Department. The Design Variance shall state the standard(s) to be varied, including the proposed variance(s) and the reason(s) for the request. Additional supporting information, plans or design data prepared by a professional engineer, licensed in the State of Washington should be included as needed or requested.

Design variances should be approved prior to construction. To the extent known, the variance should be proposed at the preliminary design stage and include for consideration during plan review and public hearing.

Attachment 1 contain the Design Variance Application.

Should the Public Works Director prefer to refer variance decision to the City Council, the Council shall sit, in judgment of same, at a public hearing duly called in accordance with the procedures specified below. No application for a variance shall be granted by the Council unless the Council finds:

- (1) That special conditions and circumstances exist which are peculiar to the land such as size, shape, topography or location, not applicable to other lands in the same neighborhood, and that literal interpretation of the provisions of this ordinance would deprive the property owner of rights commonly enjoyed by other properties similarly situated in the same neighborhood.
- (2) That the special conditions and circumstances do not result from the actions of the applicant, or previous landowners, and are not self-imposed hardships;
- (3) That granting the variance requested will not confer a special privilege to the subject property that is denied other lands in the same neighborhood;
- (4) That the granting of the variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the neighborhood in which the subject property is situated; or is in violation of state standards.
- (5) That the granting of the variance requested will be in harmony with the general purpose and intent of these standards, and any applicable Land Use Ordinance(s);
- (6) That the purpose of the variance is not merely to permit the subject property to be utilized more profitably by the owner or to economize on the cost of improving the property.

B. Conditions

In granting any variance the City Council may prescribe appropriate conditions and safeguards that will ensure that the purpose and intent of the specifications shall not be violated. Further, the City Council will require the applicant to post a performance bond guaranteeing compliance with such conditions.

C. Appeal

An aggrieved party may file an appeal of such decision to the Adams County Superior Court within a ten-day period; if no such appeal is filed, the decision shall thereupon become final.

D. Procedure for Application of a Variance

Application for a variance shall be filed as required in OMC Chapter 16.40.

**Attachment 1 Request for Design Variance**

Project Name:

Date:

List the below the deviations from the City of Othello Design Standards you are proposing. For each variance requested, explain the reasons why City Design Standards cannot be met, and describe how the proposed variance will satisfy requirements for safety, function, fire protection, appearance and maintainability. Attach additional supporting information as needed.


Submitted by – (please print):

Company:

Signature:

**FOR CITY USE ONLY**

Approved

Denied

### **2.03 Project Coordination**

Prior to the start of construction, the Applicant will conduct a pre-construction conference. This conference shall include, but is not limited to the following:

- a. Presentation and review of project schedule specifically identifying potential water outages, traffic impacts, connections to existing City utilities, and any other City related task.
- b. Identify a Construction Contact: the person responsible for managing the day-to-day operations of the project including traffic control, inspection coordination, erosion control, project safety, and the overall coordination.
- c. Identification of potential and proposed material variances.
- d. Hold Harmless Clause per 3.02 of the Public Works Design Standards (PWDS)
- e. Proof of insurance per 3.03 of the PWDS

### **2.04 Changes During Construction**

1. Changes during construction that potentially affect the scope of the project and/or the accepted individual lot plans must be submitted to the Engineer of Record for review and approval.
2. When changes to the design are necessary, Applicant shall be responsible for coordinating the proposed design changes with the Engineer of Record. The Engineer of Record shall forward the proposed plan change, together with related calculations, to the City's Public Works Department for review and acceptance prior to construction.

## SECTION 3

### 3. INSURANCE, LIABILITY, AND BOND

#### 3.01 Bonding

Developers/utilities and their and contractors performing work within the public right-of-way or publicly owned easement(s) shall be prepared to satisfy the following two bonding requirements.

- (a) Furnishing a performance bond, approved as to surety by the City Administrator and as to form by the City Attorney, which bond shall be conditioned upon faithful completion of that portion of the work performed pursuant to the Developer Extension Agreement which will require completion by the City should the permittee or his contractor default. The amount of such bond shall be 150% of the value of the improvements. The City Engineer shall review and provide approval of the submitted amount.
  
- (b) Furnishing a Maintenance Bond for 100% of the total construction cost. All work shall be guaranteed by the Contractor for a two-year period from the time of final written approval of the construction and the record drawings by the City. Of particular importance is a Maintenance Bond for construction involving work within the roadway right-of-way. Final approval of questionable work may require an extension of the Maintenance Bond increasing the maintenance bond one year for each foot of depth the questionable work was performed.

#### 3.02 Hold Harmless Clause

The Developer/utility shall indemnify and hold harmless the City and the City Engineer, and their agents and employees, from and against all claims damages, losses, and expenses, including attorney's fees, arising out of or resulting from the performance of the work, and shall, after reasonable notice, defend and pay the expense of defending any suit and will pay any judgment, provided that any such claim, damage, loss, or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury or destruction of tangible property (other than the work itself), including the loss of use resulting there from, and (2) is caused in whole or in part by any negligent act or omission or by any other action giving rise to strict liability of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

In any and all claims against the City or City Engineer, or any of their agents or employees, by any employee of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this article shall not be limited in any way by any

limitation on the amount or type of damages, compensation, or under workman's compensation acts, disability benefit acts, or other employee's benefit acts.

### **3.03 Developer's Public Liability & Property Damage Insurance**

The Developer shall not commence work until he has furnished evidence (in duplicate copy) of insurance required hereunder, and such insurance has been approved by the City Attorney; nor shall the Developer allow any contractor or subcontractor to commence work on his contract or subcontract until the same insurance requirements have been complied with by such contractor or subcontractor. Approval of the insurance by the City Attorney shall not relieve or decrease the liability of the Developer thereby.

Companies writing the insurance under this article shall be licensed to do business in the State of Washington or be permitted to do business under the Surplus Line Law of the State of Washington.

The Developer shall maintain, during the life of the Contract, Comprehensive General and Automobile Liability Insurance, as detailed herein. The insurance shall include, as Additional Named Insured, the City. All insurance policies shall be endorsed to provide that the policy shall not be canceled or reduced in coverage until after 10 days' prior written notice, as evidenced by return receipt of registered letter has been given to the City.

Comprehensive General Bodily Injury and Property Damage Insurance shall include:

- a. Premises & Operations;
- b. Developer's Protective Liability;
- c. Products Liability, including Completed Operations Coverage
- d. Contractual Liability
- e. Broad Form Property Damage;

Comprehensive Automobile Bodily Injury and Property Damage Insurance shall include:

- a. All owned automobiles;
- b. Non-owned automobiles;
- c. Hired automobiles.

The insurance coverages listed above shall protect the Developer from claims for damages for bodily injury, including death resulting there from, as well as claims for property damage, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly employed by either of them, it being understood that it is the Developer's obligation to enforce the requirements of this article as respects any contractor or subcontractor.

Comprehensive General and Automobile Liability Insurance shall provide coverage for both bodily injury and property damage, as follows:

Comprehensive General and Automobile Bodily Injury Liability Insurance on an

occurrence basis of not less than One Million dollars (\$1,000,000.00) for bodily injury, sickness or disease, including death resulting there from, sustained by each person; and for limits of not less than One Million Dollars (\$1,000,000.00) for each occurrence.

Comprehensive General Property Damage Liability Insurance on an occurrence as is for limits of not less than One Million Dollars (\$1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence, and in an amount of not less than Two Million Dollars (\$2,000,000.00) in aggregate.

Comprehensive Automobile Property Damage Liability Insurance on an occurrence basis for limits of not less than One Million Dollars (\$1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence. Comprehensive Liability Insurance shall include the City and the as Additional Named Insured.

Comprehensive General Property Damage Liability Insurance shall include liability coverage for damage to or destruction of property of other, including loss of use of property damaged or destroyed, and all other indirect and consequential damage for which liability exists in connection with such damage to or destruction of property of others, and shall include coverage for:

("X") Injury to or destruction of any property arising out of blasting or explosion;

("C") Injury to or destruction of any property arising out of the collapse of/or structural injury to any building or structure due:

- (1) To excavation, including borrowing, filling or backfilling in connection therewith, or tunneling, pile driving, coffer-dam work or caisson work, or
- (2) To moving, shoring, underpinning, raising or demolition of any building or structure or removal or rebuilding of any structural support thereof.

("U") Injury to or destruction of wires, conduits, pipes, mains, sewers or other similar property or any apparatus in connection therewith, below the surface of the ground, if such injury or destruction is caused by and occurs during the use of mechanical equipment for the purpose of excavating or drilling, or

Injury to or destruction of property at any time resulting there from.

There shall be included in the liability insurance, contractual coverage sufficiently broad to insure the provisions of "Hold Harmless Clause".

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Developer's responsibility for payment of damages resulting from his operations under this Contract.

In the event the Developer is required to make corrections on the premises after the work has been inspected and accepted, he shall obtain, at his own expense, and prior to commencement of any corrective work, full insurance coverage, as specified herein. The Developer shall furnish, upon request by the City, certified copies of the insurance policy or policies within two weeks of the City's request.

### **3.04 Compensation & Employer's Liability Insurance**

The Developer shall maintain Workmen's Compensation Insurance or, as may be applicable, Maritime Workmen's Insurance, as required by state or federal statute for all of his employees to be engaged in work on the Project and, in case any such work is sublet, the Developer shall require the contractor or subcontractor similarly to provide Workmen's Compensation Insurance or Maritime Workmen's Insurance for all of the latter's employees to be engaged in such work. The Developer's Labor & Industries account number shall be noted in the Proposal in the space provided.

In the event any class of employees engaged in work at the site of the Project is not covered under the Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state and federal statute, the Developer shall maintain and shall cause each contractor or subcontractor to maintain Employer's Liability Insurance with a private insurance company for limits of at least One Hundred Thousand Dollars (\$100,000.00), each person, and Three Hundred Thousand Dollars (\$300,000.00), each accident, and furnish satisfactory evidence of same.

### **3.05 Non-interference**

The permittee shall be responsible for minimum interference with:

- Traffic Routing
- Emergency Vehicle Access and Notification
- Adjoining Property
- Utility Facilities Natural Surface Drainage
- Pedestrian Safety

These items are to be discussed in a pre-construction meeting with the Public Works Department, Fire and Police Departments, and the Building Department, and special provisions may be included in any applicable City Permit(s). A written plan to reduce any or all of the aforementioned interferences may be required of the permittee by the City.

In the event the Developer in his operation damages or disrupts existing improvements, the repairs shall be made at the Developer's expense. In the event they are so damaged or the service disrupted and the Developer fails or is unable to immediately restore the service in a safe and secure manner, then the owners of the improvements may cause the repairs to be made by others and all costs for the same shall be at the Developer's own expense.

Where the construction crosses or is adjacent to existing utilities, the Developer shall exercise extreme care to protect such utilities from damage. If any damage is done to an existing utility, the Developer shall notify the utility company involved, who will dispatch a crew to repair the damage at the Developer's expense.

The Developer shall be aware that some existing City owned facilities are known to contain asbestos cement pipe. The Developer shall conduct all work related to existing asbestos cement pipe in strict accordance with current WISHA safety regulations and provisions contained within WAC 296-62-077. All costs related to work in compliance with established rules and regulations shall be the responsibility of the Developer. The Developer shall be responsible for all associated fees and permits required for asbestos removal and disposal.

The Developer/utility is cautioned that all utilities may not be on record. It shall be the responsibility of the Developer to repair or replace all such systems found during construction, which are damaged by the Developer's construction in a manner, which is satisfactory to the City.

Where the Developer is permitted to use or impact private property adjacent to the work, the property so impacted shall be returned to its original or superior condition. The Developer shall make all arrangements in advance with such property owners, to insure that no conflicts will ensue after the property is restored as described above. The Developer will be required to furnish the City with a written release from said private property owners, if the City deems it to be necessary to obtain such document.

### **3.06 Work Safety**

All work performed pursuant to a permit issued shall be done in accordance with job site safety and trench shoring requirements, in accordance with the Washington State Labor and Industries, shall be the full responsibility of the permittee.

### **3.07 Damage Claims**

It is agreed and mutually negotiated that in any and all claims against the City or any of its agents or employees by any employee of the Developer, any contractor or subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation hereunder shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Developer or any contractor or subcontractor under Workman's Compensation Acts, disability benefits acts or other employees' benefit acts. The City and the Developer agree that all third part claims for damages against the City for which the Developer's insurance carrier does not accept defense of the City may be tendered by the City by the Developer who shall, if so tendered by the City, accept and undertake to defend or settle with the Claimant. The City retains the right to approve claim investigation and counsel assigned to said claim and all investigation and legal work product regarding said claim shall be performed under a fiduciary relationship to the City. In the event that the City

agrees or a court finds that the claim arises from the sole negligence of the City, this indemnification shall be void and the City shall be responsible for all damages payable to the third-party claimant. In the event that the City and the Developer agree or a court finds that the claim arises from or includes negligence of both the Developer and the City, the Developer shall be responsible for all damages payable by the Developer to the third party claimant under the court findings, and, in addition thereto, the Developer shall hereunder indemnify the City for all damages paid or payable to the City under the court findings in an amount not to exceed the percentage of total fault attributable to the Developer. For example, where the Developer is 25% negligent, the Developer shall not be required to indemnify the City for any amount in excess of 25% of the claimant's total damages.

# SECTION 4

## **4. INSPECTION, TESTING, WARRANTY, AND ACCEPTANCE**

### **4.01 General**

The Developer/utility herewith agrees to allow inspections and agrees to cooperate providing reasonable advance notice on his construction schedule during the various construction phases. The Developer/utility further agrees to reimburse the City for all engineering fees and inspection expenses incurred by the City for such supervision.

The City shall exercise full right of inspection of all excavating, construction, and other invasions of City right-of-way or public easements. The Public Works Director or otherwise directed City representative shall be notified on the working day prior to commencing any work in the City's right-of-way or public easements.

No work shall take place on weekends or holidays without approval from the Public Works Director. The City will have an inspector on site for any weekend or holiday work.

The Public Works Director and/or his authorized representative is authorized to and may issue immediate stop work orders in the event of noncompliance with this chapter and/or any of the terms and provisions of the permit or permits issued hereunder.

### **4.02 Project Acceptance of Completed Construction**

A. The Contractor shall complete all items required for a complete project before requesting the City to perform a final inspection. For a complete project, all appurtenances shall be installed; all utilities shall be adjusted; all Portland Cement Concrete and HMA shall be placed; all backfilling shall be completed; and the entire project shall be debris free and washed, swept, or vacuumed as necessary to provide a project that is readily inspectable.

B. Once the project is prepared for final inspection the Contractor shall notify the City, in writing, accompanying the request for final inspection shall be a colored copy of the As-built Drawings. The City will make a visual inspection of the job site and a written report prepared. Final written approval of construction shall not be given earlier than 30 days after satisfactory completion of construction, as witnessed by the City, and the submission of Working Drawings, and applicable material testing documentation as outlined in Attachment 2.

### **4.03 As-Built (Record) Drawings**

As-built drawings shall be submitted on permanent, stable reproducible Mylar with a signature and data which verifies the "as-built" condition of the project. All data as shown

on the drawings shall be "fixed line" or ink. Sticky back (glue) reproductions or "sepia" Mylars shall not be considered acceptable. The number of sets of Mylar drawings shall be in accordance with the Othello Municipal Code. An AutoCAD version of the as-built drawings will also be required.

#### **4.04 Changes During Inspection**

1. Changes during construction that materially affect the scope of the project and/or the accepted individual lot plans must be submitted for review by the City. Minor changes do not need to be reviewed by the City, but must be documented by the Project Coordinator and included in the Working Drawings.
2. When changes to the design are necessary, Applicant shall be responsible for coordinating the proposed design changes with the Project Engineer. The Project Engineer shall forward the proposed plan change, together with related calculations, to the City's Public Works Department for review and acceptance prior to construction.

#### **4.05 Warrantee**

The minimum two-year warrantee of the Developer's improvements shall begin when the same has been fully inspected and approved, and the following requirements have been performed:

- a. The final plat has been filed with Adams County.
- b. Submit to the City "fixed line" Mylars with all changes from the original design clearly marked to reflect the as-built conditions. The Developer's Engineer shall certify the accuracy of the record drawings.
- c. Payment of all permit fees, bills, invoices, mitigation payments, equivalent assessment charges, plan check and inspection fees, any other applicable development approval fees required for the project Premises.
- d. Payment of all related and/or necessary recording fees.
- e. Prepare and furnish the required easements, covenants, contracts, etc. in accordance with City's standard form, and furnish the same to the City for approval by the City Attorney.
- f. Furnish the City with an affidavit warranting there are no liens against the improvements constructed on Premises by the Developers; this affidavit shall be in the form prescribed by the City.
- g. Furnish the City with a dedication conveying the water/sanitary/storm or roadway system to the City at the end of the warrantee period.

- h. Provide a two-year guarantee that the conveyed systems or improvements or additions thereto shall be free of defects in labor and materials. Form shall be as prescribed by the City.

In the event any warranty repairs are required, the City agrees, whenever feasible, to provide the Developer with reasonable notice before directly undertaking such repairs. The City reserves the right, however, to effect emergency repairs as deemed necessary by the City. The City shall be reimbursed by the Developer for all costs thereof.

Upon performing all requirements and conditions of the preliminary plat and these Standards, the City shall accept the water/sanitary/storm and/or roadway improvements and dedications, and agree therewith to own, operate, and maintain said system.

# SECTION 5

## 5. STREETS, SIDEWALKS, AND ALLEYS

### 5.01 General

The City of Othello Street Standard Drawings are hereby supplemented with the Washington State Department of Transportation/APWA Standard Specifications for Road, Bridge, and Municipal Construction, current edition. Both standard components apply to all public facilities construction within the City. In the event of conflicting details or specifications, precedence shall be in the following order:

1. City of Othello Street Standard Drawings
2. Washington State Department of Transportation/APWA Standard Specifications for Road, Bridge, and Municipal Construction, current edition
3. City-Approved Project Plans

Project plans shall have a horizontal scale 20 feet to the inch and a vertical scale of not more than 5 feet to the inch.

### 5.02 Vertical Datum

The City of Othello has established the USBR elevation datum to be the official vertical datum to be used on all projects within the City of Othello Urban Growth Area.

All commercial/industrial projects in the area are required to have the following statement on the preliminary and final record drawings.

“VERTICAL DATUM.”

“The elevations shown on these plans are based on the elevation of the bench mark monument located at the intersection of \_\_\_\_\_ Avenue and \_\_\_\_\_ Street and checked for accuracy by closing to the elevation monument located at \_\_\_\_\_ Avenue and \_\_\_\_\_ Street, according to the City of Othello official elevation bench mark list dated \_\_\_\_\_, the records of Othello, Washington.” (Minor projects do not need to be closed.)

If the National Geodesic Vertical Datum of 1929 (NGVD-29) was used, it is converted to the USBR elevation by adding .89 feet to the NGVD-29 elevation. If North American Vertical Datum 1988 (NAVD-99) was used, it is converted to the USBR elevation by subtracting 2.8 feet from the NAVD.

### 5.03 Existing Monuments

The following official benchmarks are hereby established throughout the City.

<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ELEVATION</b>
USGS Brass Cap	38' west of railroad track, 100' south of Main Street	1038.78
USBR Brass Cap	Steps of USBR building; 7th Avenue & Main Street	1104.56
Brass Cap	Canal structure, NE corner, 14th Avenue & Main Street	1118.08
USBR Brass Cap	Section corner monument; Broadway Avenue & Lee Street	1072.56
Brass Cap	1/4 corner monument; Broadway Avenue & future Olympia St.	1073.85
Steel Rod in Concrete	Section corner monument; Broadway Avenue & Main Street	1052.50
Brass Cap	1/4 corner monument; 7th Avenue & Lee Street	1118.68
Aluminum Cap	Center 1/4 corner monument; 7th Avenue and Olympia Street	1106.43
Brass Cap	Centerline monument; 7th Avenue & Scooteny Street	1071.28
Aluminum Cap	Section corner monument; 14th Avenue & Lee Street	1126.71
USBR Brass Cap	1/4 corner monument; 14th Avenue & Olympia Street	1115.84
Brass Cap	1/4 corner monument; 14th Avenue & just south of Ash Street	1097.27

#### **5.04 New Monuments**

The materials and method of construction shall conform to the requirements specified herein and as indicated in Section 8-13 of the WSDOT Standard Specifications. The following procedure shall be followed for the placement of new monuments as well as the replacement of disturbed existing monuments:

1. The Developer's Surveyor will reference all monuments that will be removed or destroyed during construction prior to their removal or destruction. The Developer's Surveyor will complete and file all documentation required for the temporary removal of said monuments.
2. After the Contractor constructs the road, the Developer's Surveyor will set two, 2-foot long "straddles" at the monument locations designated on the Plans.
3. The Contractor shall install the new monument cases, complete with Schedule 40 galvanized steel pipes and 2-inch diameter brass caps. The monument case, cover, pipe, and brass cap will be furnished and set in concrete, and patched with HMA, by the Contractor.
4. The Developer's Surveyor will stamp the brass caps with "cross hairs," or some other such industry-accepted mark, to indicate the point that was removed is now replaced. The Developer's Surveyor will also affix his/her Washington State PLS registration number to the brass caps. The Developer's Surveyor will then file all required documentation indicating that the monument has been reestablished.

#### **5.05 Hot Mix Asphalt Placement**

The materials and method of construction shall conform to the requirements specified herein and as indicated in Section 5-04 of the most current WSDOT Standard Specifications. Asphalt binder shall be PG 64-28. (mix design for Othello area)

A copy of the HMA mix design shall be forwarded to the City for review and approval a minimum of five business days prior to the start of all paving operations.

A tack coat consisting of CSS-1 emulsified asphalt conforming to the most current WSDOT Standard Specifications Section 9-02.1(6) shall be applied to the top surface as well as all exposed edges of transverse and longitudinal joints.

All cold joints shall be sealed with Poured Rubber Joint Sealer per WSDOT Standard Specifications. After sealing, a sand blanket shall be applied on top to help alleviate tracking.

The Contractor's material suppliers shall be required to furnish certification from a certified materials testing laboratory approved by the City that the material is in conformance with these Specifications. The Contractor shall be required to test for compaction of HMA to ensure the work is done in conformance with the WSDOT Standard Specifications. The testing shall be done by a City approved materials testing laboratory.

Hot mix asphalt compaction shall meet the requirements of Section 5-04.3(10) of the most current WSDOT Standard Specifications. The Contractor shall be responsible for the control of the compaction effort.

The level of compaction attained will be determined as the average of not less than four nuclear density gauge readings taken at 90° to each other within any given three-square-foot area. The four readings shall be averaged to result in one "test" which shall be reported to the City in accordance with the WSDOT Standard Specifications. Frequency of testing shall be once test per 80 tons of HMA placed. The readings shall be taken in accordance with ASTM test methods on the day the mix is placed, and after completion of the finish rolling, at randomly selected locations within each lot for each paving course.

### **5.06 Curb, Gutters, and Spillways**

The materials and method of construction shall conform to the requirements specified herein and as indicated in Section 8-04 of the WSDOT Standard Specifications.

Any curb and gutter not acceptable, in the opinion of the City, because of damage or defacement, shall be removed and replaced by the Contractor at the Contractor's expense. Sacking or grinding shall not be considered an acceptable means for repairing unacceptable sections.

The alignment of curb and gutter shall conform to Section 6-02.3(6) of the WSDOT Standard Specifications. Curb and gutter shall not deviate more than 1/4 inch when measured by a 10-foot straightedge held longitudinally on the front face, back face, and top surface.

Concrete shall be tested in accordance with applicable portions of ACI. All concrete shall meet the specified requirements for 28-day compressive strength. The Contractor shall furnish all concrete required for testing. In cases where cylinders are stored at the project site, the Contractor shall provide storage and protection for the cylinders.

All concrete testing shall be done by a certified testing laboratory approved by the City. The frequency of testing shall be one set of cylinders per every 50 cubic yards of concrete placed.

Test reports shall be reported in writing to the City within 24 hours of each test. Test reports may be faxed within 24 hours, provided hard copies are mailed as well. All tests shall identify approximate test location by station and type of concrete placed (sidewalk, curb and gutter, approach, etc.).

### **5.07 Cement Concrete Sidewalks**

The materials and method of construction shall conform to the requirements specified herein and as indicated in Section 8-14 of the WSDOT Standard Specifications.

In accordance with Section 8-04.3 of the WSDOT Standard Specifications, commercial concrete may be used in lieu of Class 3000 concrete subject to the requirements of the WSDOT Standard Specifications Section 6-02.3(2)B. Where applicable, Class 4000 concrete shall be used for the full width of all driveway entrances and Class 4000 concrete may be used for sidewalks.

The detectable warning surface shall be constructed with cast-in-place tiles as manufactured by Armor Tile or approved equal. Glue-on style textured mats or paint will not be acceptable.

Any sidewalk not acceptable, in the opinion of the City, because of damage, defacement or deviation greater than an 1/4" over the width of the sidewalk shall be removed and replaced by the Contractor at the Contractor's expense. Sacking or grinding shall not be considered an acceptable means for repairing unacceptable sections.

After troweling and before installing the contraction joints or perimeter edging, the walking surfaces of the sidewalk and curb ramps shall be brushed in a transverse direction with a soft bristled broom to produce a fine broom finish. Course broom finishes shall not be acceptable.

Concrete shall be tested in accordance with applicable portions of ACI. All concrete shall meet the specified requirements for 28-day compressive strength. The Contractor shall furnish all concrete required for testing. In cases where cylinders are stored at the project site, the Contractor shall provide storage and protection for the cylinders.

All concrete testing shall be done by a certified testing laboratory approved by the City. The frequency of testing shall be one set of cylinders per every 50 cubic yards of concrete placed.

Test reports shall be reported in writing to the City within 24 hours of each test. Test reports may be faxed within 24 hours, provided hard copies are mailed as well. All tests shall identify approximate test location by station and type of concrete placed (sidewalk, curb and gutter, approach, etc.).

### **5.08 Inspection**

The Contractor shall request for inspection a minimum of 48 hours in writing prior to the Contractor's scheduled need. Inspection shall be required for the following items of work:

1. Subgrade preparation
2. HMA
3. Concrete

## 5.09 Street Trees

Private landscaping including grass, shrubs, bushes, and plants may be planted in the City rights-of-way and easements with permission from the Public Works Director and approved right-of-way permit.

Developments plans which include proposed street rights-of-way may include street trees. Street tree placement and planting details shall be per the City of Othello Design Standards and included in the detailed submitted plans.

Street tree plans shall include:

- 1 tree for each 25 lineal feet of street frontage or façade length or width.
- Minimum caliper size of 2 inches.
- And proposed species of the tree.

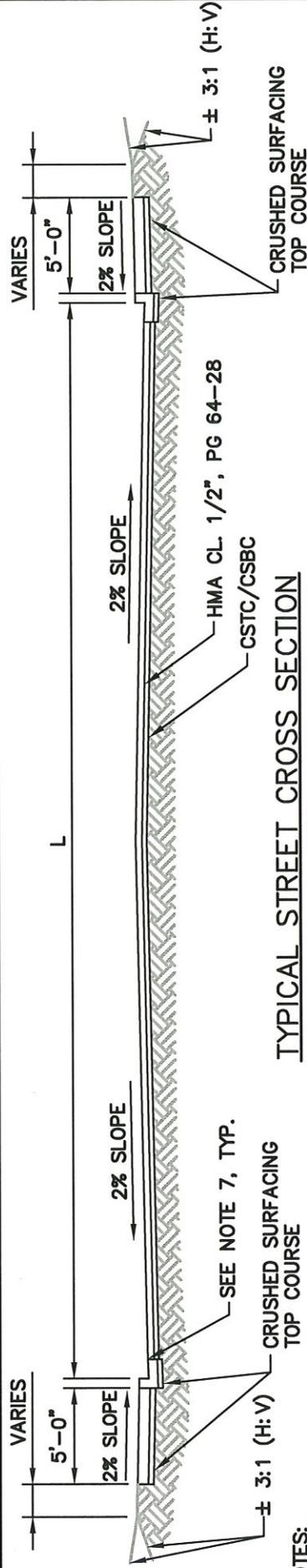
Approved trees include : Flame maple, Trident Maple, Tatarian Maple, Common Hornbeam, Zelkova, Tree Lilac, Red Sunset Maple, Kwanzan Flowering Cherry, Chanticleer Flowering Pear, Sparticus White Ash, and Littleleaf Linden.

## MINIMUM DIMENSIONS

ARTERIALS	COLLECTORS	NEIGHBORHOOD STREET
SIDEWALK (BOTH SIDES)	5 FEET	5 FEET
MIN. STREET WIDTH "L"	48 FEET	42 FEET
ASPHALT DEPTH	4 INCHES	3 INCHES
CSTC DEPTH	3 INCHES	3 INCHES
CSBC DEPTH	6 INCHES	6 INCHES
PARKING LANE (BOTH SIDES)	9 FEET	9 FEET
MIN. RADIUS (FACE OF CURB)	20 FEET	20 FEET
RIGHT OF WAY	70 FEET	66 FEET
CURVATURE (CENTERLINE)	300 FT. RADIUS	300 FT. RADIUS
MAXIMUM GRADE	8%	8%

CUL-DE-SAC: MIN. 62 FT. FROM CURB TO CURB, 80 FT. RIGHT OF WAY, 6% MAX. GRADE

NOTE: THESE ARE MINIMUM DIMENSIONS AND MAY BE INCREASED DUE TO SPECIFIC CONDITIONS, SUCH AS IN INDUSTRIAL AND COMMERCIAL AREAS, WHICH HAVE MINIMUM SIDEWALK WIDTH OF 6 FEET.



### TYPICAL STREET CROSS SECTION

NTS

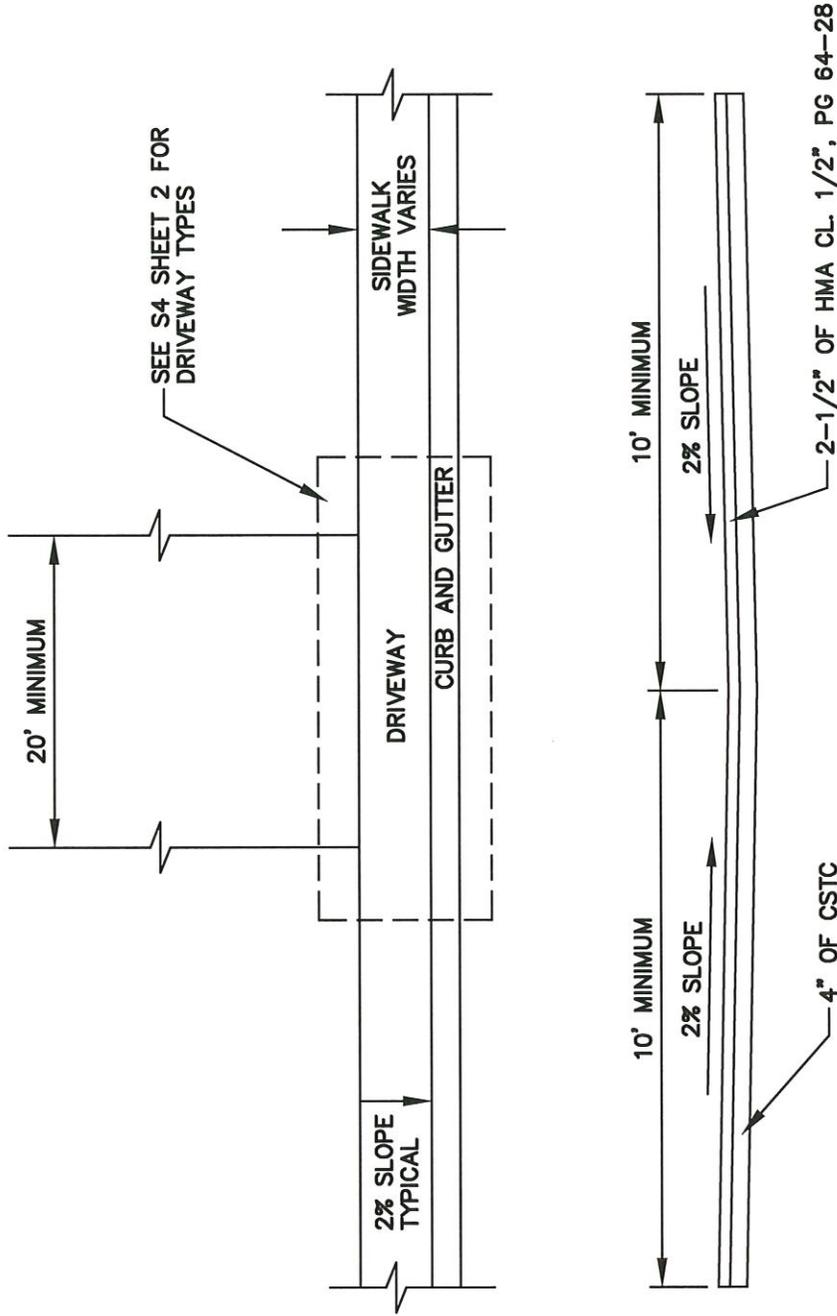
**NOTES:**

1. FOR SIDEWALK AND DRIVEWAY CONSTRUCTION SEE STANDARD DRAWINGS S4-1,2,3.
2. FOR CURB CONSTRUCTION SEE STANDARD DRAWING S3-1
3. STREETS SHALL HAVE A MINIMUM CENTERLINE SLOPE OF 0.5 PERCENT.
4. ALL DEPTHS SHOWN ARE COMPACTED DEPTHS.
5. 95% COMPACTION WILL BE REQUIRED FOR ALL CRUSHED SURFACING MATERIALS.
6. NO CUL-DE-SACS OR BUMPOUTS ALLOWED WITHOUT PRIOR APPROVAL FROM THE CITY.
7. SEAL ALL JOINTS WITH POURED RUBBER JOINT SEALER ADHERING TO WSDOT 9-04.2(2)
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.



#1	November, 2014
#2	June, 2016
#3	February, 2018
REVISION #	DATE

CITY OF OTHELLO  
STANDARD DETAILS  
MINIMUM STREET STANDARDS  
FIGURE S1-SHEET 1



**TYPICAL ALLEY CROSS SECTION**  
NTS

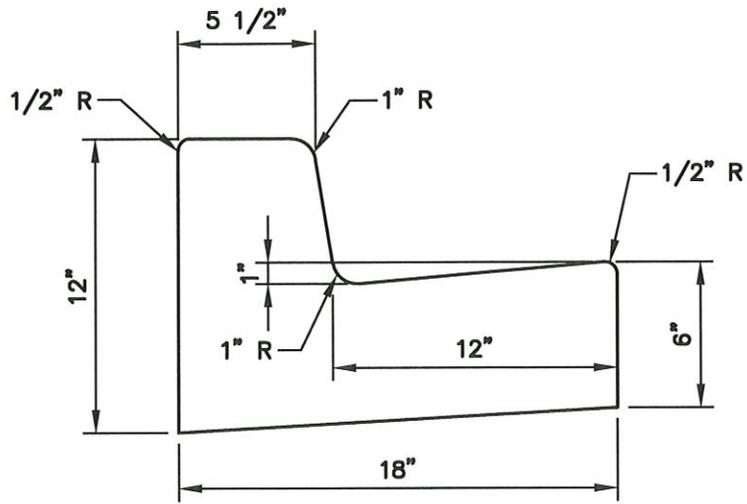
**NOTES:**

1. ALLEYS IN RESIDENTIAL AREAS SHALL BE GRADED AND HAVE 4" CSTC.
2. PAVED ALLEYS SHALL HAVE A MINIMUM CENTERLINE SLOPE OF 0.5%.
3. ALL DEPTHS SHOWN ARE COMPACTED DEPTHS.
4. COMMERCIAL ALLEYS SHALL BE 25' WIDE WITH 4" CRUSHED SURFACING TOP COURSE AND 3" HOT MIX ASPHALT.
5. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

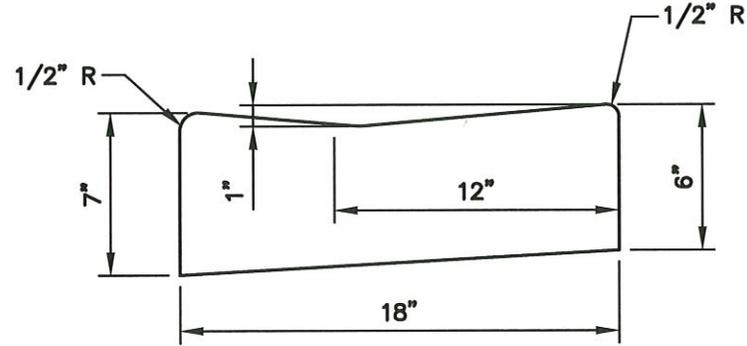
CITY OF OTHELLO  
STANDARD DETAILS  
TYPICAL ALLEY  
FIGURE S2-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





**CEMENT CONCRETE TRAFFIC CURB AND GUTTER CROSS SECTION**



**CURB RAMP AND DRIVEWAY CURB CROSS SECTION**

**TYPICAL CURB AND GUTTER**  
NTS

**NOTES:**

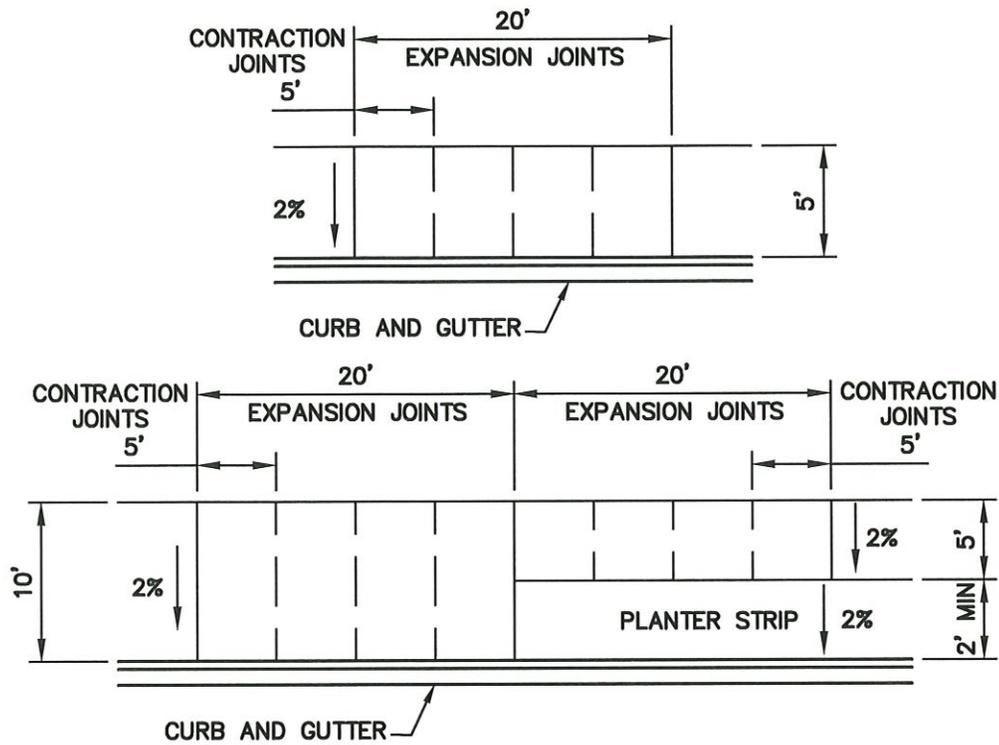
1. ALL CURB SHALL BE TRUE LINE AND GRADE.
2. FULL-DEPTH EXPANSION JOINTS SHALL BE PLACED AT 100' INTERVALS AND AT POINTS OF TANGENCY. PREMOLDED JOINT FILLER SHALL BE 3/8" THICK MATERIAL.
3. CONTRACTION JOINTS SHALL BE PLACED AT 10' INTERVALS AND AT BOTH SIDES OF THE GRATE AT CATCH BASINS.
4. EXTRUDED (SLIP-FORM) CURB AND GUTTER SHALL CONFORM TO WSDOT STANDARD SPECIFICATIONS, SECT. 8-04.3(1)A.
5. 4" OF COMPACTED CRUSHED SURFACING TOP COURSE IS REQUIRED UNDER ALL CONCRETE.
6. THE TOP, FACE, AND GUTTER SHALL BE BROOM FINISHED PARALLEL TO THE ROADWAY.
7. A MINIMUM OF 5' SHALL BE REPLACED WHEN REPLACING PORTIONS OF EXISTING CURB.
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\STANDARD DETAILS\S3-SH 1

**CITY OF OTHELLO**  
 STANDARD DETAILS  
 TYPICAL CURB AND GUTTER  
 FIGURE S3-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





TYPICAL SIDEWALK  
NTS

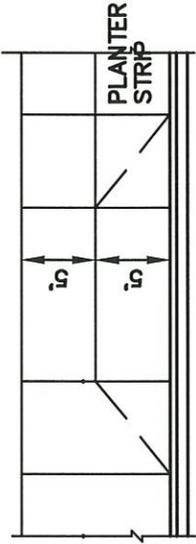
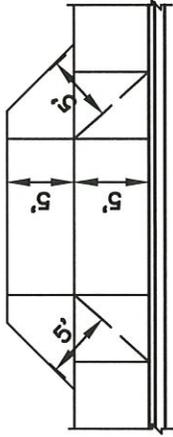
**NOTES:**

1. CONTRACTION JOINTS SHALL BE PLACED PERPENDICULAR TO THE CURB AT 5' INTERVALS.
2. FULL-DEPTH EXPANSION JOINTS SHALL BE PLACED PERPENDICULAR TO THE CURB AT 20' INTERVALS.
3. PRE MOLDED JOINT FILLER SHALL BE 3/8" THICK MATERIAL AND BE PLACED FULL DEPTH.
4. SIDEWALK AND DRIVEWAYS SHALL BE BROOM FINISHED PERPENDICULAR TO THE CURB.
5. MAINTAIN A MINIMUM OF 5' OF CLEARANCE FOR SIGN, MAILBOX, UTILITY POLE, OR ANY OTHER STRUCTURES WITHIN THE SIDEWALK.
6. 4" OF COMPACTED CRUSHED SURFACING TOP COURSE IS REQUIRED UNDER ALL CONCRETE.
7. MINIMUM SIDEWALK THICKNESS:  
     4" WHEN BEHIND CEMENT CONCRETE TRAFFIC CURB AND GUTTER.  
     6" IN ALL DRIVEWAYS (TOP OF TAPER TO TOP OF TAPER)
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY OF OTHELLO.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\9-STANDARD DETAILS\S4-SH 1

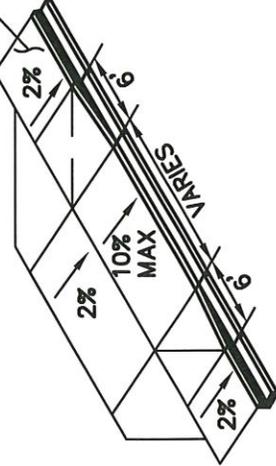
<b>CITY OF OTHELLO</b> STANDARD DETAILS TYPICAL SIDEWALK FIGURE S4-SHEET 1	#1	November, 2014	
	#2	June, 2016	
	#3	February, 2018	
	REVISION #	DATE	

--- CHANGE OF SLOPE  
 --- CONTROL JOINTS  
 (ON 5' CENTERS)

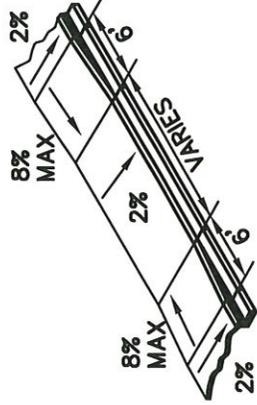
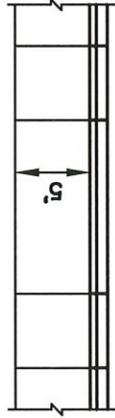


OPTION A

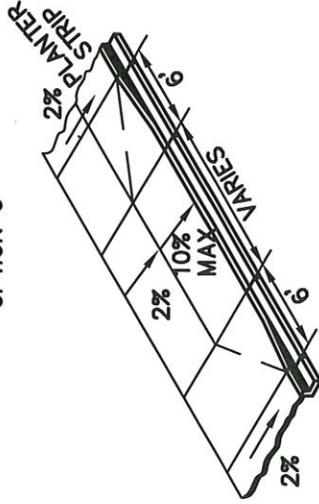
SEE NOTE 11  
 (TYP. ALL)



OPTION B



OPTION C



**NOTES:**

1. ALL JOINTS SHALL BE CLEAN AND EDGED. TRANSVERSE DRIVEWAY JOINTS SHALL BE AS SHOWN OR AS DIRECTED BY THE CITY.
2. 4" OF COMPACTED CRUSHED SURFACING TOP COURSE REQUIRED UNDER ALL CONCRETE.
3. A CURING AGENT IS REQUIRED TO BE APPLIED TO ALL EXPOSED SURFACES IMMEDIATELY AFTER BROOMING SURFACE.
4. MAXIMUM OF ONE DRIVEWAY PERMITTED PER RESIDENCE OR ONE BUSINESS. UNLESS APPROVED IN WRITING BY PUBLIC WORKS.
5. WHERE DRIVEWAY EXCEEDS 15' IN WIDTH FROM TOP OF TAPER TO TOP OF TAPER A SCRIBED JOINT SHALL BE PLACED ON CENTERLINE OF DRIVEWAY WITH 5' EQUAL SPACINGS THEREAFTER.
6. CONCRETE SHALL BE 6" THICK IN DRIVEWAY FROM TOP OF TAPER TO TOP OF TAPER.
7. DRIVEWAYS SHALL BE BROOM FINISHED PERPENDICULAR TO THE ROADWAY. THE SETBACKS WILL BE MEASURED FROM THE BACK OF THE EXISTING OR PROJECTED CURB.
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.
9. WHEN LANDINGS BEHIND DRIVEWAY SLOPES CANNOT BE ACHIEVED, OPTION B SHALL BE USED TO CONFORM WITH ADA REQUIREMENTS.
10. CROSS SLOPES ON ALL SIDEWALKS MUST BE A MINIMUM OF 1% AND A MAXIMUM OF 2%.
- 11.

DRIVEWAY SEPERATION  
 AS PER PUBLIC WORKS

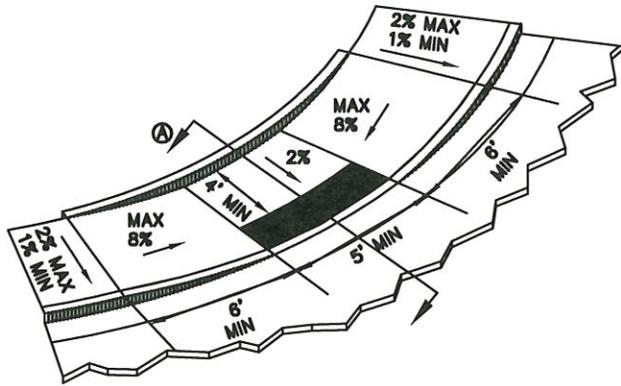
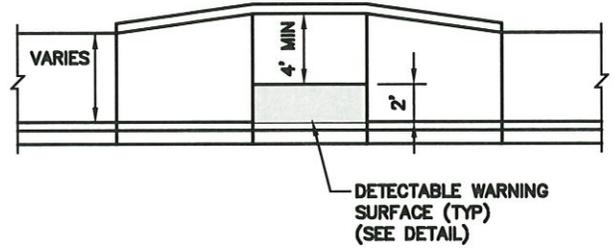
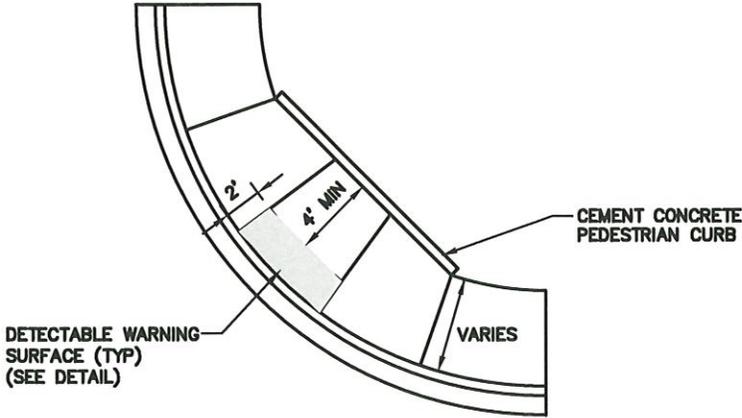
DRIVEWAY WIDTH

RESIDENTIAL - 10' MIN.  
 30' MAX.  
 OTHER - AS APPROVED



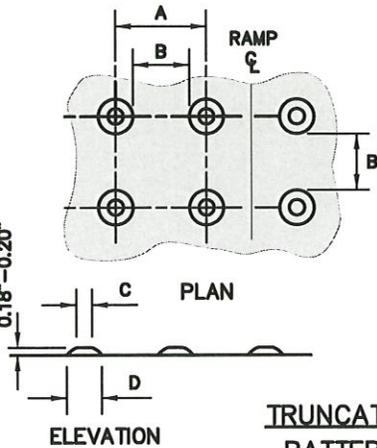
#1	November, 2014
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CITY OF OTHELLO  
 STANDARD DETAILS  
 DRIVEWAY DETAILS  
 FIGURE S4-SHEET 2



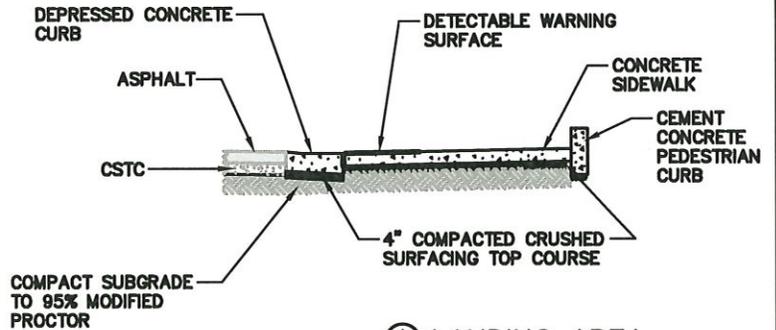
**SIDEWALK RAMP DETAIL**

NTS



**TRUNCATED DOMES PATTERN DETAIL**

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



**(A) LANDING AREA**

**GENERAL NOTES:**

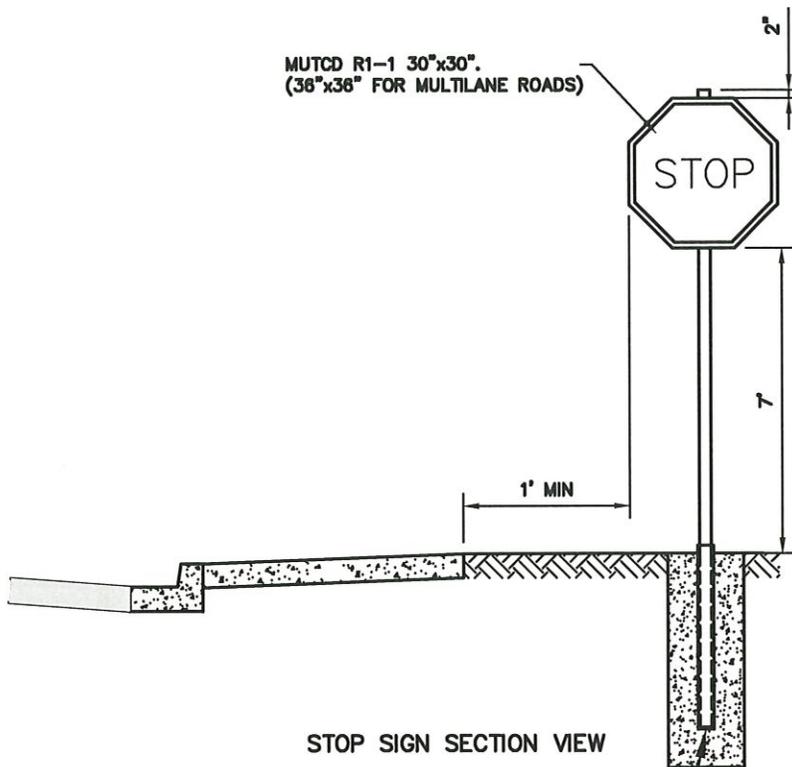
- SEE CURB DETAIL S3-SHEET 1 FOR CONSTRUCTION OF DEPRESSED CONCRETE CURB AND GUTTER FOR RAMPS.
- SEE SIDEWALK DETAIL S4-SHEET 3 FOR CONSTRUCTION OF CONCRETE SIDEWALK.
- SIDEWALK RAMP SHALL BE A MINIMUM OF 4" THICK.
- SIDEWALK RAMP SHALL BE BROOM FINISHED PERPENDICULAR TO BACK OF CURB.
- SIDEWALK RAMP SLOPES SHALL BE A MAXIMUM OF 8% (12H:1V).
- DETECTABLE WARNING SURFACE SHALL BE CONSTRUCTED OF CAST-IN-PLACE INLINE DOME TACTILE TILE MODULES. THE PATTERN OF THE DOMES SHALL CONFORM TO THE DIMENSIONS SHOWN ON THIS DETAIL.
- DETECTABLE WARNING SURFACE SHALL BE YELLOW IN COLOR. THE COLOR SHALL BE AN INTEGRAL PART OF THE MATERIAL AND SHALL NOT BE SURFACE APPLIED.
- ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.
- RAMP RUNNING SLOPES SHALL BE 8% MAXIMUM (THE RAMP LENGTH IS NOT REQUIRED TO EXCEED 15 FEET ALONG THE SIDEWALK)
- CROSS SLOPES ON ALL SIDEWALKS MUST BE A MINIMUM OF 1% AND A MAXIMUM OF 2%.

CITY OF OTHELLO  
STANDARD DETAILS  
SIDEWALK DETAILS  
FIGURE S4-SHEET 3

REVISION #	DATE
#1	November, 2014
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S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\S-STANDARD DETAILS\S4-SH 3



INSTALL SIGN POST AND BASE PER  
WSDOT STANDARD PLAN G-24.50.03  
VERIFY INSTALLATION TYPE WITH CITY

STOP SIGN INSTALLATION

NTS

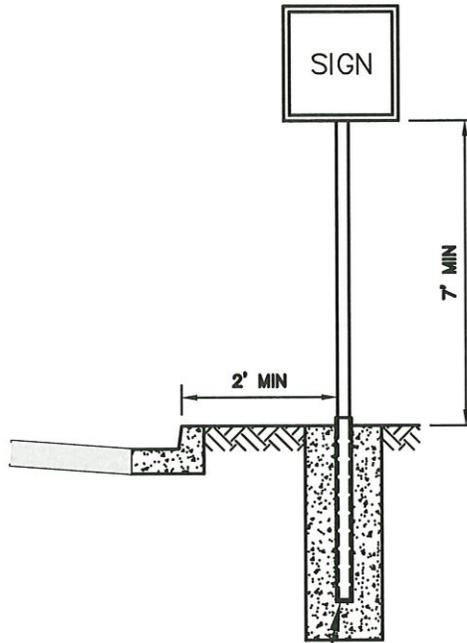
NOTES:

1. PERFORATED SIGN POSTS AND SLEEVES SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
2. MAINTAIN A MINIMUM OF 1' OF CLEARANCE BETWEEN THE SIGN EDGE AND THE BACK EDGE OF THE SIDEWALK.
3. STOP SIGNS WILL BE TYPICALLY PLACED 14' FROM THE FACE OF THE CURB ON THE STREET THEY APPROACH. EXACT LOCATION OF THE SIGN AND SLEEVE WILL BE ESTABLISHED BY THE CITY AT THE TIME OF INSTALLATION.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

CITY OF OTHELLO  
STANDARD DETAILS  
STOP SIGN INSTALLATION  
FIGURE S5-SHEET 1

#1	November, 2014
#2	June, 2016
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INSTALL SIGN POST AND BASE PER  
WSDOT STANDARD PLAN G-24.50.03  
VERIFY INSTALLATION TYPE WITH CITY

### STREET SIGN INSTALLATION

NTS

**NOTES:**

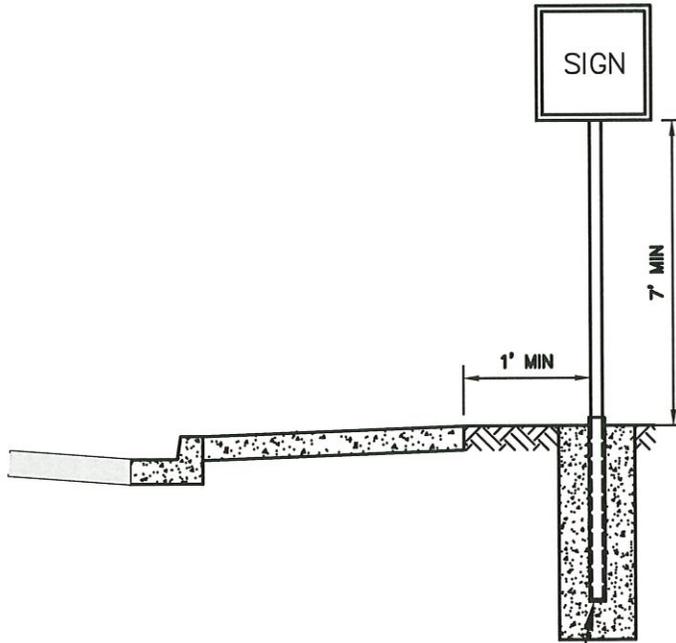
1. PERFORATED SIGN POSTS AND SLEEVES SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
2. MAINTAIN A MINIMUM OF 2' OF CLEARANCE BETWEEN THE SIGN POST AND THE FRONT EDGE OF THE CURB.
3. STOP SIGNS WILL BE TYPICALLY PLACED 14' FROM THE FACE OF THE CURB ON THE STREET THEY APPROACH. EXACT LOCATION OF THE SIGN AND SLEEVE WILL BE ESTABLISHED BY THE CITY AT THE TIME OF INSTALLATION.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\STANDARD DETAILS\S5-SH 2

CITY OF OTHELLO  
STANDARD DETAILS  
STREET SIGN INSTALLATION  
FIGURE S5-SHEET 2

#1	November, 2014
#2	June, 2016
REVISION #	DATE





INSTALL SIGN POST AND BASE PER  
 WSDOT STANDARD PLAN G-24.50.03  
 VERIFY INSTALLATION TYPE WITH CITY

**STREET SIGN INSTALLATION**  
**(WITH SIDEWALK)**

NTS

**NOTES:**

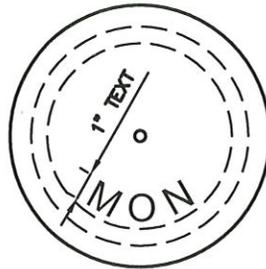
1. EXACT LOCATION OF THE SIGN AND SLEEVE WILL BE ESTABLISHED BY THE CITY AT THE TIME OF INSTALLATION.
2. PERFORATED SIGN POSTS AND SLEEVES SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
3. NO PORTION OF THE SIGN SHALL OVERHANG THE SIDEWALK.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\STANDARD DETAILS\S5-SH 3

CITY OF OHELLO  
 STANDARD DETAILS  
 STREET SIGN INSTALLATION  
 FIGURE S5-SHEET 3

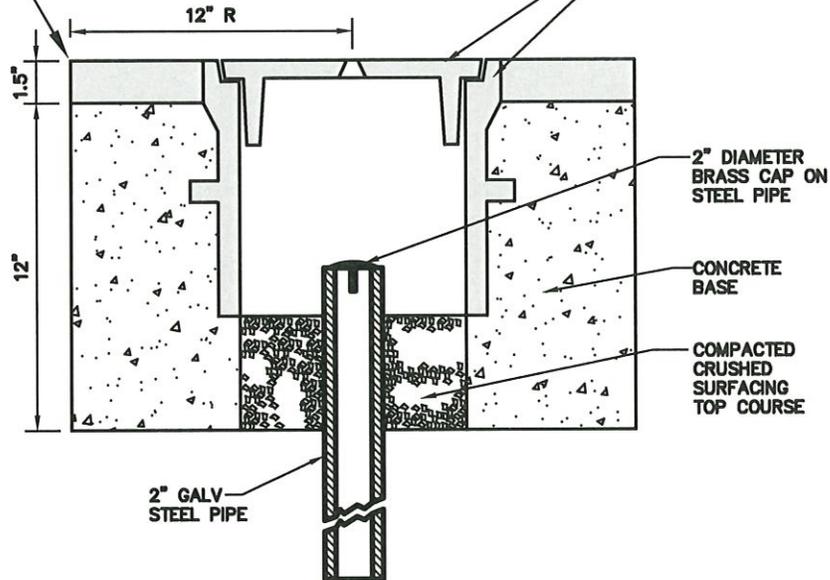
#1	November, 2014
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REVISION #	DATE





1.5" COMPACTED  
CL 3/8" PG 64-28  
HOT MIX ASPHALT

MONUMENT CASE  
AND COVER, SEE  
WSDOT STANDARD  
SPECIFICATIONS



SECTION

**MONUMENT CASE AND COVER**  
NTS

**NOTES:**

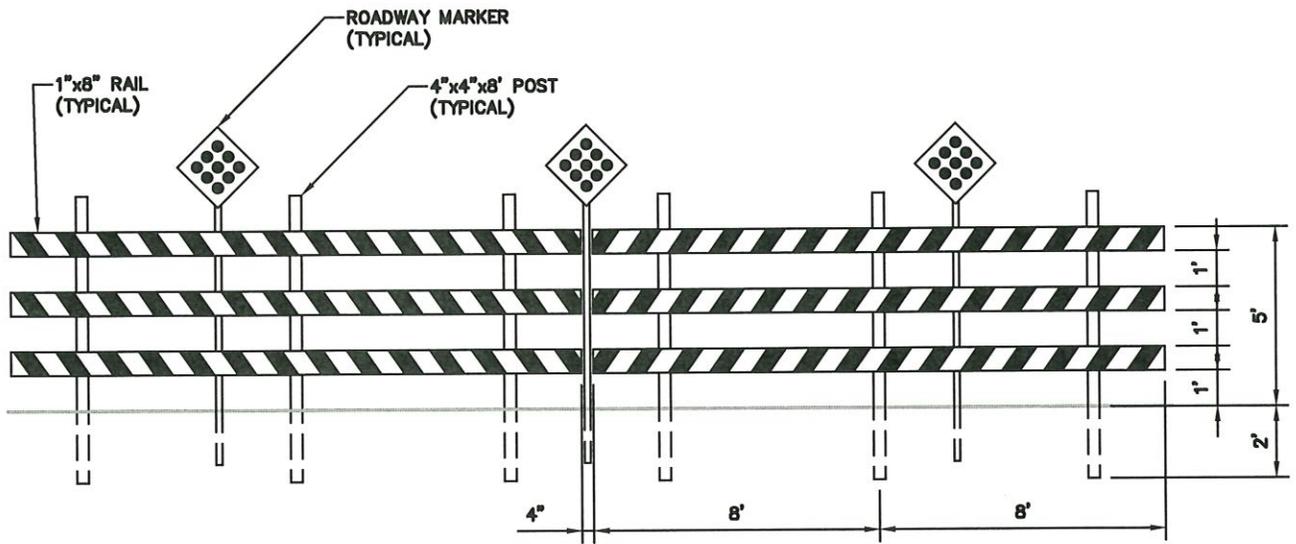
1. BRASS CAP SHALL BE A MINIMUM OF 2" IN DIAMETER.
2. AREA EXCAVATED TO INSTALL MONUMENT SHALL BE BACKFILLED WITH CSTC TO WITHIN 9" OF FINISHED GRADE (THE BOTTOM OF THE MONUMENT CASE) AND COMPACTED TO 95% OF MAXIMUM DENSITY. THE VOID INSIDE THE MONUMENT CASE SHALL ALSO BE FILLED WITH CSTC TO THE BOTTOM OF THE BRASS CAP.
3. ADJUST MONUMENT IN ASPHALT TO 1/4" BELOW FINISHED GRADE.
4. "MON" SHALL BE CAST INTO THE LID.
5. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\5-STANDARD DETAILS\S6-SH 1

CITY OF OTHELLO  
STANDARD DETAILS  
MONUMENT TYPE 1  
FIGURE S6-SHEET 1

#1	November, 2014
#2	June, 2016
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**BARRICADE FOR TEMP NO OUTLET**  
NTS

**NOTES:**

1. END-OF-ROADWAY MARKER SHALL BE PER THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SIGN OM4-2, RED ON BLACK.
2. ROADWAY MARKER POSTS TO BE 2" O.D. GALVANIZED IRON PIPE WITH 0.095" WALL THICKNESS MOUNTED IN V-LOCKS BEHIND BARRICADES.
3. 4"x4"x8' POSTS SHALL BE PRESSURE TREATED LUMBER, PRIMED AND PAINTED WHITE.
4. RAILS SHALL BE PLASTIC, 1" THICK BY 8" WIDE, RED ON WHITE, WITH STRIPES FACTORY APPLIED, ENGINEER GRADE AS SUPPLIED BY TRAFFIC SAFETY SUPPLY.
5. LENGTH OF BARRICADE SHALL BE OF A LENGTH THAT WILL PHYSICALLY RESTRICT ACCESS BY MOTORIZED VEHICLES.
6. BARRICADES SHALL MEET THE REQUIREMENTS OF SECTIONS 2B.67 AND 6F.68 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

TO BE USED ONLY AS REQUIRED  
OR APPROVED BY PUBLIC WORKS

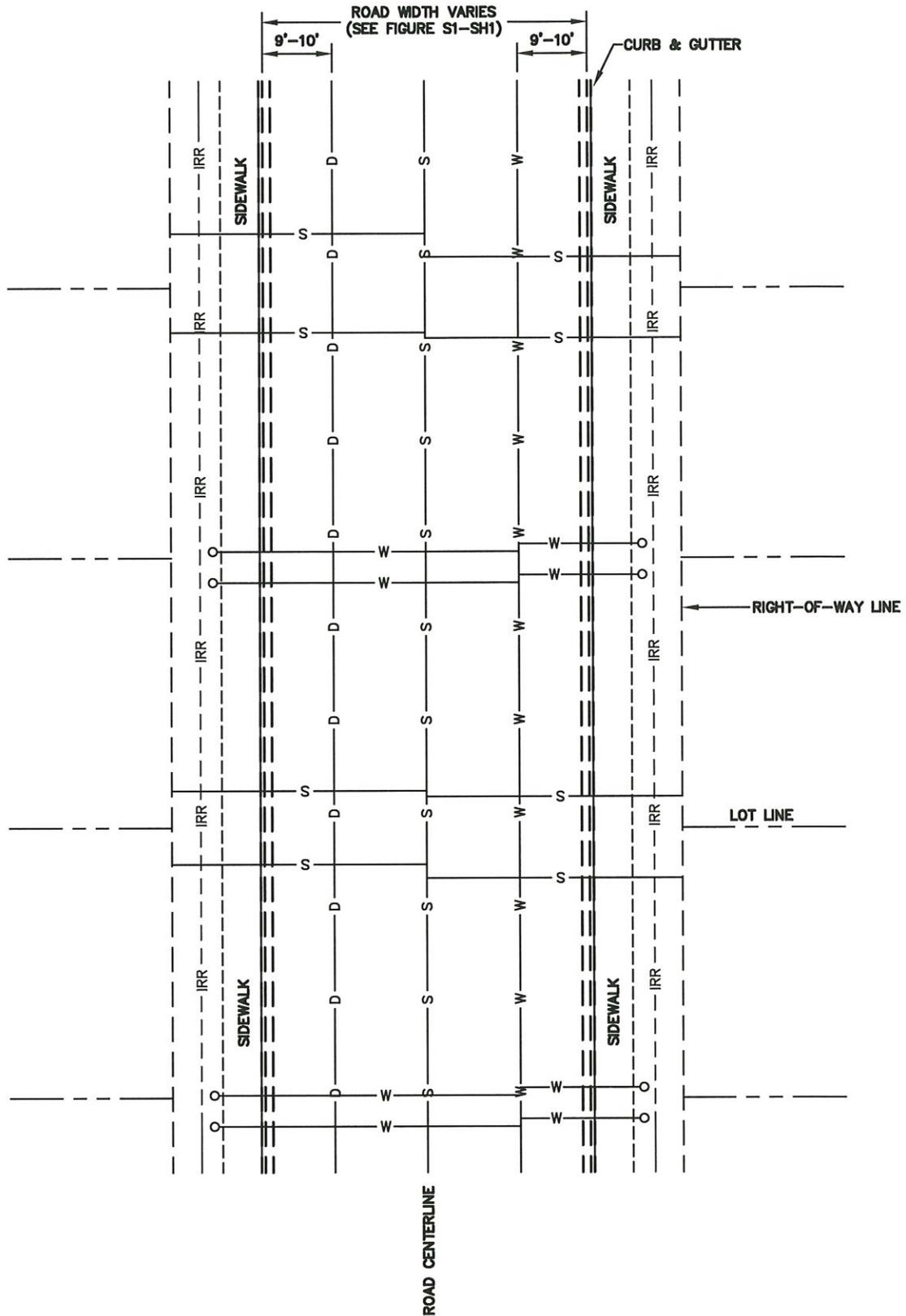
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CITY OF OTHELLO  
STANDARD DETAILS  
BARRICADE FOR TEMP NO OUTLET  
FIGURE S7-SHEET 1

#1	November, 2014
#2	June, 2016
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- W — ○ WATER MAIN: METERS TO BE INSTALLED AT THE BACK OF SIDEWALK
- S — SANITARY SEWER: EXTEND SERVICE STUBS OUT TO EDGE OF RIGHT OF WAY
- D — STORM DRAIN MAIN
- IRR — IRRIGATION MAIN

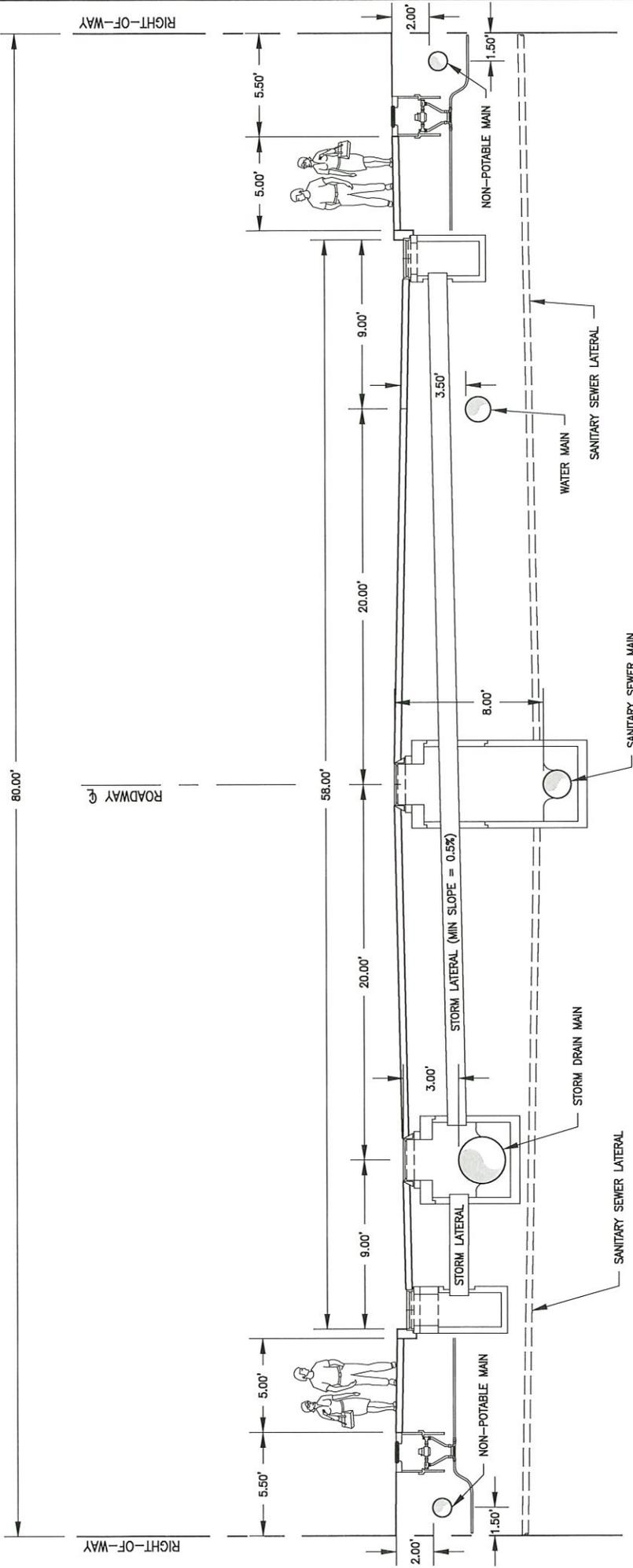
**NOTE:**

ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

**CITY OF OTHELLO**  
 STANDARD DETAILS  
 TYPICAL STREET UTILITIES LAYOUT  
 FIGURE S8-SHEET 1

#1	November, 2014
#2	June, 2016
#3	February, 2018
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**GENERAL NOTES:**

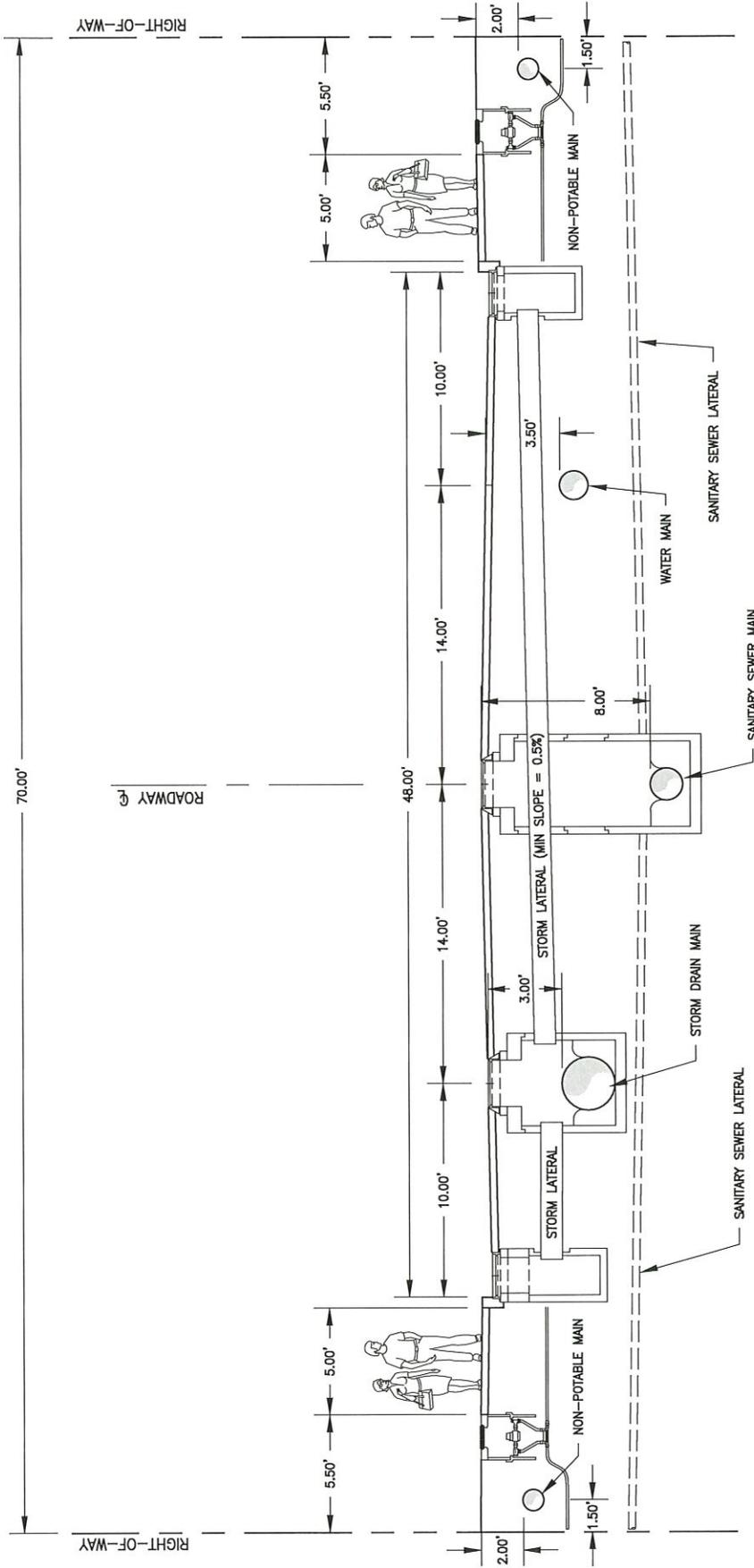
1. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029) WHEN THE NON-POTABLE PIPELINE MUST CROSS ABOVE THE POTABLE PIPELINE, ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
2. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029) THE MINIMUM VERTICAL SEPARATION BETWEEN POTABLE PIPELINE CROSSING OVER NON-POTABLE PIPELINE SHALL BE 18". IF 18" OF SEPARATION IS NON-ATTAINABLE THEN ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
3. SEE STANDARD DETAIL(S) \*FIGURE W5-SHEET 1" AND/ OR \*FIGURE W5-SHEET 2" FOR THE WATER METER SERVICE, SETTER, AND METER BOX LAYOUT, MATERIALS, AND BURY DEPTHS.
4. ALL STORM DRAIN LATERALS BURIED SHALLOWER THAN -' MUST BE H-20 TRAFFIC RATED.

**TYPICAL ROAD SECTION - ARTERIAL STREET**



#1	November, 2014
#2	June, 2016
#3	February, 2018
REVISION #	DATE

**CITY OF OTHELLO**  
 STANDARD DETAILS  
 TYPICAL ARTERIAL STREET UTILITY LAYOUT  
 FIGURE S8-SHEET 2



**GENERAL NOTES:**

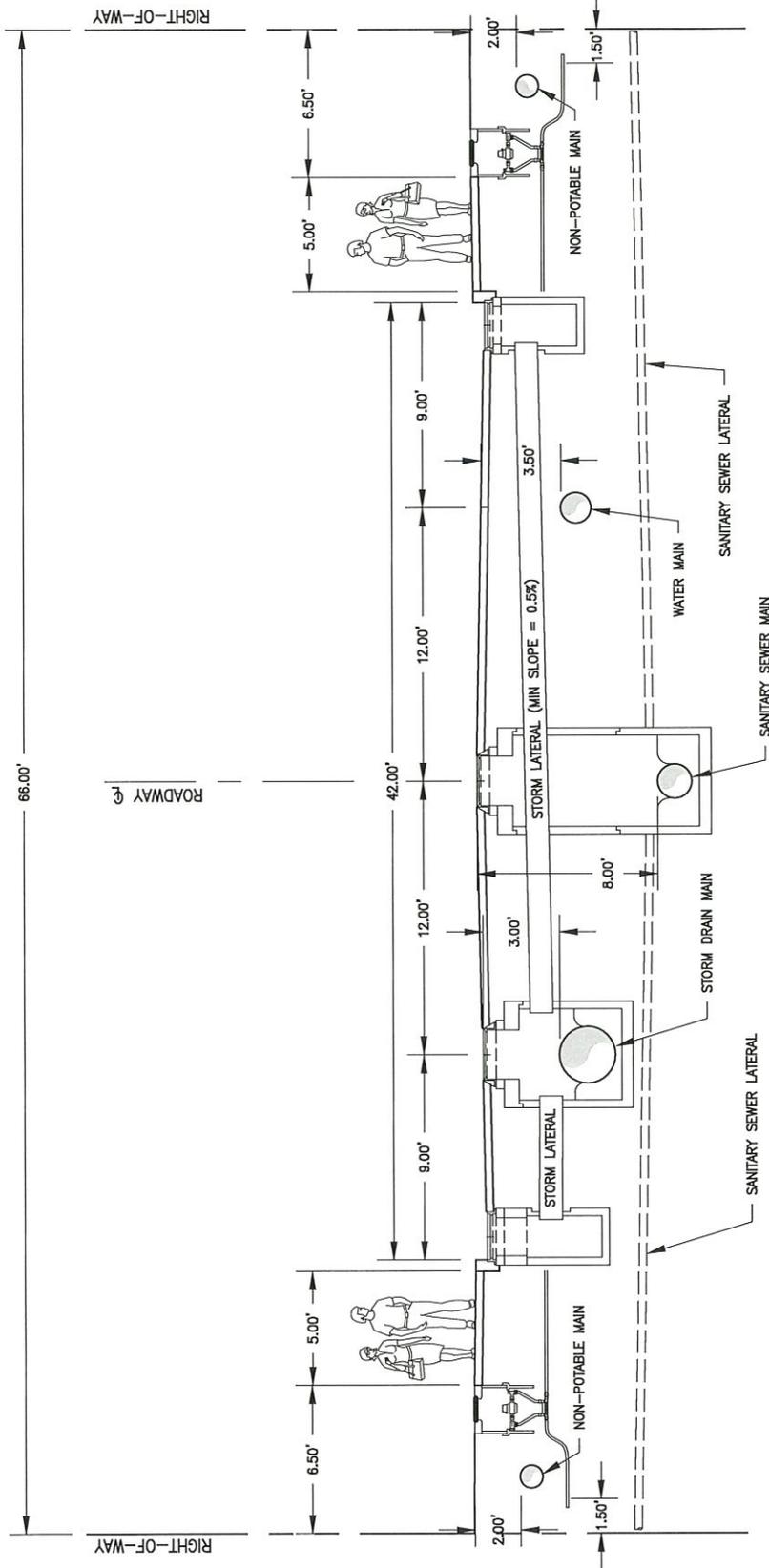
1. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029) WHEN THE NON-POTABLE PIPELINE MUST CROSS ABOVE THE POTABLE PIPELINE, ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
2. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029) THE MINIMUM VERTICAL SEPARATION BETWEEN POTABLE PIPELINE CROSSING OVER NON-POTABLE PIPELINE SHALL BE 18" IF 18" OF SEPARATION IS NON-ATTAINABLE THEN ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
3. SEE STANDARD DETAIL(S) "FIGURE W5-SHEET 1" AND/ OR "FIGURE W5-SHEET 2" FOR THE WATER METER SERVICE, SETTER, AND METER BOX LAYOUT, MATERIALS, AND BURY DEPTHS.
4. ALL STORM DRAIN LATERALS BURIED SHALLOWER THAN -' MUST BE H-20 TRAFFIC RATED.

**TYPICAL ROAD SECTION – COLLECTOR STREET**



#1	November, 2014	REVISION #	DATE
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#3	February, 2018		

**CITY OF OTHELLO**  
 STANDARD DETAILS  
 TYPICAL COLLECTOR STREET UTILITY LAYOUT  
 FIGURE S8-SHEET 3



**GENERAL NOTES:**

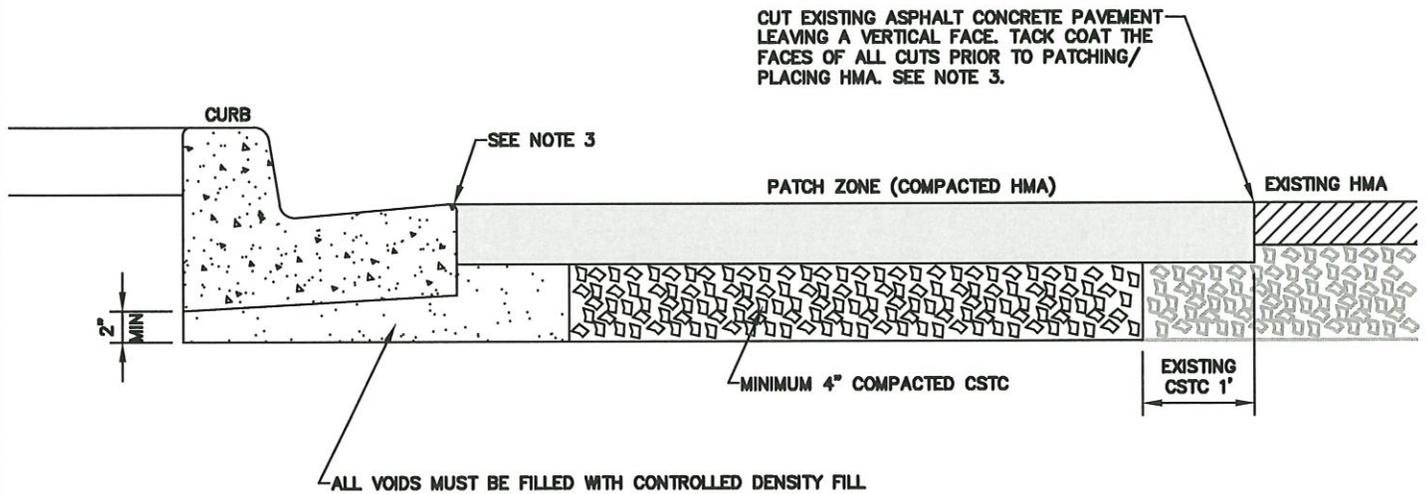
1. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029), WHEN THE NON-POTABLE PIPELINE MUST CROSS ABOVE THE POTABLE PIPELINE, ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
2. ACCORDING TO THE PIPELINE SEPARATION DESIGN AND INSTALLATION REFERENCE GUIDE (PUBLICATION NUMBER 06-10-029), THE MINIMUM VERTICAL SEPARATION BETWEEN POTABLE PIPELINE CROSSING OVER NON-POTABLE PIPELINE SHALL BE 18". IF 18" OF SEPARATION IS NON-ATTAINABLE THEN ONE OR BOTH OF THE PIPELINES SHALL BE ENCASED WITH PRESSURE RATED CASING PIPE OR CONTROLLED DENSITY FILL (CDF) AT LEAST 10 FT ON EITHER SIDE OF THE CROSSING.
3. SEE STANDARD DETAIL(S) \*FIGURE W5-SHEET 1" AND/ OR \*FIGURE W5-SHEET 2" FOR THE WATER METER SERVICE, SETTER, AND METER BOX LAYOUT, MATERIALS, AND BURY DEPTHS.
4. ALL STORM DRAIN LATERALS BURIED SHALLOWER THAN -' MUST BE H-20 TRAFFIC RATED.

TYPICAL ROAD SECTION – NEIGHBORHOOD STREET



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CITY OF OTHELLO  
 STANDARD DETAILS  
 TYPICAL NEIGHBORHOOD STREET UTILITY LAYOUT  
 FIGURE S8-SHEET 4



**PATCHING DETAIL**  
NTS

**NOTES:**

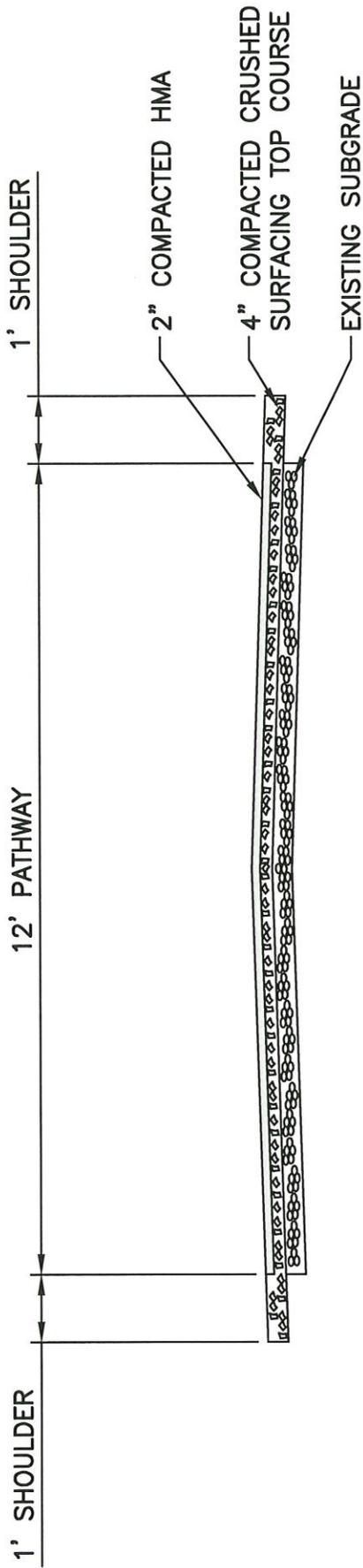
1. HOT MIX ASPHALT (HMA) IN THE PATCH ZONE SHALL BE CL 3/8", PG 64-28. MINIMUM THICKNESS SHALL BE 3", OR MATCH EXISTING, WHICHEVER IS GREATER THAN 6". ALL PATCHES SHALL BE PLACED IN A MINIMUM OF 2 LIFTS. MAXIMUM DEPTH OF LIFTS SHALL BE 3" COMPACTED.
2. PATCH WIDTH MUST ACCOMMODATE PROPER COMPACTION METHODS AS APPROVED BY THE CITY.
3. SEAL ALL JOINTS WITH HOT ASPHALT OIL. AFTER SEALING, A SAND BLANKET SHALL BE APPLIED TO HELP ALLEVIATE TRACKING.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
PATCHING DETAIL  
FIGURE S9-SHEET 1

#1	November, 2014
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**WALKING PATH**  
NOT TO SCALE

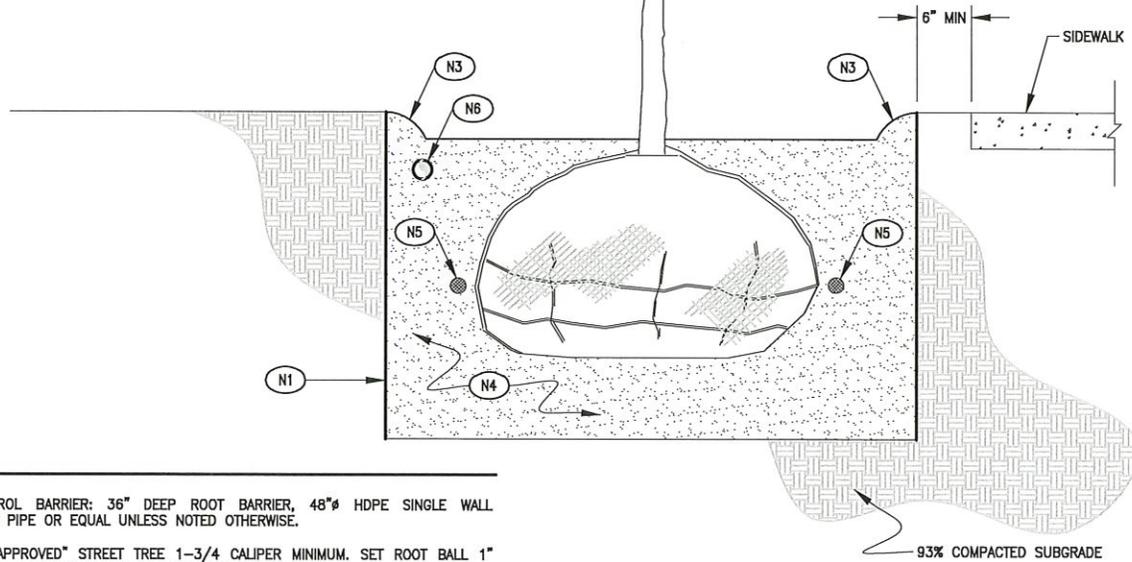
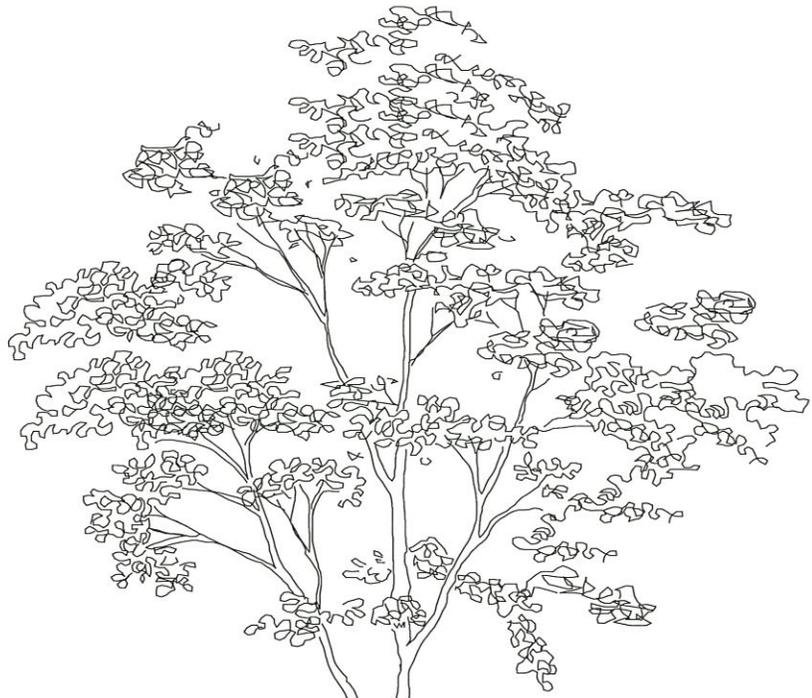
**NOTE:**

WALKING PATHS IN PARKS WILL BE 14- FEET WIDE WITH NO GRAVEL SHOULDERS.



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CITY OF OTHELLO  
STANDARD DETAILS  
TYPICAL WALKING PATH  
FIGURE S10-SHEET 1



**NOTES:**

- (N1) ROOT CONTROL BARRIER: 36" DEEP ROOT BARRIER, 48"Ø HDPE SINGLE WALL CORRUGATED PIPE OR EQUAL UNLESS NOTED OTHERWISE.
- (N2) SPECIFIED "APPROVED" STREET TREE 1-3/4 CALIPER MINIMUM. SET ROOT BALL 1" ABOVE FINISH GRADE TO ALLOW FOR SETTLING.
- (N3) WATER RETENTION BERMS
- (N4) TOPSOIL - TYPE B PER WSDOT STANDARD SPECIFICATIONS
- (N5) TREE FERTILIZER TABLET PER MANUFACTURERS RECOMMENDATIONS
- (N6) 3/4" (MIN) POLY PIPE (ASTM CLASS 80 D2239) WITH BUBBLER HEADS PER TREE PER RECOMMENDATION OF LANDSCAPE/ IRRIGATION SUB.

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**CITY OF OTHELLO**  
 STANDARD DETAILS  
 TREE PLANTER DETAIL  
 FIGURE S11-SHEET 1

#1	November, 2014
#2	June, 2016
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# SECTION 6

## **6. WATER SYSTEM STANDARDS**

### **6.01 General**

The standards established by this chapter are intended to represent the minimum standards for the design and construction of water system facilities. Greater or lesser requirements may be mandated by the City due to localized conditions. Extensions, connections or modifications to the existing system shall be in compliance with the State Department of Health.

### **6.02 Design Standards**

- A. Design Standards are divided into the following categories:
  - 1. Any system connected to the City system, whether inside the City limits or not.
- B. Detailed plans shall be submitted for the city's review which provides the locations, size, and type of the proposed water system and points of connection. These Plans shall be separate from Sewer Plans.
- C. Project plans shall have a horizontal scale 20 feet to the inch and a vertical scale of not more than 5 feet to the inch. Plans shall show:
  - 1. Locations of streets, rights-of-way, existing utilities, and water system facilities.
  - 2. Ground surface, pipe type and size, and water valves and hydrants stationing.
  - 3. All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly sewer lines, gas mains, storm drains, overhead and underground power and all underground structures, telephone lines and television cables.
  - 4. All utility easements and applicable County recording number.
- D. Computations and other data used for design of the water system shall be submitted to the City for approval.
- E. The water system facilities shall be constructed in conformance with these Specifications and current amendments thereto and other applicable standards as allowed by the City.

- F. Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WPCF, and APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints.
- G. Except as otherwise noted herein, all work shall be accomplished as recommended in applicable American Water Works Association (AWWA) Standards, and according to the recommendations of the manufacturer of the material or equipment concerned.
- H. The location of the water mains, valves, hydrants, and principal fittings including modifications shall be staked by the Developer. No deviation shall be made from the required line or grade. The Contractor shall verify and protect all underground and surface utilities encountered during the progress of this work.
- I. Prior to final inspection, all pipelines shall be tested and disinfected.
- J. Before acceptance of the water system by the City, all pipes, assemblies, and other appurtenances shall be cleaned of all debris and foreign material. After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.
- K. The Developer shall be required, upon completion of the work and prior to acceptance by the City, to furnish the City with a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and he shall make all necessary repairs during that period at their own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors and suppliers of material or equipment where such warranties are required and shall deliver copies to the City upon completion of the work.

### **6.03 General Requirements**

- A. Prior to construction, the Contractor shall notify the City for a pre-construction meeting.
- B. Work shall be performed only by contractors experienced in laying public water mains.
- C. Prior to any work being performed, the Contractor shall contact the City's Public Works Director to set forth his proposed work schedule. Work schedule shall be in general conformance with WSDOT 1-08.3.
- D. The Contractor shall obtain approval of materials to be used from the City's Public

Works Director prior to ordering of materials.

- E. Water mains shall be laid only in dedicated streets or in easements which have been granted to the City. A street is normally not considered dedicated until the plat which created it has been officially filed with the County Auditor.
- F. All water main distribution pipeline construction shall have a minimum 36-inch cover from finished grade and 42-inch cover over transmission mains. Mains shall be laid straight and be located parallel to and northerly or easterly of street centerline. Horizontal distance from centerline shall be as shown in City of Othello Standard Details Figure S8 Sheet 2, Sheet 3, and Sheet 4. Water mains shall be extended to the far property line(s) of the property being served. Off-site extensions are required to hydraulically loop existing and new systems. Over sizing of water mains may be required to be installed per City's current Water System Plan. The cost of oversizing pipe shall be borne by the developer.
- G. The City may require mains to be oversized to handle future flows consistent with planning documents. Oversizing of mains and extending utilities to the far property lines shall be the responsibility of the developer.
- H. The City requires minimum pipe sizes of 8-inch in residential zones, 10-inch in commercial zones, and 12-inch in industrial zones unless a larger size is determined to be required by the City. The City also requires a minimum 12-inch main along its transmission grid, which generally follows section lines.
- I. Every cross shall have no less than three valves, every tee shall have no less than two valves, and every elbow not within 400 feet from a valve shall have one valve. An in-line valve shall be installed on straight runs of pipe every 400 feet.
- I. Unless otherwise approved or required by the Public Works Director, the water main shall be ductile iron pipe or C900/C905 PVC as shown below. The minimum size for all water lines shall be 8 inches, except for pipes connecting hydrants less than 60' long.

<u>Pipe Diameter</u>	<u>Class</u>	
	<u>D.I.</u>	<u>PVC</u>
6" through 14"	Class 52	Class 150
16" and larger	Class 50	Class 150

EXCEPTION: 6-inch hydrant spools and pipelines located beneath rock or retaining walls shall be DI. 53.

- J. Pipes connecting hydrants to mains shall be 6-inch in diameter or larger and not longer than 60'. 60 plus feet requires 8-inch or larger.
- K. Permanent dead end lines are not permitted. Water mains on cul-de-sacs shall extend to the plat line beyond the cul-de-sac to neighboring property for a

convenient future connection, and have a 2-inch blow off assembly installed at the termination point. All lines shall be capable of being looped upon full development.

- L. All materials shall be new and undamaged.
- M. All fittings shall be cement-lined ductile iron.
- N. Provide bends in field to suit construction and in accordance with pipe manufacturer's recommendations so as not to exceed allowable deflection at pipe joints.
- O. Provide thrust blocking at all fittings and bends in accordance with the City standards and conditions. Blocking to be designed by Developer's Engineer.
- P. Provide anchor blocking at all up-thrust vertical bends in accordance with City standards. Blocking to be designed by Developer's Engineer.
- Q. All valve marker posts shall be painted yellow and marked with the distance to valve being referenced.
- R. Residential water service pipe shall be one-inch K copper with no joints.
- S. Commercial service lines between the water main and the water meter shall be 1-inch minimum with a 1-inch meter (no joints)
- T. Commercial meter services and meter boxes shall be set to final grade and all adjustments shall be made prior to final pressure testing of the system.
- U. All water services shall end within road rights-of-way or easements, except when otherwise approved by the Public Works Director.
- V. All water services shall be installed by the City, unless approved by the Public Works Director. All costs associated with this work shall be paid for by the Developer.
- W. One sampling station is required for a development in size of 1 to 10 lots. One additional station is required for each additional 50 lots or portions thereof.
- X. All new buildings and residences shall include in their water service a suitable pressure reducing valve and expansion tank to protect the plumbing from excessive pressures, unless waived by the City.
- Y. All new service connections shall comply with the "Accepted procedure and practice in Cross Connection Control Manual" as published by the Pacific Northwest Section of the American Water Works Committee, November 1995, Fifth Edition, and current amendments thereto. A copy of such is available for review at the Public Works office.

- Z. Cut in connections shall not be made on Fridays, holidays or weekends. All tapping sleeves and tapping valves shall be pressure tested prior to making connection to existing mains. Taps are to be made by City personnel (fee is required).
- AA. Contractor shall request the Public Works Director approval prior to any water shut-off or turn-on, affecting the water system, a minimum of 48 hours in advance. The Public Works Department shall operate all valves in existing service mains.
- AB. Road restoration shall be per City, County or State design and construction standards, as may be applicable. Developer and Contractor shall become familiar with all State, County and City conditions of required permits, and shall adhere to all conditions and requirements.

#### **6.04 Materials & Inspections**

##### **A. Inspections**

The Contractor shall request for inspection a minimum of 48 hours in writing prior to the Contractor's scheduled need. Inspection shall be required for the following items of work:

1. Pipe and bedding installation.
2. Backfill and compaction.
3. Pressure testing

##### **B. Water Mains & Fittings**

1. Water mains to be installed unless otherwise approved (or required) in writing by the City Engineer shall be either ductile iron or C900 or C905 PVC pipe.
2. Ductile Iron shall be:
  - a. The ductile iron pipe shall conform to ANSI/AWWA C151/A21.51-91 Standards, and current amendments thereto, except the ductile iron pipe shall be thickness Class 52 for 4" through 14" diameter pipe (except for 6-inch hydrant spools which shall be Class 53) and Class 50 for 16" and larger. Grade of iron shall be a minimum of 60-42-10. The pipe shall be cement lined to a minimum thickness of 1/16", and the exterior shall be coated with an asphaltic coating. Each length shall be plainly marked with the manufacturer's identification, year case, thickness, class of pipe and weight.
3. PVC pipe shall conform to AWWA C900 or C905, Class 150, capable of connecting to ductile iron fittings. All fittings shall be ductile iron.
4. Type of joint shall be mechanical joint or push-on type, employing a single

gasket, such as "Tyton", except where otherwise calling for flanged ends. Bolts furnished for mechanical joint pipe and fittings shall be high strength ductile iron, with a minimum tensile strength of 50,000 psi.

5. Restrained joint pipe, where shown on the Plans shall be push-on joint pipe with "Fast Tight" gaskets as furnished by U.S. Pipe or equal for 12" diameter and smaller pipe and "TR FLEX" as furnished by U.S. Pipe or equal for 16" and 24" diameter pipes. The restrained joint pipe shall meet all other requirements of the non-restrained pipe.
6. All pipe shall be jointed by the manufacturer's standard coupling, be all of one manufacturer, be carefully installed in complete compliance with the manufacturer's recommendations.
7. Joints shall be "made up" in accordance with the manufacturer's recommendations, standard joint materials, including rubber ring gaskets, shall be furnished with the pipe. Material shall be suitable for the specified pipe size and pressures.
8. All fittings shall be short-bodied, ductile iron complying with applicable ANSI/AWWA C110 or C153 Standards for 350 psi pressure rating for mechanical joint fittings and 250 psi pressure rating for flanged fittings. All fittings shall be cement lined and either mechanical joint or flanged, as indicated on the plans.
9. Fittings in areas shown on the Plans for restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be Romac "Grip Ring" (retainer glands) or City approved equal.
10. All couplings shall be ductile iron mechanical joint sleeves.
11. The pipe and fittings shall be inspected for defects before installation. All lumps, blisters and excess coal tar coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry, and free from oil and grease before the pipe is laid. Any damage to the interior lining caused by cutting or other means must be repaired prior to installation.
12. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. After placing a length of pipe in the trench, the spigot end shall be centered in the bell and pipe forced home and brought to correct line and grade. The pipe shall be secured in place with select backfill tamped under it. Precaution shall be taken to prevent dirt from entering the joint space. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. If

water is in the trench when work resumes, the seal shall remain in place until the trench is pumped completely dry. No pipe shall be laid in water or when trench conditions are unsuitable.

13. The cutting of pipe for inserting fittings or closure pieces shall be done in a neat and workmanlike manner, without damage to the pipe or cement lining, and so as to leave a smooth end at right angles to the axis of the pipe. Pipe shall be laid with bell ends facing in the direction of the laying, unless directed otherwise by the City. Wherever it is necessary to deflect pipe from a straight line, the amount of deflection allowed shall not exceed pipe manufacturer's recommendations.
14. For connection of mechanical joints, the socket, plain end of each pipe and gasket shall be cleaned of dirt before jointing, and shall be jointed according to manufacturer's directions. Bolts shall be tightened alternately at top, bottom and sides, so pressure on gasket is even.
15. For connection of "Tyton" joints, the jointing shall be done according to manufacturer's recommendations, with special care used in cleaning gasket seat to prevent any dirt or sand from getting between the gasket and pipe. Lubricant to be used on the gasket shall be non-toxic and free from contamination. When a pipe length is cut, the outer edge of the cut shall be beveled with a file to prevent injury to the gasket during jointing.
16. Valves, fittings, plugs and caps shall be set and jointed to pipe in the manner as required. All dead ends on new mains shall be closed with dead end M.J. plugs.
17. Fittings shall be "blocked" with poured-in-place concrete, with a firm minimum bearing against an undisturbed earth wall. Timber blocking and precast concrete blocks shall not be permitted. Thrust blocks shall be poured as soon as possible after setting the fittings in place to allow the concrete to "set" before applying the pressure test. The concrete thrust blocks shall be in place before beginning the pressure test. Anchor blocks shall be allowed to set sufficiently to develop the necessary bond strength between the reinforcing rods and the concrete anchor before beginning the pressure test.
18. All of the new piping, valves and blocking shall have been installed, disinfected and tested up to the point of cutting into existing lines before the crossover is made. The crossover to the existing system shall be in full readiness, including the cut and sized specials. The City shall be given 48 hours' notice in advance of the planned "cut-ins". All sleeves shall be ductile iron.

## C. Valves

All valves 14" and larger shall be butterfly valves. All valves 12" and smaller shall be resilient seat gate valves.

### 1. Resilient-Seated Gate Valves

All gate valves shall conform to ANSI/AWWA C509-87 Standards for resilient-seated, high strength, bronze stemmed gate valves. The valves shall be iron-bodied, iron disk completely encapsulated with polyurethane rubber and bronze, non-rising stem with "O" ring seals. The polyurethane sealing rubber shall be fusion bonded to the wedge to meet ASTM tests for rubber to metal bond ASTM D429. The valves shall open counter-clockwise and be furnished with 2-inch square operating nuts except valves in vaults shall be furnished with hand wheels. All surfaces, interior and exterior shall be fusion bonded epoxy coated, acceptable for potable water.

The valves shall be set with stems vertical. The axis of the valve box shall be common with the axis projected off the valve stem. The tops of the adjustable valve boxes shall be set to the existing or established grade, whichever is applicable.

Valves shall be Clow, Mueller, M&H, or approved equal by the Public Works Director.

### 2. Butterfly Valves

Butterfly valves shall be of the tight closing rubber seat type with rubber seat either bonded to the body or mechanically retained in the body with no fasteners or retaining hardware in the flow stream. The valves may have rubber seats mechanically affixed to the valve vane. Where threaded fasteners are used, the fasteners shall be retained with a locking wire or equivalent provision to prevent loosening. Rubber seats attached to the valve vane shall be equipped with stainless steel seat ring integral with the body, and the body internal surfaces shall be epoxy coated to prevent tuberculation buildup which might damage the disc-mounted rubber seat.

No metal-to-metal sealing surfaces shall be permitted. The valves shall be bubble-tight at rated pressures with flow in either direction, and shall be satisfactory for applications involving valve operations after long periods of inactivity. Valve discs shall rotate ninety (90) degrees from the full open position to the tight shut position. The valves shall meet the full requirements of AWWA C504, Class 150B.

### 3. Resilient-Seated Gate Valves

All gate valves shall conform to ANSI/AWWA C509-87 Standards for resilient-seated, high strength, bronze stemmed gate valves. The valves shall be iron-bodied, iron disk completely encapsulated with polyurethane rubber and bronze, non-rising stem with "O" ring seals. The polyurethane sealing rubber shall be fusion bonded

to the wedge to meet ASTM tests for rubber to metal bond ASTM D429. The valves shall open counter-clockwise and be furnished with 2-inch square operating nuts except valves in vaults shall be furnished with hand wheels. All surfaces, interior and exterior shall be fusion bonded epoxy coated, acceptable for potable water.

The valves shall be set with stems vertical. The axis of the valve box shall be common with the axis projected off the valve stem. The tops of the adjustable valve boxes shall be set to the existing or established grade, whichever is applicable.

Valves shall be Clow, Mueller, M&H, or approved equal by the Public Works Director.

#### **4. Tapping Sleeves & Tapping Valves**

The tapping sleeves shall be stainless steel tapping sleeves rated for a working pressure of 200 psi minimum and furnished complete with joint accessories. Tapping sleeves shall be constructed in two sections for ease of installation and shall be assembled around the main without interrupting service.

Mechanical joint style sleeves shall be ductile iron and is required for size-on-size connection to cast iron pipe. Mechanical joint sleeves shall be cast by Clow, Dresser, Mueller, Tyler, U.S. Pipe, or approved equal by the Public Works Director.

Tapping valves shall be provided a flange by mechanical joint outlet for use with ductile iron pipe and shall have oversized seat rings to permit entry of the tapping machine cutters. In all other respects, the tapping valves shall conform to the resilient seat gate valves herein specified with regards to operation and materials.

The installation of the tapping sleeves and valves shall be performed by a qualified contractor.

All taps will be made by the Public Works Department. Fees are required based on the City's actual costs.

#### **5. All Valves**

All valves with operating nuts located more than 42" below finished grade shall be equipped with extension stems to bring the operating nut to within 18" of the finished grade.

At the top of the extension stem, there shall be a 2-inch standard operating nut, complete with a centering flange that closely fits the 5-inch pipe encasement of the extension stem. The valve box shall be set in a telescoping fashion around the 5-inch pipe cut to the correct length to allow future adjustment up or down.

Each valve shall be provided with an adjustable two-piece cast iron valve box of five inches minimum inside diameter. Valve boxes shall have a top section with a

16-inch minimum length. The valve boxes and covers shall be EJ 6800 with locking lid or approved equal by the Public Works Director.

**6. Valve Markers**

For each valve outside of asphalt, provide a valve concrete pad 24" x 24" x 6" with reinforcing mesh centered over valve box and set to grade.

**D. Fire Hydrants**

All fire hydrants shall be approved by the National Board of Fire Underwriters and conform to AWWA Specification C502, breakaway type, in which the valve will remain closed if the barrel is broken. The hydrant barrel shall have a diameter of not less than 8-1/2 inches, and the valve diameter shall be not less than 5-1/4 inches. Each hydrant shall be equipped with two 2-1/2 inch hose ports (National Standard Thread), and one 4-1/2 inch pumper connection (National Standard Thread), with permanent 5-inch Storz hydrant adaptor and Storz blind cap which shall be installed on the hydrant prior to installation. Each hydrant shall be equipped with a suitable positive acting drain valve and a 1-1/4 inch counter-clockwise opening pentagonal operating nut. The fire hydrants shall be Waterous Pacer or, if approved by the Public Works Director, M&H 929.

The holding spools between the gate valve and fire hydrant shall be made from 6-inch Class 53 ductile iron pipe, 0.34-inch wall thickness, or C900 PVC. The hydrant and gate valve shall be anchored in place using holding spools and mechanical joint restraint device. Thrust block at all fittings shall be in accordance with city standards and conditions. Holding spools with length in excess of 17 feet shall be supplied with an M. J. sleeve and mechanical joint restraint device.

The fire hydrants shall be painted per local Fire Marshall requirements with two coats of Preservative Brand caterpillar or international yellow paint. After installation, they shall be wire brushed and field painted with two additional coats of similar yellow enamel paint. Distance to the hydrant valve shall be clearly stenciled in black numerals 2-inches in height on the fire hydrant below the pumper port.

Between the time that the fire hydrant is installed and the completed facility is placed in operation, the fire hydrant shall at all times be wrapped in burlap, or covered in some other suitable manner to clearly indicate that the fire hydrant is not in service.

**E. Blow-offs & Air Relief Assemblies:**

2-inch blow off assemblies shall be installed at the terminus of all dead end water mains. Blow offs utilized by the Contractor for flushing the water main shall be sufficient size to obtain 2.5 feet per second velocity in the main. Temporary blow-offs shall be removed and replaced with a suitably sized watertight brass plug.

2-inch air and vacuum release valves shall be installed at principal high points in the system in accordance with the Standard Detail. The installation of these items shall include connection piping, gate valve, valve box, and all accessories. Valve markers shall be optional with City.

**F. Water Sampling Station**

One water sampling station shall be furnished and installed for each development in size of 1 to 10 lots. One additional sampling station shall be furnished and installed for each additional 50 lots or portion thereof. The water sampling station(s) shall be furnished and installed at a location as determined by the Public Works Director and as further shown on the Standard Detail.

**G. Bedding for Water Mains and Service Lines**

**A. Ductile Iron and PVC Pipe (All Sizes).**

Pipe bedding material to be installed and compacted under, around and above all pipe as specified in this Section shall be clean, well-graded sand or sand/gravel mixture with a maximum particle size of 5/8 inch, entirely free of clay, silt, organic or deleterious matter and frozen material. Minimum material weight shall be 110 pounds per cubic foot at 95% relative compaction. Bedding shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing*</u>
3/4" Square	100
3/8" Square	95-100
U.S. No. 8	0-10
U.S. No. 200	0-3
Sand Equivalent	35 MIN.

\*All percentages are by weight. Native Material may not be used for bedding.

**B. Copper, PEX and PVC Less Than 4" Diameter Water Service Pipe**

All requirements of 6.04 (F) herein apply, except that bedding material shall be clean sand, free of gravel, with no more than 5% passing the No. 200 Sieve (by weight).

**6.05 Water Pipe Testing & Disinfecting**

All pipelines shall be hydrostatically tested and disinfected per current applicable AWWA and WSDOT/APWA Standards prior to acceptance of work. A water hydrant meter shall be required and procured from the City for all water utilized for flushing pipelines. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Contractor. Feed for the pump shall be disinfected treated water from a barrel or other container within the actual amount of "makeup" water, so that it can be

measured periodically during the test period. Contractor shall not transport make up water in trucks.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking.

As soon as pipe is secured against movement under pressure, it may be filled with water. Satisfactory performance of air valves shall be checked while the line is filling.

Contractor shall pre-flush to a City approved location all water mains after water has remained in the main for 24 hours and no more than 36 hours before flushing the main. A bacteria sample must come back satisfactory before pressure testing of main can be performed.

After the pipe is filled and all air expelled, it shall be pumped to a test pressure of 250 psi or the pressure classification of the pipe, whichever is less. Test pressure shall be maintained for a period of not less than 30 minutes to insure the integrity of the thrust and anchor blocks. The Contractor/Developer is cautioned regarding pressure limitations on butterfly valves. All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Hydrostatic tests shall be performed on every complete section of water main between two valves, and each valve shall withstand the same test pressure as the pipe with no pressure active in the section of pipe beyond the closed valve.

**TEST WORK SHEET FOR WATER LINES**

# **HYDROSTATIC AND LEAKAGE TEST**

**Project Name** \_\_\_\_\_

**Date** \_\_\_\_\_ **Job No.** \_\_\_\_\_

**Location of Test/Stationing** \_\_\_\_\_

**Contracting Agency** \_\_\_\_\_

## **Hydrostatic Test**

**Test Pressure** \_\_\_\_\_

**Time Test Started** \_\_\_\_\_

**Time Test Completed** \_\_\_\_\_

**Total Time** \_\_\_\_\_ **minutes**

**Test Passed**  **Yes**

**No**

Defective materials or workmanship, discovered as a result of the tests, shall be replaced by the Contractor at the Contractor's expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be re-run at the Contractor's expense until a satisfactory test is obtained.

As sections of pipe are constructed and before pipelines are placed in service, they shall be thoroughly flushed and disinfected in accordance with DOH requirements and ANSI/AWWA C651.92 and C652.92. These requirements shall be supplemented with the additional information detailed below.

The Contractor shall be responsible for flushing all water mains prior to water samples being acquired. The water mains shall be flushed at a rate to provide a minimum 2.5 feet per second velocity in the main.

In all disinfection processes, the Contractor shall take particular care in flushing and wasting the chlorinated water from the water mains. The disposal of any water containing chlorine shall be performed in accordance with AWWA C651, Section 01100, and any other local requirements. Additionally, the Contractor shall ensure that the chlorinated water does no physical or environmental damage to property, streams, storm sewers or any waterways. The Contractor shall chemically or otherwise treat the chlorinated water to prevent damage to the affected environment, particularly aquatic and fish life of receiving streams.

Chlorine shall be applied in one of the following manners, listed in order of preference, to secure a concentration in the pipe of at least 50 ppm.

- 1) Injection of chlorine-water mixture from chlorinating apparatus through corporation cock at beginning of section after pipe has been filled, and with water exhausting at end of section at a rate controlled to produce the desired chlorine concentration;
- 2) Injection similarly of a hypochlorite solution;
- 3) Placement of dry chlorinated lime throughout pipeline, as constructed, in proper quantities to produce the desired dosage. Filling of pipeline with this method should be at a very slow rate. Pipeline should be filled within two days of placing sterilizing agent.

After the desired chlorine concentration has been obtained throughout the section of line, the water in the line shall be left standing for a period of 24 hours. Following this, the line shall be thoroughly flushed and a water sample collected. The line shall not be placed in service until a satisfactory bacteriological report has been received and must be flushed within 36 hours of filling.

City forces only will be allowed to operate existing and new tie-in valves. The Contractor's forces are expressly forbidden to operate any valve on any section of line that has been accepted by the City.

#### **6.06 Backflow Prevention**

1. All water systems (i.e. sprinkler systems, swimming pools, laboratories, car washes, funeral homes, or at direction of the Building Department and Public Works Department) connected to the public water system shall have backflow prevention as required by WAC 248-54-285.
2. All fire sprinkler systems that have a fire department connection shall have backflow prevention as required by WAC 248-54-285.
3. All water systems that have access to a non-potable water system shall have a backflow prevention device on potable service.

#### **6.07 Staking**

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor directing and/or performing such work shall be currently licensed by the State of Washington to perform said tasks. A preconstruction meeting shall be held with the City prior to commencing staking and notification will be given to the City that the staking is complete prior to beginning construction for their review. The minimum staking of water systems shall be as follows:

- A. Provide staking sufficient to satisfy Public Works Director. In new plat development, roadway centerline staking must be readily identifiable.
- B. Stake locations of all proposed fire hydrants, blow-offs, air-vacs, valves, meters, etc.

#### **6.08 Trench Excavation**

- A. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.
- B. Trenches shall be excavated to the line and depth designated by the City to provide a minimum of 36 inches of cover over the pipe. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency and in compliance with all safety requirements of the prevailing agencies. See Detail. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not

to enter the trench. The Contractor shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.

- C. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth six inches below the pipeline grade. Where materials are removed from below the pipeline grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.
- D. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City, and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.
- H. The bedding course shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

#### **6.09 Backfilling**

Native material for backfill: Material must be free of wood waste, debris, clods or rocks greater than three inches in any dimension. Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected material shall be placed and compacted around and under the pipe by hand tools. Special precautions should be provided to protect the pipe to a point 12 inches above the crown of the pipe. The remaining backfill shall be compacted to 95 percent of the maximum density in traveled areas and road prisms, 95 percent outside driveway, roadways, road prism, shoulders, parking or other traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. Typically, all trenches located in roadway sections, roadway "prisms", and in traffic bearing areas shall be required to be backfilled and compacted with crushed surfacing top course. Due to local conditions, as may be specifically approved by the City, suitable excavated backfill material, as determined by the City, may be utilized as backfill, or if such material is not available from trenching operations, the City may order the placing of gravel base conforming with Section 9-03.10 of the WSDOT Standard Specifications for backfilling the trench. All excess material shall be promptly loaded and hauled to waste.

#### **6.10 Street Patching and Restoration**

See Chapter 5 of Public Works Standards for requirements regarding street patching.

## **6.11 Erosion Control**

The detrimental effects of erosion and sedimentation shall be minimized by conforming to the following general principles:

1. Soil shall be exposed for the shortest possible time.
2. Reducing the velocity and controlling the flow of runoff.
3. Detaining runoff on the site to trap sediment.
4. Releasing runoff safely to downstream areas.

In applying these principles, the Developer and/or Contractor shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop materials; providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible.

### **A. Trench Mulching**

Where there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, backfill material shall be compacted and held in place by covering the disturbed area with straw and held with a covering of jute matting or wire mesh anchored in place.

### **B. Cover-Crop Seeding**

A cover crop shall be sown in all areas excavated or disturbed during construction that were not paved, landscaped and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original or superior condition.

Cover crop seeding shall follow backfilling operations.

The Developer and/or Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be re-seeded if required and additional measures taken to provide protection from erosion until the cover crop are capable of providing protection.

During winter months, the Contractor may postpone seeding, if conditions are such that the seed will not germinate and grow. The Developer and/or Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown and affords protection from erosion.

The cover crop shall be sown at a rate of 10 to 15 pounds of seed per acre using a hand or power operated mechanical seeder capable of providing a uniform distribution of seed.

## 6.12 Finishing and Cleanup

After all other work on this project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections of a new roadway consistent with the original section, and as hereinafter specified.

On water system construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that upon completion the area will present a uniform appearance, blending into the contour of the adjacent properties. All other requirements outlined previously shall be met.

Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished with a grading machine to the required cross section and grade, so long as such means do not damage existing improvements, trees, and shrubs. Machine dressing shall be supplemented by handwork to meet requirements outlined herein, to the satisfaction of the Public Works Director.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade. Where the existing surface is below sidewalk and curb, the area shall be filled and dressed out to the walk. Wherever fill material is required in the planting area, the finished grade shall be elevated to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

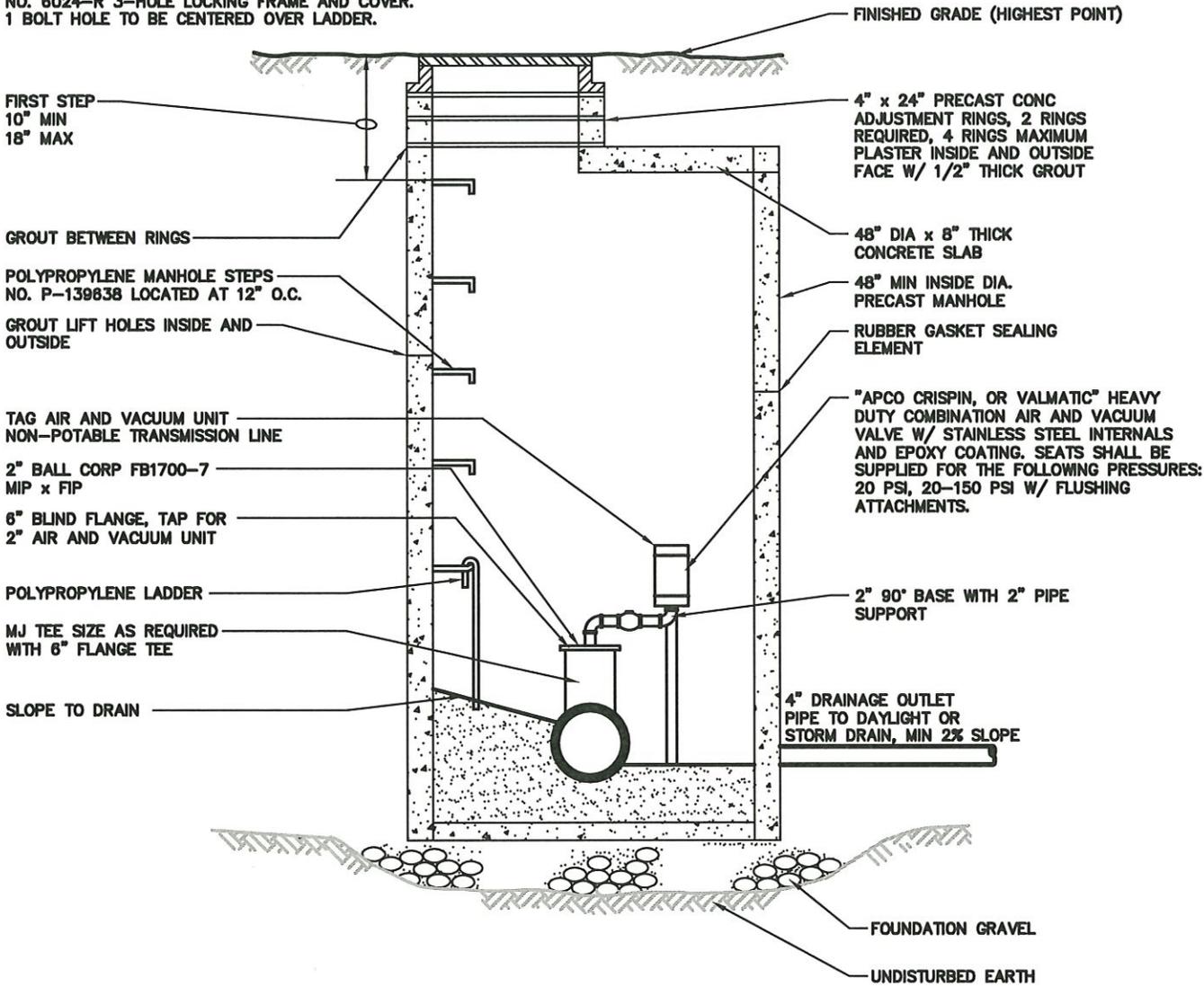
All rocks in excess of 3-inches in diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform, natural, well-sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed to a permitted site capable of handling this material and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer and/or Contractor shall remove and dispose of same and restore said disturbed areas at his own expense.

Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris, which is the result of the Developer and/or Contractor's operations. All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities, which have been sprayed by the asphalt cement, shall be cleaned to the satisfaction of the Public Works Director.

Castings for monuments, water valves, vaults and other similar installations, which have been covered with the asphalt material, shall be cleaned to the satisfaction of the Public Works Director.

MANHOLE FRAME AND COVER WITH "SEWER" OR "WATER" LINES, AS THE CASE MAY BE, CAST ON COVER WITH 3" HIGH RAISED LETTERS (NON-SKID PATTERN) AS MANUFACTURED BY "SATHER MANUFACTURING CO. INC." NO. 8024-R 3-HOLE LOCKING FRAME AND COVER. 1 BOLT HOLE TO BE CENTERED OVER LADDER.



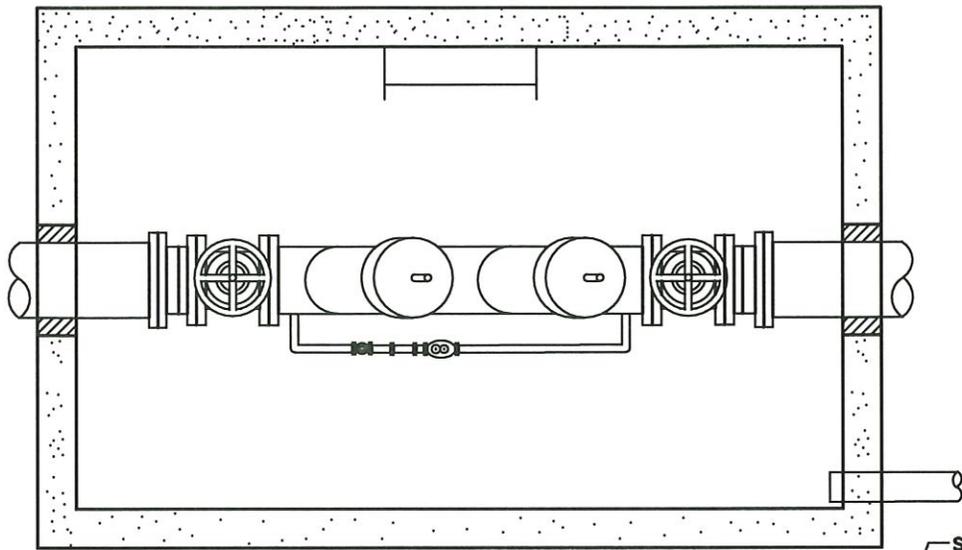
**NOTE:**  
ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
STANDARD DETAILS  
AIR AND VACUUM RELEASE ASSEMBLY  
FIGURE W1-SHEET 1

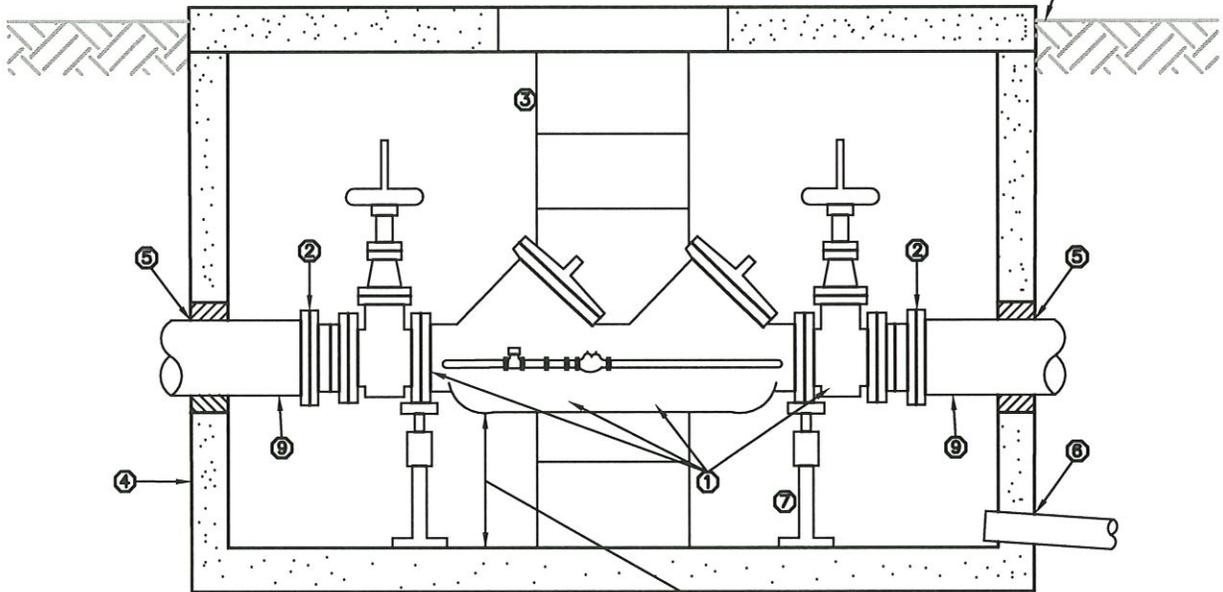
#1	November, 2014
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PLAN

SET VAULT 1" ABOVE FINISHED GRADE



ELEVATION

MINIMUM 36" CLEARANCE FROM VAULT FLOOR

**NOTES:**

- ① WATTS MODEL 709 DCDA DOUBLE CHECK DETECTOR ASSEMBLY OR EQUAL
- ② UNI-FLANGE WITH SET SCREWS.
- ③ POLYPROPYLENE LADDER TO BE SECURED TO VAULT OR POLYPROPYLENE MANHOLE STEPS @ 12" ON CENTER.
- ④ CONCRETE VAULT (5'x9'x7'-2" INSIDE DIMENSIONS) WITH BLCO COVER (H2O LOADING) DOUBLE LEAF DESIGN.
- ⑤ WATER TIGHT GROUT. RESTRAINT INLET/OUTLET PIPE WITH WELDED FLANGE OR SHACKLE TO THRUST BLOCK TO PREVENT. SHACKLE THROUGH VAULT IF CHECK VALVE ASSEMBLY IS REMOVED.
- ⑥ 4" DRAIN TO DRYWELL.
- ⑦ ADJUSTABLE PIPE STANCHION, GRINELL PIPE SUPPORTS.
- ⑧ VALVE ASSEMBLY TO BE CENTERED IN VAULT
- ⑨ CL. 53 D.I. MJ WITH MEGALUGS.

**GENERAL NOTES:**

- 1. ASSEMBLY SHALL BE MAINTAINED BY PROPERTY OWNER AND ANNUAL CERTIFICATION REQUIRED.
- 2. FIRELINE SHALL NOT BE PUT INTO SERVICE UNTIL THE BACKFLOW PREVENTION DEVICE IS APPROVED BY THE DISTRICT.
- 3. A REDUCED PRESSURE BACKFLOW PREVENTION DEVICE MAY BE REQUIRED BY THE DIRECTION OF THE CITY.
- 4. PAINT PIPING WITH MARKER PAINT MARINE ENAMEL. MARATHON 1085, TAHOE BLUE.
- 5. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
 STANDARD DETAILS  
 DOUBLE CHECK DETECTOR ASSEMBLY  
 FIGURE W2-SHEET 1

#1	November, 2014
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BACKFLOW PREVENTER  
(DOH APPROVED)

HOT BOX (NE FLORIDA  
ENTERPRISES INC.  
MODEL NO. 1NYO  
ENCLOSURE W/ LOCK  
PRE CITY STANDARDS

120V ELECTRICAL OUTLET  
FOR HEAT TAPE

3/8"x4" ANCHOR  
BOLTS PER  
MANUFACTURER

CONCRETE SLAB  
(3000 PSI)

FINISH GRADE

6" MIN FREE  
DRAINING  
GRAVEL

CONNECT TO  
WATER METER

RESTRAINED JOINT  
PIPE (SIZE AS REQD.  
AND APPROVED BY  
CITY

CENTER BACKFLOW  
PREVENTER IN HOT  
BOX

DRAIN

6x6-W2.9xW2.9 WWF  
(WELDED WIRE FABRIC)

TO ELECTRICAL PANEL  
DIRECT BURIAL OR IN  
RIGID CONDUIT PER CITY  
REQUIREMENTS

FINISH GRADE

**NOTES:**

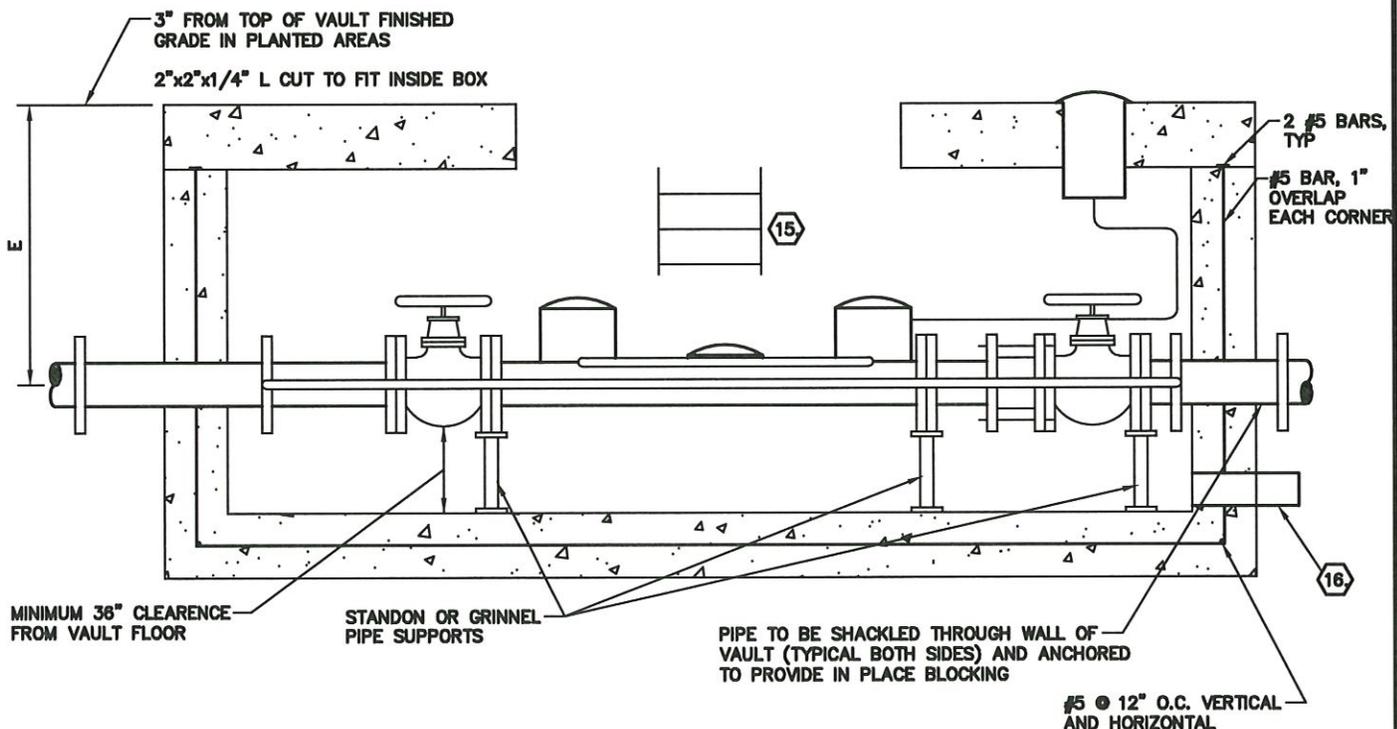
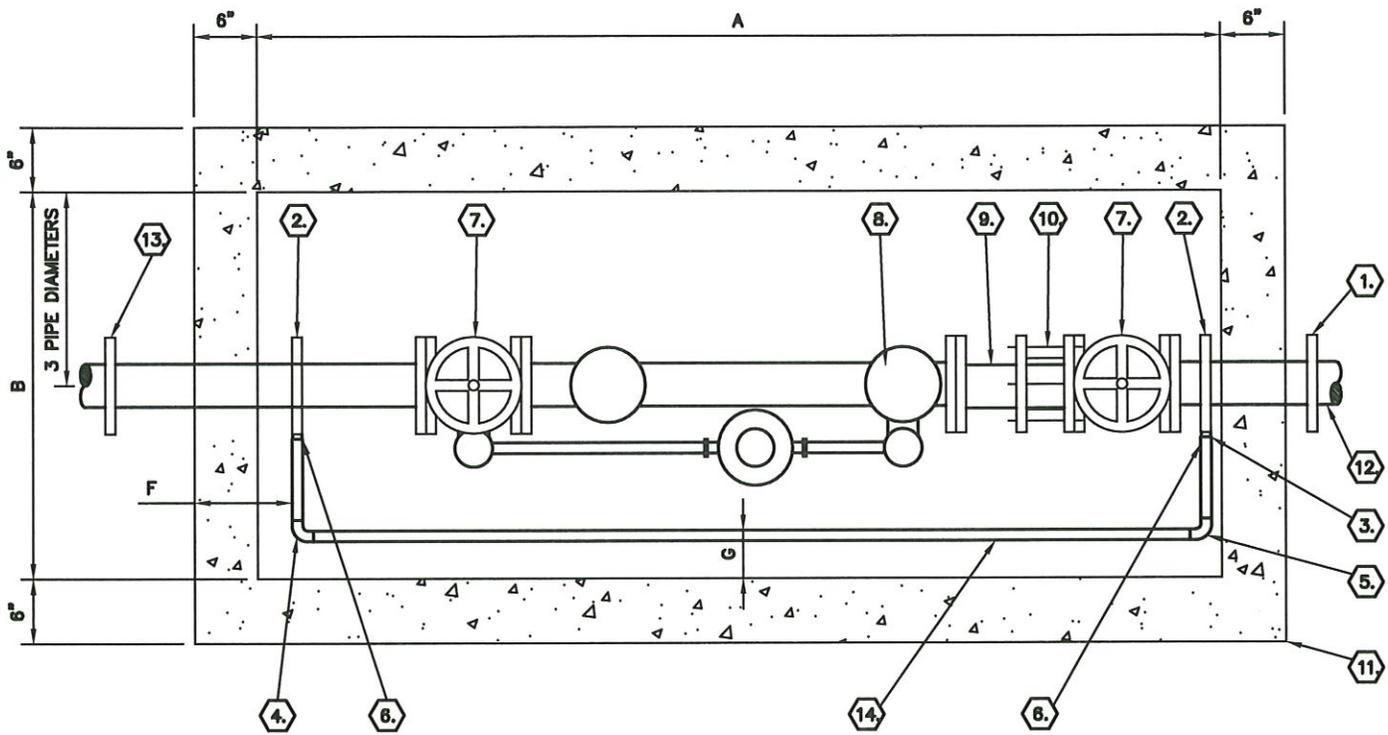
1. PROVIDE CITY APPROVED SUPPORT FOR 2 1/2" AND LARGE DEVICES.
2. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
STANDARD DETAILS  
REDUCED PRESSURE BACKFLOW DEVICE  
FIGURE W2-SHEET 2

#1	November, 2014
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**NOTES:**

1. INSTALL 4" DRAIN PIPE TO DRYWELL
2. BACKFLOW PREVENTOR REQUIRED FOR ALL FIRE LINES AND IRRIGATION LINES, IN SEPARATE VAULTS OR IN BUILDINGS AS PER CITY APPROVAL
3. BRASS DOES NOT NEED TO BE PAINTED, ALL OTHER PIPE TO BE PAINTED WITH MARINE ENAMEL, MARATHON 1085 TAHOE BLUE.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

RADIO READ HEAD NEEDS TO EXTEND THROUGH THE LID OF THE BOX, AS PER THE MANUFACTURER RECOMMENDATION.

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**CITY OF OTHELLO**  
STANDARD DETAILS  
METER AND METER VAULT ASSEMBLY (3" THROUGH 10")  
FIGURE W3-SHEET 1

#1	November, 2014
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**MATERIAL LIST**

1. 2-FLEX CPLG TO FIT ROCKWELL 441 (4"x3" REDUCER, MJ FOR 3" METER)
2. 2-DOUBLE STRAP SERVICE (STAINLESS STEEL BAND) ROMAC 101 WITH IPS TAP, OR EQUAL
3. 3-STRAIGHT CPLG BRASS TO OUTSIDE I.P. THREAD MUELLER H-15425, H-15428 110 COMP., OR EQUAL
4. 1 1/4" BEND CPLG, BRASS TO BRASS, FORD.
5. 1 1/4" BEND CPLG, BRASS TO OUTSIDE I.P. THREAD MUELLER H-15530, OR EQUAL
6. 1 BALL VALVE WITH PADLOCK WING OFF OF SADDLE OR DIRECT MAIN TAP.
7. 2-RESILIENT SEAT GATE VALVE, FLxFL, (RISING STEM).
8. 3" TO 10" COMPOUND METER WITH STRAINER, SIZE TO BE #1 BADGER RADIO READ AS SPECIFIED BY CITY AND FURNISHED BY CONTRACTOR/DEVELOPER.
9. 14 DI ADAPTER, FLxPE (LENGTH TO FIT).
10. 1-CPLG ADAPTER., FL ROCKWELL 912, OR OWNER APPROVED.
11. CAST IN PLACE OR PRECAST CONCRETE VAULT WITH (H2O) BILCO (HATCH SIZE AND LOCATION TO BE APPROVED BY THE CITY).
12. WELDED FL RESTRAINT OR SHACKLE TO THRUST BLOCK TO PREVENT MOVEMENT IF METER IS REMOVED.
13. INSULATED CPLG TO 3" CU SERVICE.
14. UNION.
15. INSTALL POLYPROPYLENE STEPS WITH TELESCOPIC RISER, FASTEN TO WALL WITH STAINLESS STEEL FASTENERS AT MAXIMUM ONE FOOT INTERVALS.
16. PROVIDE 4" DRAIN PIPE (AT PUMP) TO DAYLIGHT, MIN. SLOPE = 2%.
17. WATER METER LAY LENGTH IN PIT WITH SCREEN (5 TIMES PIPE DIA. UP STREAM 3 TIMES DOWN STREAM PIPE DIA.) STRAIGHT PIPE.

**NOTES:**

1. METERS SHALL BE AS REQUIRED BY THE CITY (RADIO READ BADGER) METERS SHALL READ IN CUBIC FEET.
2. VAULT SHALL BE PRECAST. UTILITY VAULT OR CITY APPROVED EQUAL.
3. ALL PIPE AND FITTINGS 4" AND LARGER SHALL BE DUCTILE IRON.
4. PIPING FROM MAIN TO TO VAULT SHALL BE AS SHOWN IN THE TABLE BELOW. PROVIDE TEE WITH VALVE ON DISTRIBUTION MAIN.
5. ALL PIPING SHALL BE PAINTED (TWO COATS) WITH PARKER PAINT MARINE ENAMEL, MARATHON 1065. TAHOE BLUE.
6. BACKFLOW DEVICE REQUIREMENT SHALL BE DETERMINED BY THE CITY.
7. ALL PROPOSALS ARE TO BE APPROVED BY THE CITY.
8. RADIO READ HEAD TO EXTEND THROUGH THE PIT LID AS PER MANUFACTURER RECOMMENDATION.

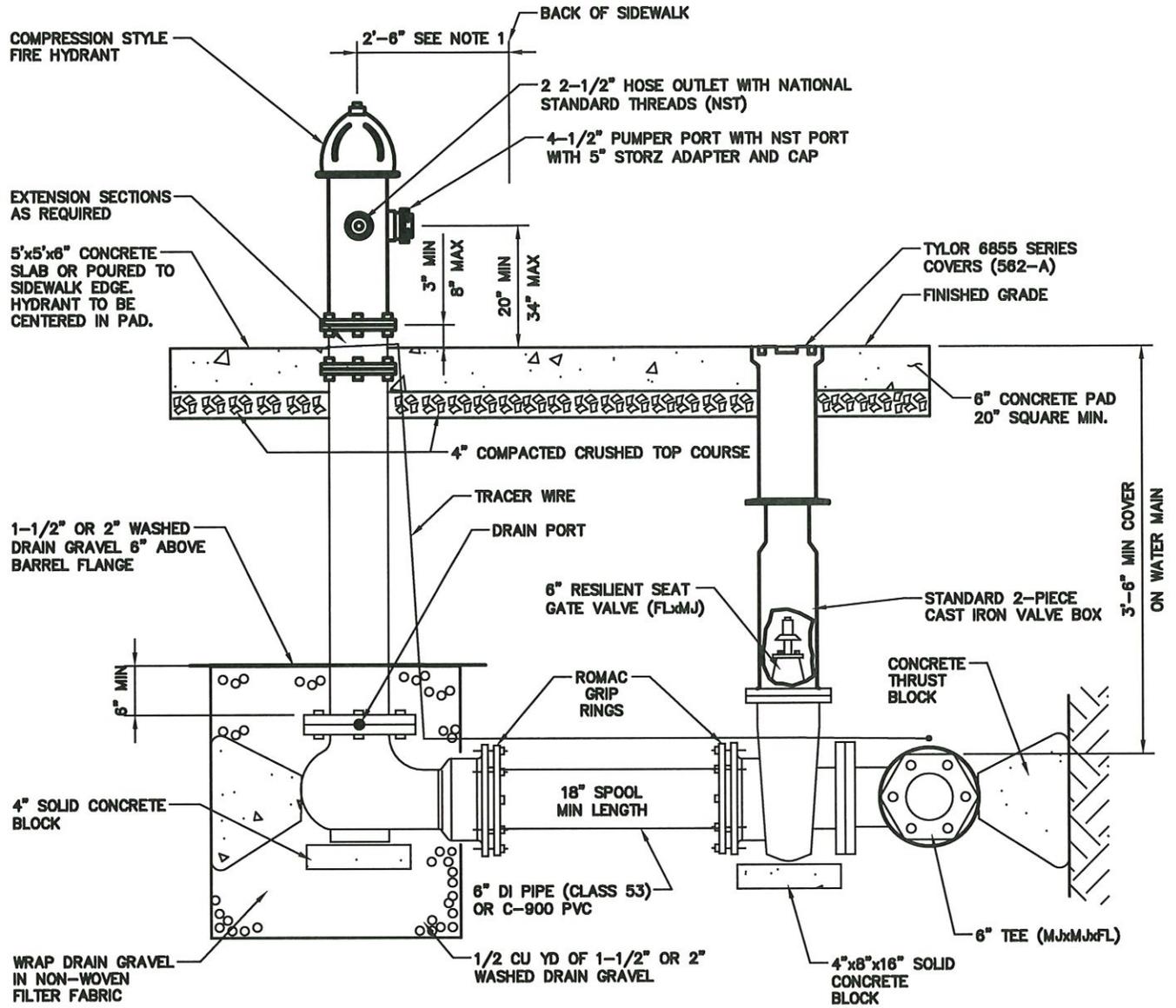
METER SIZE	MAIN-LINE	BYPASS	A	B	C	D	E	F	G
3"-4"	4" DI	1-1/2" BRASS	7'-6"	3'-0"	9-1/2"	6"	2'-8"	9"	4'
6"	6" DI	2" BRASS	9'-6"	3'-6"	12"	6"	2'-8"	9"	4"
8'	8" DI	4" DI	11'-0"	4'-0"	12"	9"	3'-6"	14"	6"
0'-10"	10" DI	4" DI	13'-0"	5'-0"	16"	12"	4'-0"	16"	8"

**NOTE:**

ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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<b>CITY OF OTHELLO</b> STANDARD DETAILS METER AND METER VAULT ASSEMBLY (3" THROUGH 10") FIGURE W3-SHEET 2	#1	November, 2014	
	#2	June, 2016	
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**NOTES:**

1. 2'-6" FROM BACK OF SIDEWALK OR 6' FROM BACK OF CURB OR 3' INSIDE RIGHT-OF-WAY.
2. PROVIDE 8" PIPE SIZE IF OVER 60' FROM MAINLINE.
3. PROVIDE MIN. 5' CLEAR AND LEVEL AREA AROUND HYDRANT. 2'-6" ALL AROUND MEASURED FROM OPERATOR NUT. GUARD POSTS REQUIRED IF IN PARKING AREA OR IF CONSIDERED A HAZARDOUS AREA AND DEEMED NECESSARY BY THE CITY.
4. PAINT FIRE HYDRANT AND GUARD POSTS WITH TWO (2) COATS YELLOW PAINT AFTER INSTALLATION.
5. FIRE HYDRANT SHALL BE WATEROUS WB67250, MH929, IF APPROVED BY PUBLIC WORKS DIRECTOR.
6. FOR OTHER SPECIFICATIONS, USE WSDOT/APWA STANDARD SPECIFICATIONS.
7. A 5'x5'x6" CONCRETE PAD REQUIRED AROUND THE HYDRANT.
8. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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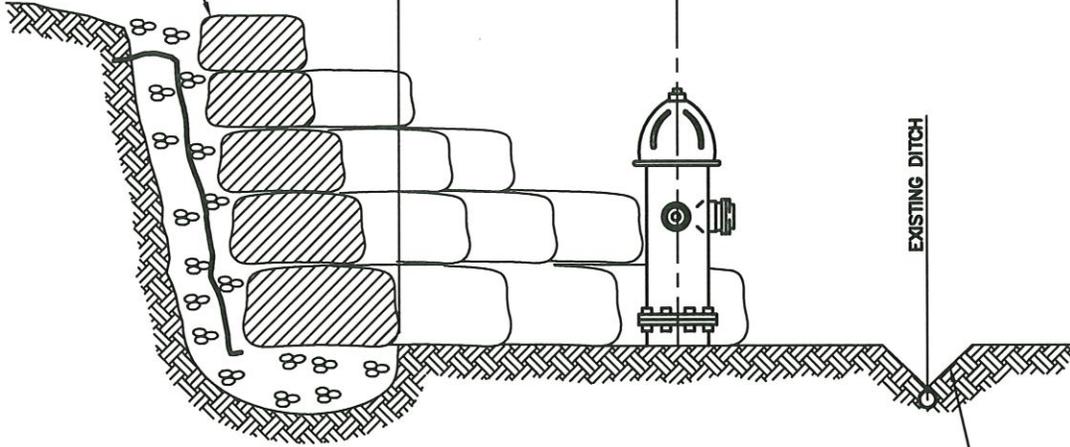
CITY OF OTHELLO  
STANDARD DETAILS  
FIRE HYDRANT ASSEMBLY  
FIGURE W4-SHEET 1

#1	November, 2014
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ROCK RETAINING WALL

LEVEL ALL AROUND  
MIN 5' RADIUS

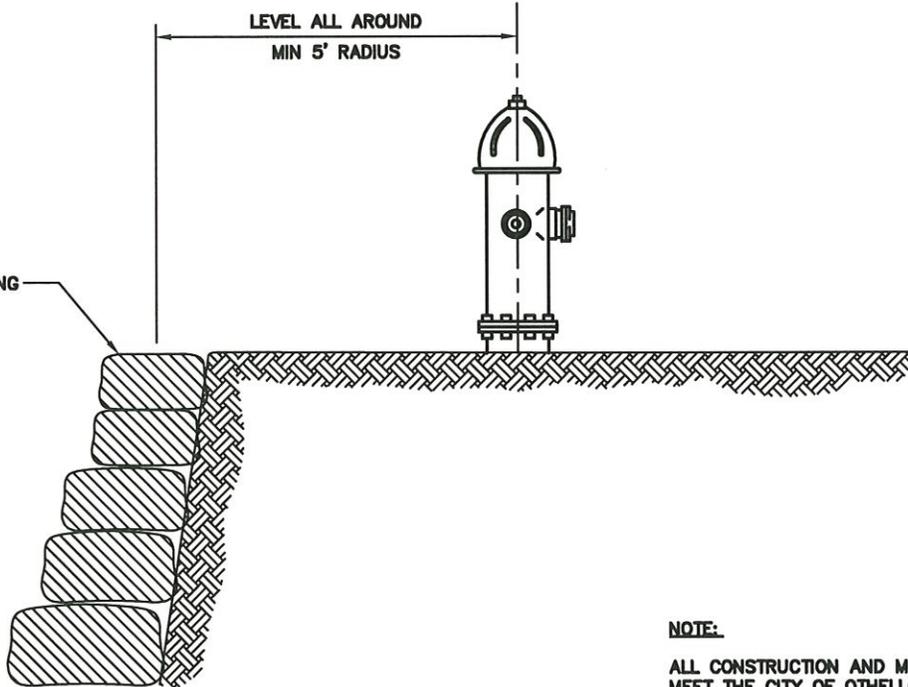


CUT

PROVIDE MINIMUM 12" CULVERT  
(15' MINIMUM LENGTH) SIZE  
MAY BE SIGNIFICANTLY GREATER  
BASED ON LOCAL CONDITIONS

LEVEL ALL AROUND  
MIN 5' RADIUS

ROCK RETAINING WALL



FILL

**NOTE:**

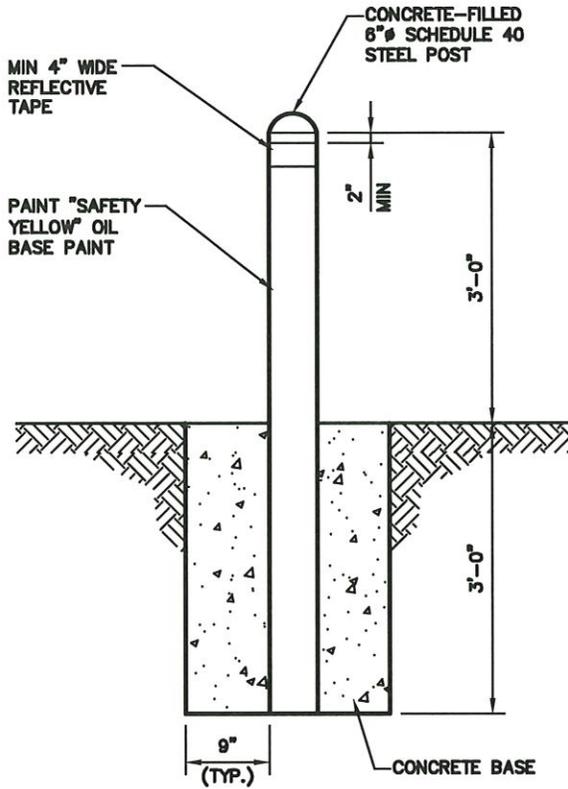
ALL CONSTRUCTION AND MATERIALS SHALL  
MEET THE CITY OF OTHELLO'S DESIGN  
STANDARDS AND BE APPROVED BY THE CITY.

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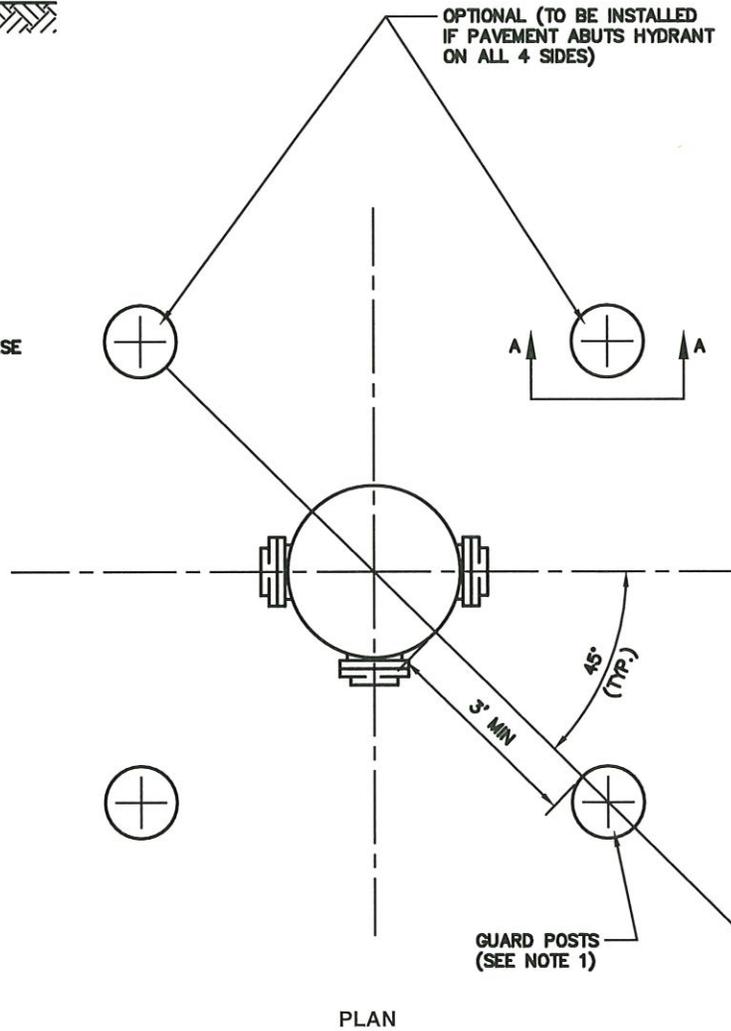
CITY OF OTHELLO  
STANDARD DETAILS  
FIRE HYDRANT LOCATION IN CUT OR FILL  
FIGURE W4-SHEET 2

#1	November, 2014
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SECTION A-A



GUARD POSTS  
(SEE NOTE 1)

PLAN

**NOTES:**

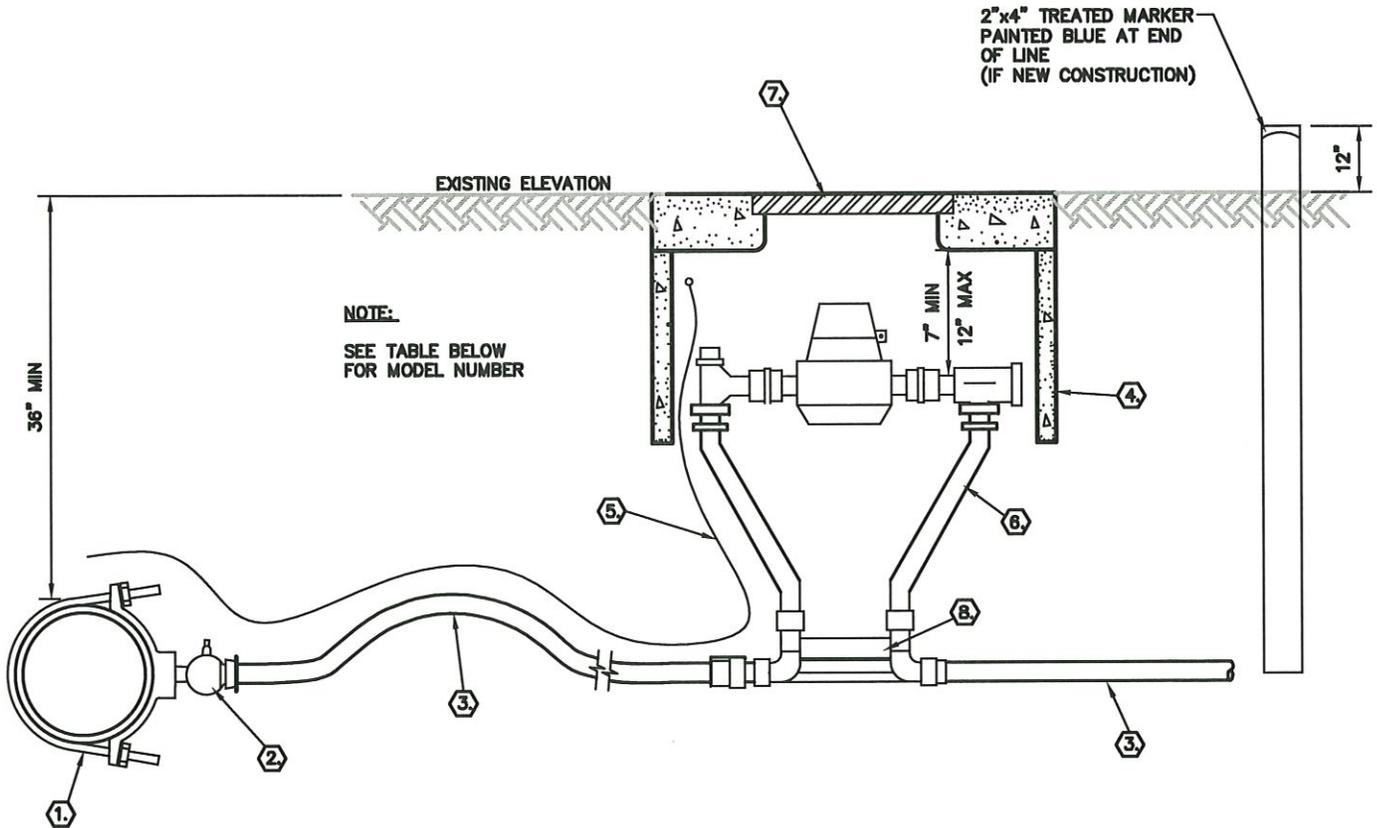
1. WHERE CONCRETE CURBING IS NOT INSTALLED, GUARD POSTS (2 EA. MIN) SHALL BE INSTALLED ON SIDE FACING PAVED SURFACE.
2. GUARD POSTS TO BE PAINTED SAME AS HYDRANT.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
HYDRANT GUARD POSTS  
FIGURE W4-SHEET 3

#1	November, 2014
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**NOTE:**  
SEE TABLE BELOW  
FOR MODEL NUMBER

DESCRIPTION, ALL NEW CONSTRUCTION	MAKE OR RATING	1"
1. STAINLESS BAND/EPOXY COAT	FORD OR EQUAL	202S-905x1IP
2. CORP STOP/BALL VALVE	FORD OR EQUAL	FB 1100-4Q
3. COPPER PIPE WITH 3' PIGTAIL		TYPE K
4. METER BOX, 24" DEPTH MIN.	OLD CASTLE	1324BCF
5. TRACER WIRE THHN	CU SOLID WIRE	10 GAUGE
6. METER SETTER	FORD OR EQUAL	VBH74-24W-44-44-Q
7. LID METAL (D.I. MAX VIEW COVER)	OLD CASTLE	
8. TIE BAR	FORD OR EQUAL	

**NOTES:**

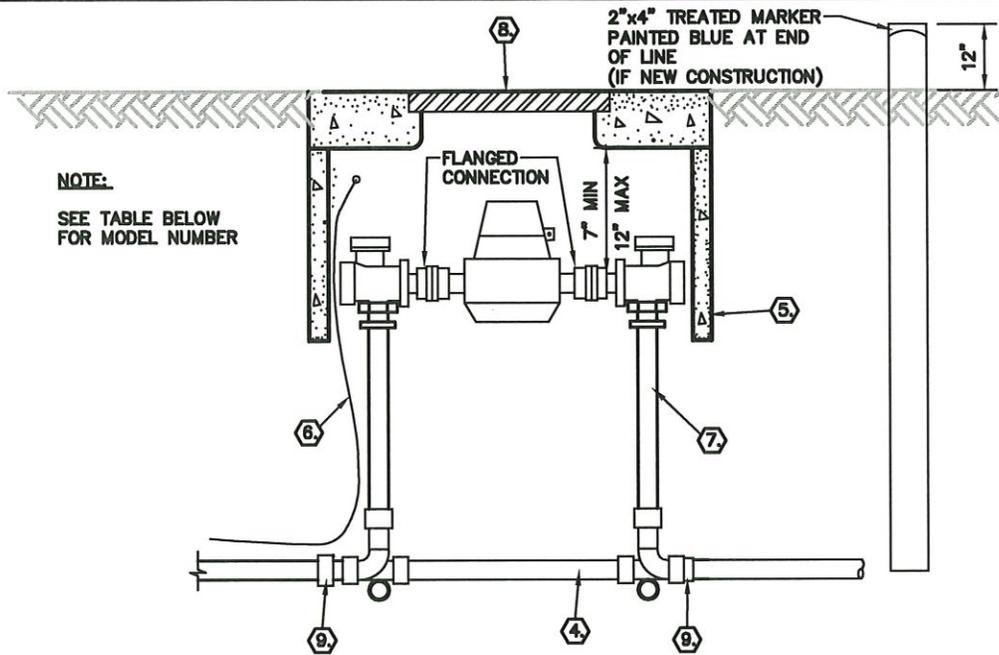
- CONTRACTOR SHALL MAKE COMPLETE CONNECTION IN GOOD WORKING ORDER AND SHALL PROVIDE ALL NECESSARY FITTINGS, COUPLINGS, ETC.
- CONTRACTOR TO NOTIFY THE CITY OF ANY EXISTING DAMAGED METER BOXES PRIOR TO ANY EXCAVATION FOR THESE SERVICE CONNECTIONS. ANY DAMAGE AS A RESULT OF THE CONTRACTORS WORK SHALL RESULT IN NEW METER BOXES OF EQUAL TYPE AND MATERIAL TO BE INSTALLED AT THE CONTRACTORS EXPENSE.
- ANY DAMAGE DONE TO EXISTING METERS AS A RESULT OF THE CONTRACTORS OPERATIONS SHALL BE REPAIRED BY THE CITY'S PERSONNEL AND ALL COSTS OF REPAIR OR REPLACEMENT, IF NECESSARY, SHALL BE PAID BY THE CONTRACTOR.
- ALL FITTINGS SHALL BE BRASS.
- TRACER WIRE FROM MAIN TO SERVICE METER SHALL BE INSTALLED IN ALL INSTALLATIONS. WIRE SHALL BE VISIBLE IN SERVICE METER BOX.
- ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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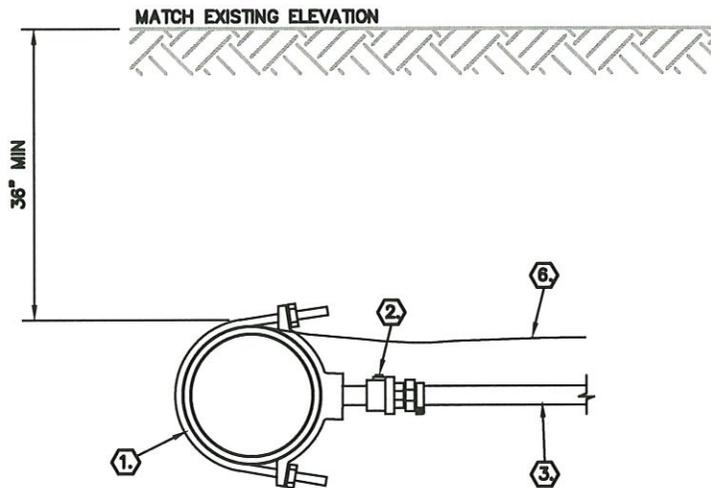
**CITY OF OTHELLO**  
STANDARD DETAILS  
1" WATER SERVICE W/ METER SETTER  
FIGURE W5-SHEET 1

#1	November, 2014
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NOTE:  
SEE TABLE BELOW  
FOR MODEL NUMBER



DESCRIPTION, ALL NEW CONSTRUCTION	MAKE OR RATING	1-1/2"	2"
1. DOUBLE STRAP STAINLESS STEEL BAND	ROMAC OR EQUAL	202 IPT	202 IPT
2. CORPORATION STOP	FORD OR EQUAL	FB 1102-6	FB 1102-7
3. SCHEDULE 80 PVC/ BLUE PEX WITH CRUSH SLEEVES			
4. TIE BAR	FORD OR EQUAL		
5. METER BOX, 24" DEPTH REQ. MIN	OLD CASTLE	1730BCF	1730BSF
6. TRACER WIRE THHN	10 GA COPPER WIRE	SOLID	SOLID
7. METER SETTER	FORD OR EQUAL	VBH76-44-77-66	VBH77-44-77-77
8. LID METAL (D.I. MAX VIEW COVER)	OLD CASTLE		
9. COUPLING	FORD OR EQUAL	C87-66	C87-77

**NOTES:**

- THE SERVICE LINE TO LOTS OVER 16,000 SF SHALL CONSIST OF 2" COPPER OR 2" RIGID SCHEDULE 80. THE 2" LINE SHALL TERMINATE WITH A 2" BALL VALVE 3' FROM THE STREET RIGHT-OF-WAY LINE INCLUDING A TRACER WIRE CONNECTED TO THE WIRE ON TOP OF THE LINE AND EXTENDING UP THE TREATED 2"x4" MARKER BURIED AT THE END OF BALL VALVE. BEDDING MATERIAL SHALL BE SAND.
- ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

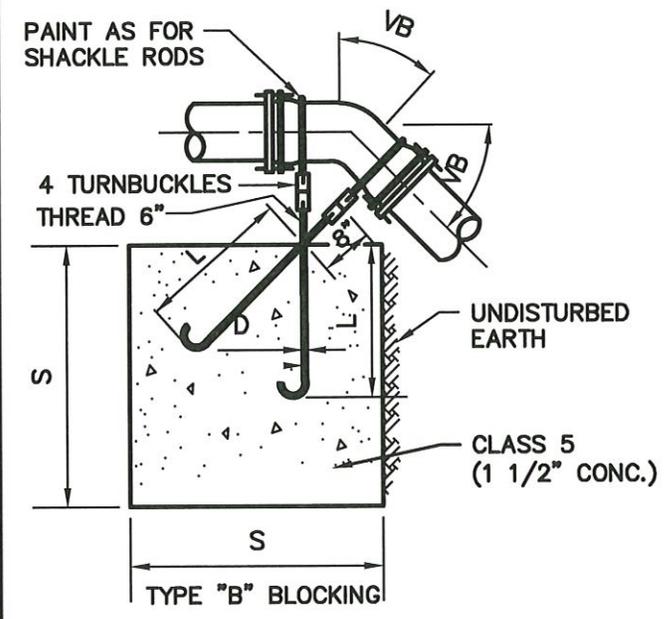
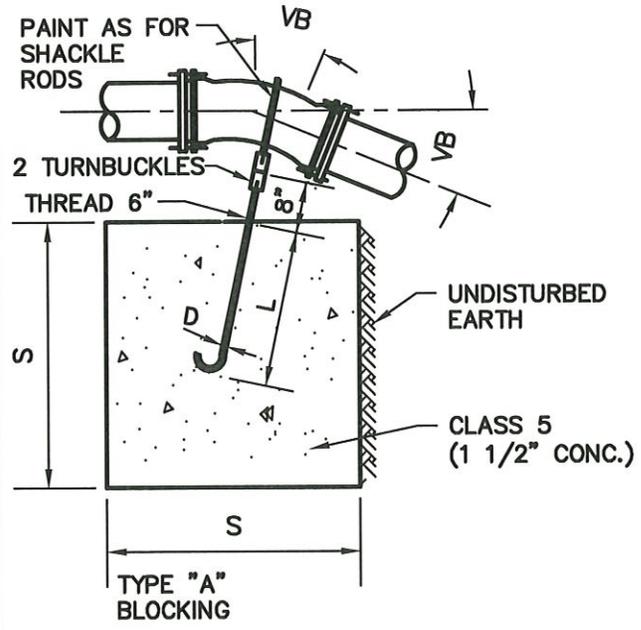
CITY OF OTHELLO  
STANDARD DETAILS  
1-1/2" & 2" WATER SERVICE  
FIGURE W5-SHEET 2

#1	November, 2014
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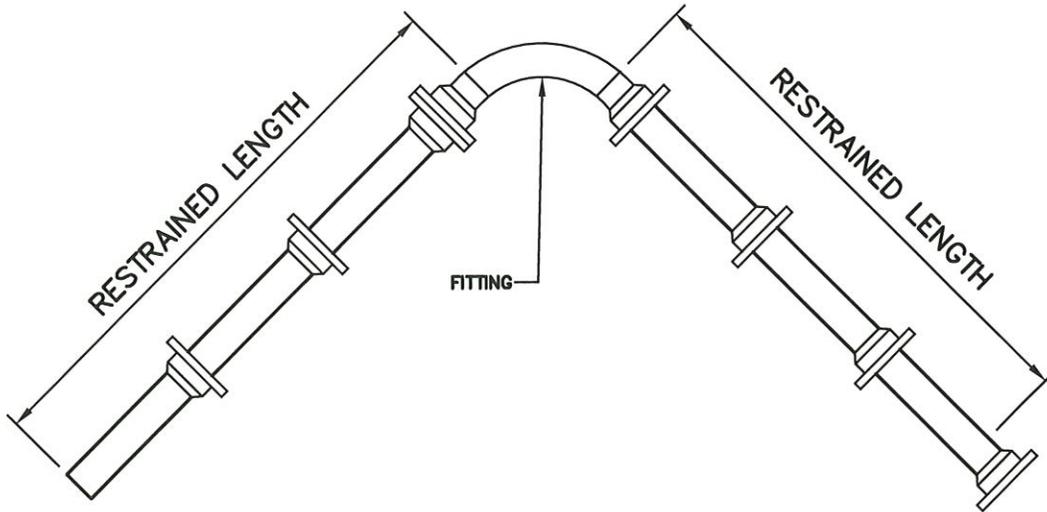
TYPE "A" BLOCKING						
FOR 11 1/4°-22 1/2° VERTICAL BENDS						
PIPE SIZE NOMINAL DIAMETER - INCHES	TEST PRESSURE PSI	VB		S	D	L
		VERTICAL BEND DEGREES	No. OF CU. FT. OF CONC. BLOCKING			
4"	300	11 1/4	8	2	5/8"	1.5
		22 1/2	11	2.2		2.0
6"	300	11 1/4	11	2.2	5/8"	2.0
		22 1/2	25	2.9		
8"	300	11 1/4	16	2.5	5/8"	2.0
		22 1/2	47	3.6		
12"	250	11 1/4	32	3.2	5/8"	2.0
		22 1/2	88	4.5		
16"	225	11 1/4	70	4.1	7/8"	3.0
		22 1/2	184	5.7		
20"	200	11 1/4	91	4.5	7/8"	3.0
		22 1/2	225	6.1		
24"	200	11 1/4	128	5.0	1"	3.5
		22 1/2	320	6.8		
TYPE "B" BLOCKING						
FOR - 45° VERTICAL BENDS						
		VB		S	D	L
4"	300	45	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		232	6.1	3/4"	2.5
16"	225		478	7.8	1 1/8"	4.0
20"	200		560	8.2	1 1/4"	
24"			820	9.4	1 3/8"	4.5



**NOTES:**

1. THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPERS ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN AND SIZING OF ALL BLOCKING BASED ON SOIL CONDITIONS, TEST PROCEDURES, AND OTHER RELEVANT CONSIDERATIONS.
2. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

<b>CITY OF OTHELLO</b> STANDARD DETAILS ANCHOR BLOCK DETAIL FIGURE W6-SHEET 1	#1	November, 2014	
	#2	June, 2016	
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PIPE SIZE	90° BEND	45° BEND	22 1/2°	11 1/4°	TEE OR DEAD END CAP
	RESTRAINED LENGTH IN FEET				
4"	40	17	8	4	30
6"	55	23	11	6	39
8"	73	31	15	8	53
10"	88	37	18	9	67
12"	103	43	21	10	82
16"	133	55	27	13	110
18"	145	60	29	15	124

**NOTES:**

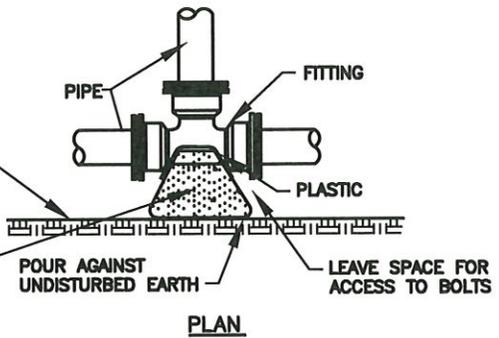
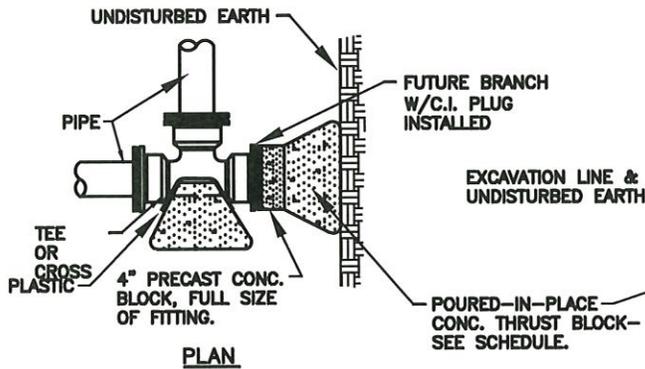
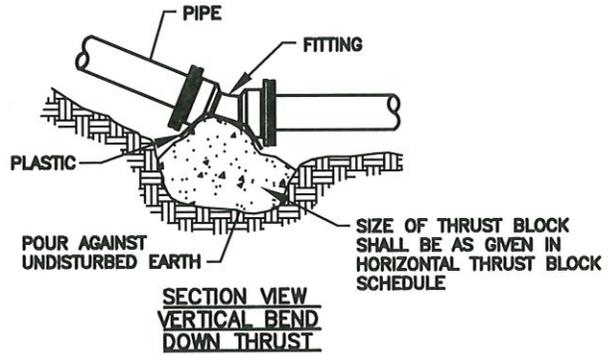
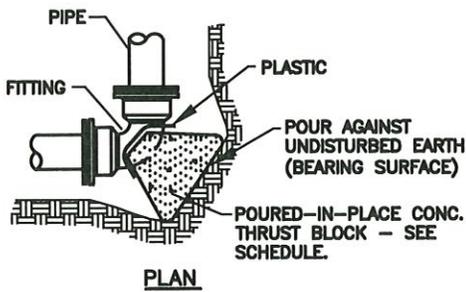
1. RESTRAINED LENGTHS SHOWN ARE MINIMUM AND FOR LINEAL FEET REQUIRED ON EACH SIDE OF FITTING INDICATED.
2. FOOTAGES ARE BASED ON 250 PSI PRESSURE AND 42" COVER. IF PRESSURE IS GREATER OR COVER IS LESS, THE RESTRAINED LENGTH SHALL BE INCREASED. DEVELOPERS ENGINEER TO DESIGN SAME.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
 STANDARD DETAILS  
 THRUST RESTRAINT FOR DUCTILE IRON PIPE  
 FIGURE W6-SHEET 2

#1	November, 2014
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MINIMUM THRUST BLOCK BEARING AREA REQUIRED *				
SIZE	TEES AND DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND
4" OR LESS	2 SF	3 SF	2 SF	1 SF
6"	4 SF	5 SF	3 SF	2 SF
8"	6 SF	8 SF	5 SF	3 SF
10"	10 SF	13 SF	7 SF	4 SF
12"	13 SF	19 SF	10 SF	6 SF
16"	18 SF	25 SF	14 SF	7 SF
18"	23 SF	32 SF	18 SF	9 SF

\* BASED ON A PIPE TEST PRESSURE OF 250 PSI AND BEARING STRENGTH OF SOIL AT 3000 LBS/SQ. FT. FOR OTHER CONDITIONS REVISE AND INCREASE ACCORDINGLY AS APPROVED BY THE ENGINEER.

**NOTES:**

- THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND.
- INCREASE THRUST BLOCK AREA BY 50% IN SAND.
- WRAP ALL FITTINGS WITH 8-MIL POLYETHYLENE ENCASEMENT.
- CONCRETE SHALL NOT COME INTO CONTACT WITH PIPE, VALVES, OR FITTINGS.
- DEAD-END LINES, IF APPROVED, SHALL HAVE A FIRE HYDRANT ASSEMBLY OR A BLOW OFF ASSEMBLY INSTALLED AT THE END OF THE LINE TO FACILITATE FLUSHING.
- ALL THRUST BLOCKS ARE REQUIRED TO BE FORMED ON THE SIDES WITH SUITABLE MATERIAL AND THE BACK AGAINST UNDISTURBED EARTH.
- ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

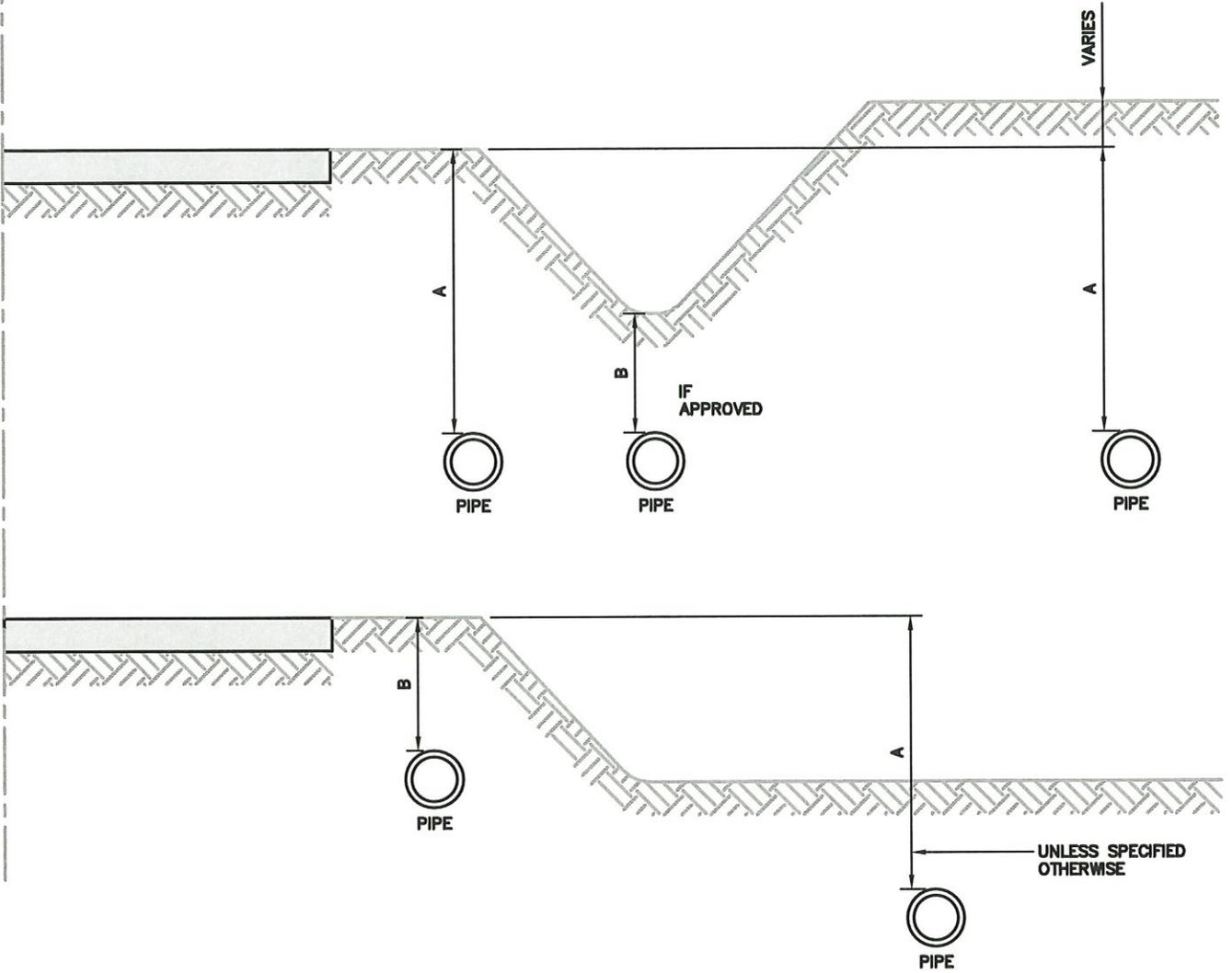
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CITY OF OTHELLO  
STANDARD DETAILS  
THRUST BLOCK DETAIL  
FIGURE W6-SHEET 3

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☉ OF ROADWAY



PIPE SIZE	A	B
6" - 10"	36"	24"
12" - 18"	36"	30"
20" & OVER	42"	36"

**NOTE:**

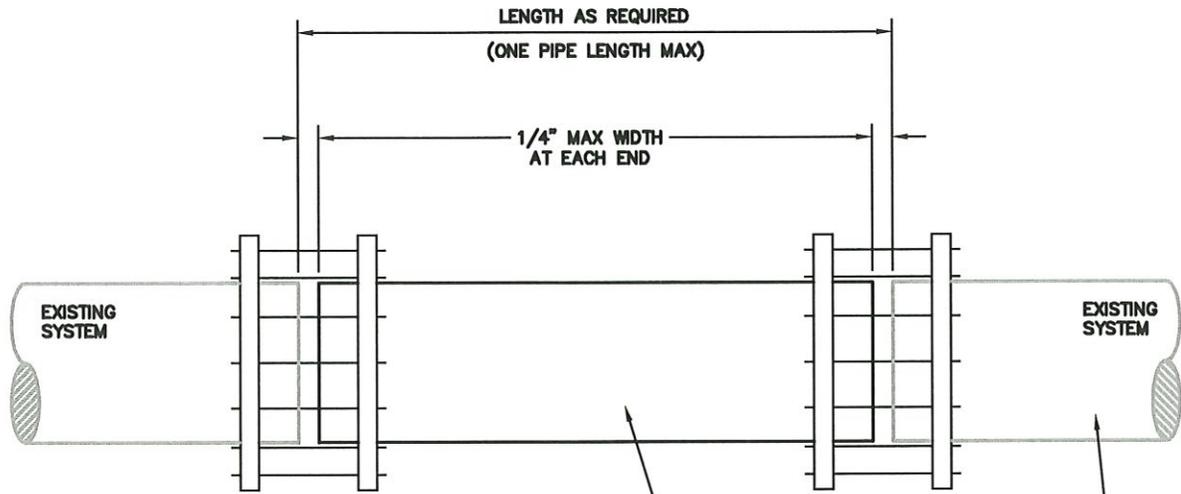
ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
 STANDARD DETAILS  
 WATER MAIN DEPTH REQUIREMENTS (DUCTILE OR PVC PIPE)  
 FIGURE W7-SHEET 1

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DUCTILE IRON WITH EPOXY  
COATING  
SOLID SLEEVE (DISINFECTED)  
TYPE. (LONG PATTERN SLEEVE)

STERILIZED PIPE SPOOL ASSEMBLED  
WITH TEE OR CROSS AS REQUIRED,  
SEE NOTE 2

DISCHARGE PRESSURE PRIOR TO  
REMOVAL OF THRUST BLOCK AND  
CONNECTION TO EXISTING SYSTEM

**NOTES:**

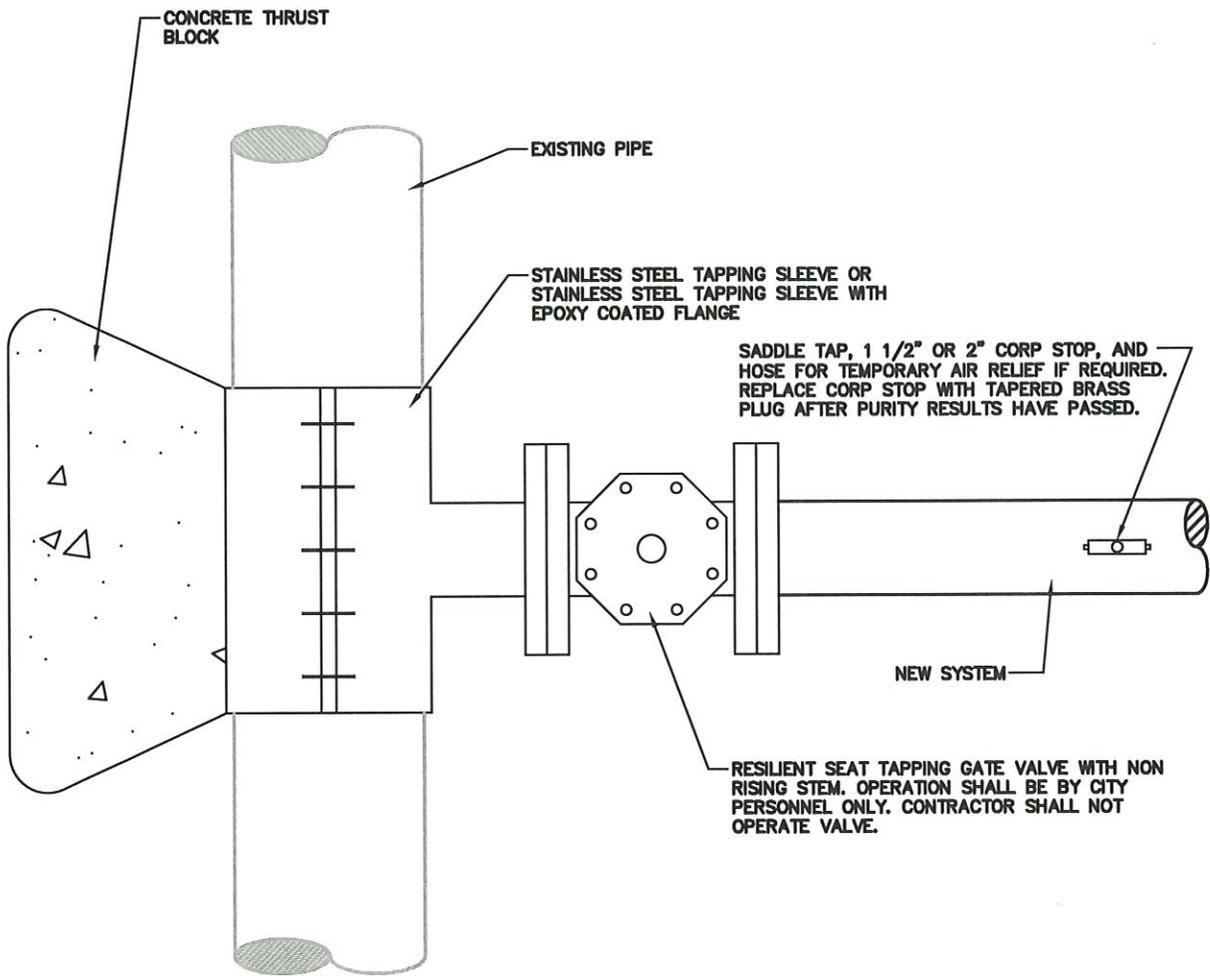
1. NO DEFLECTION SHALL BE ALLOWED AT EITHER COUPLING.
2. ADDITIONAL "IN-LINE" VALVE(S) MAY BE REQUIRED AT THE DIRECTION OF THE CITY.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
CUT IN CONNECTION  
FIGURE W8-SHEET 1

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**NOTE:**  
 ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

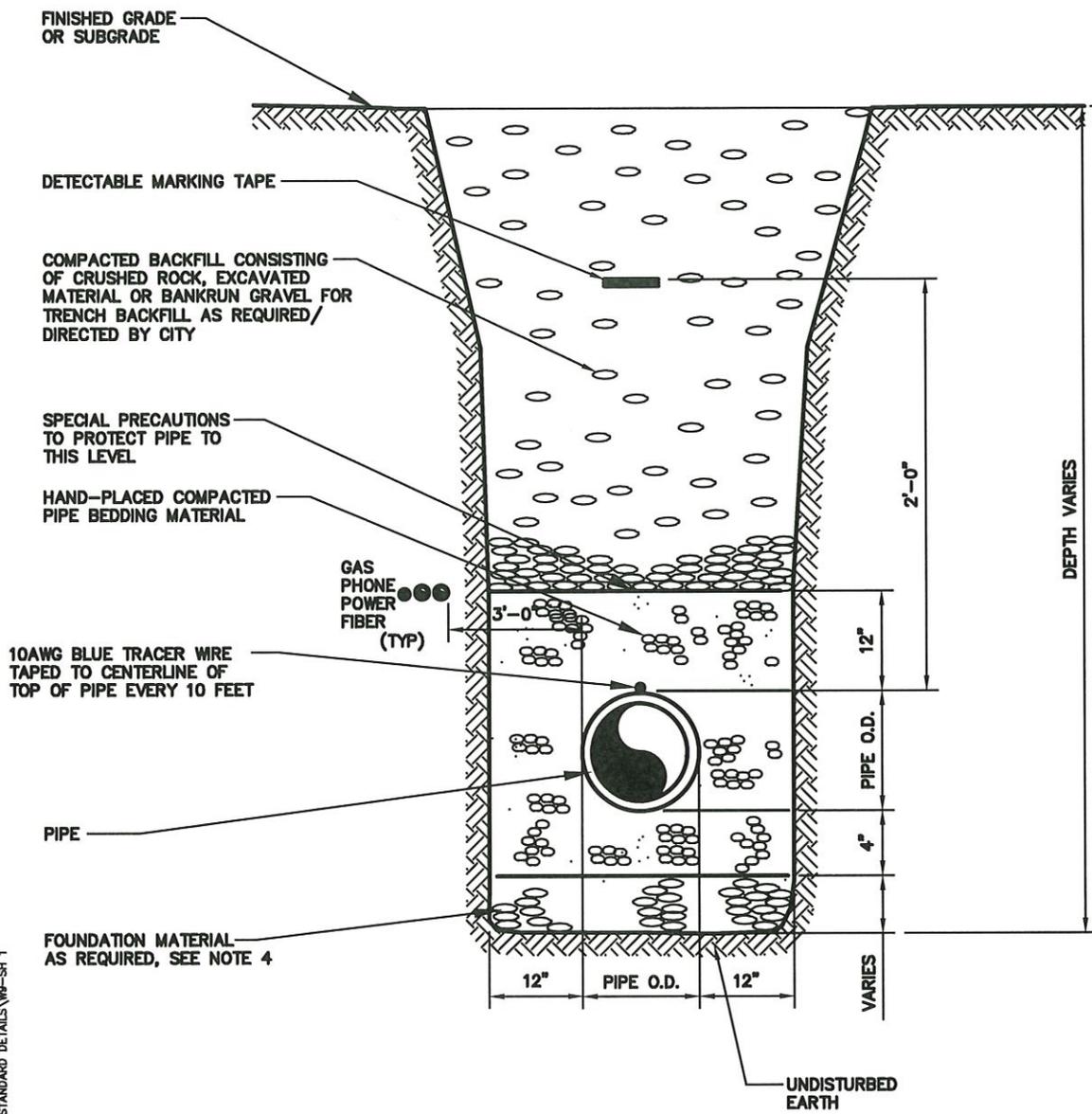
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**CITY OF OTHELLO**  
 STANDARD DETAILS  
 WET TAP CONNECTION  
 FIGURE W8-SHEET 2

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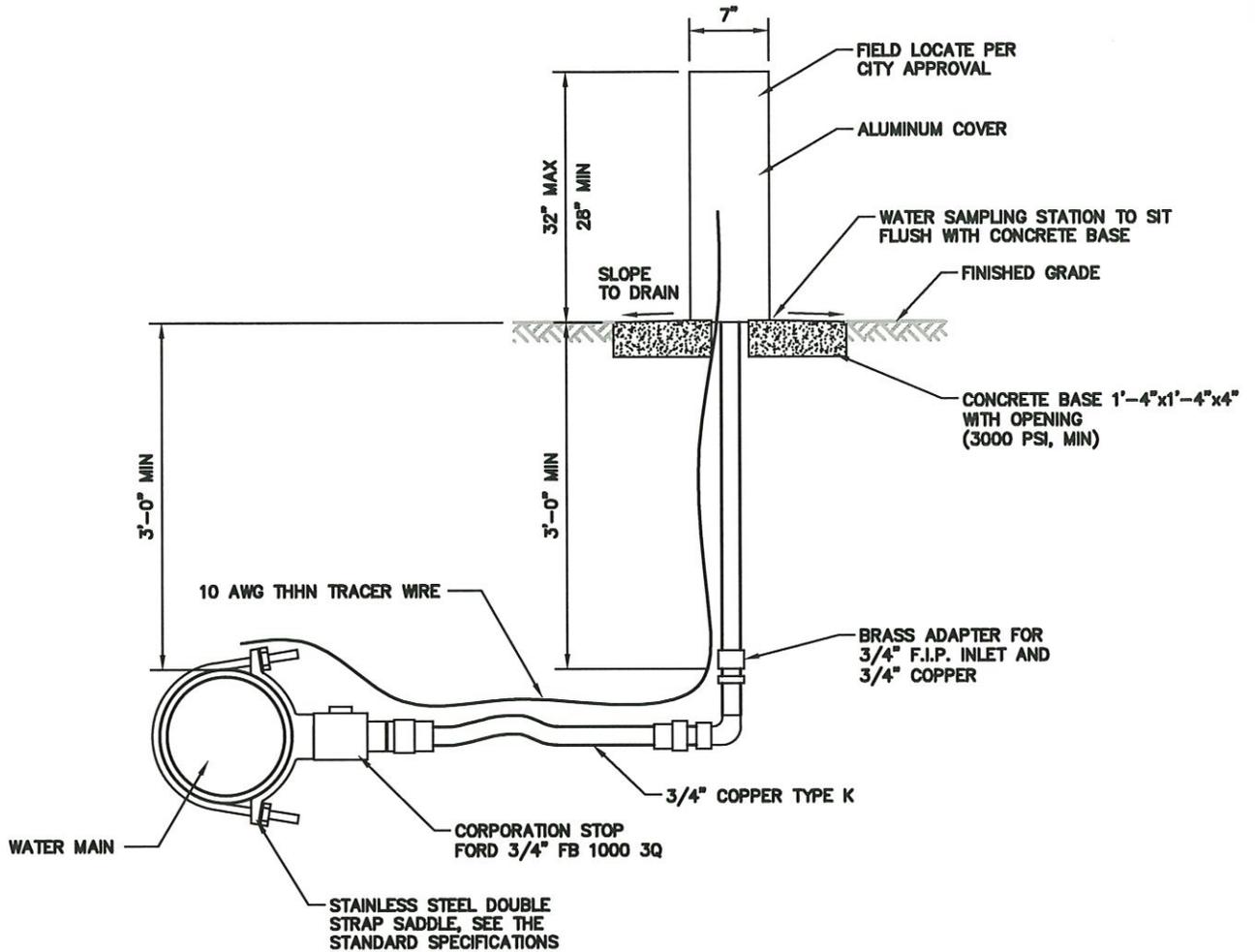
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**NOTES:**

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH THE CITY STANDARDS AND/OR THE STATE OR COUNTY PERMIT REQUIREMENTS (AS MAY BE REQUIRED).
2. ACTUAL SLOPE OF TRENCH SIDES TO BE DETERMINED BY CONTRACTOR TO FIT THE METHOD OF CONSTRUCTION AND ALL SAFETY REQUIREMENTS.
3. NO ADDITIONAL CONDUITS OR PIPES SHALL BE WITHIN 3' OF THE WATER MAIN.
4. EXCAVATE UNSUITABLE MATERIAL DOWN TO UNDISTURBED EARTH AND REPLACE WITH FOUNDATION MATERIAL PER SECTION 9-03.9 (1), "BALLAST", OF THE STANDARD SPECIFICATIONS, AS REQUIRED.
5. TRENCHES MAY BE BEDDED WITH CONTROLLED DENSITY FILL MATERIAL AS APPROVED BY CITY.
6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

<p><b>CITY OF OTHELLO</b> STANDARD DETAILS WATER MAIN TRENCH SECTION FIGURE W9-SHEET 1</p>		#1	November, 2014	
		#2	June, 2016	
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KUPFERLE FOUNDRY CO.  
"ECLIPSE" NO. 88 OR EQUAL

**NOTE:**

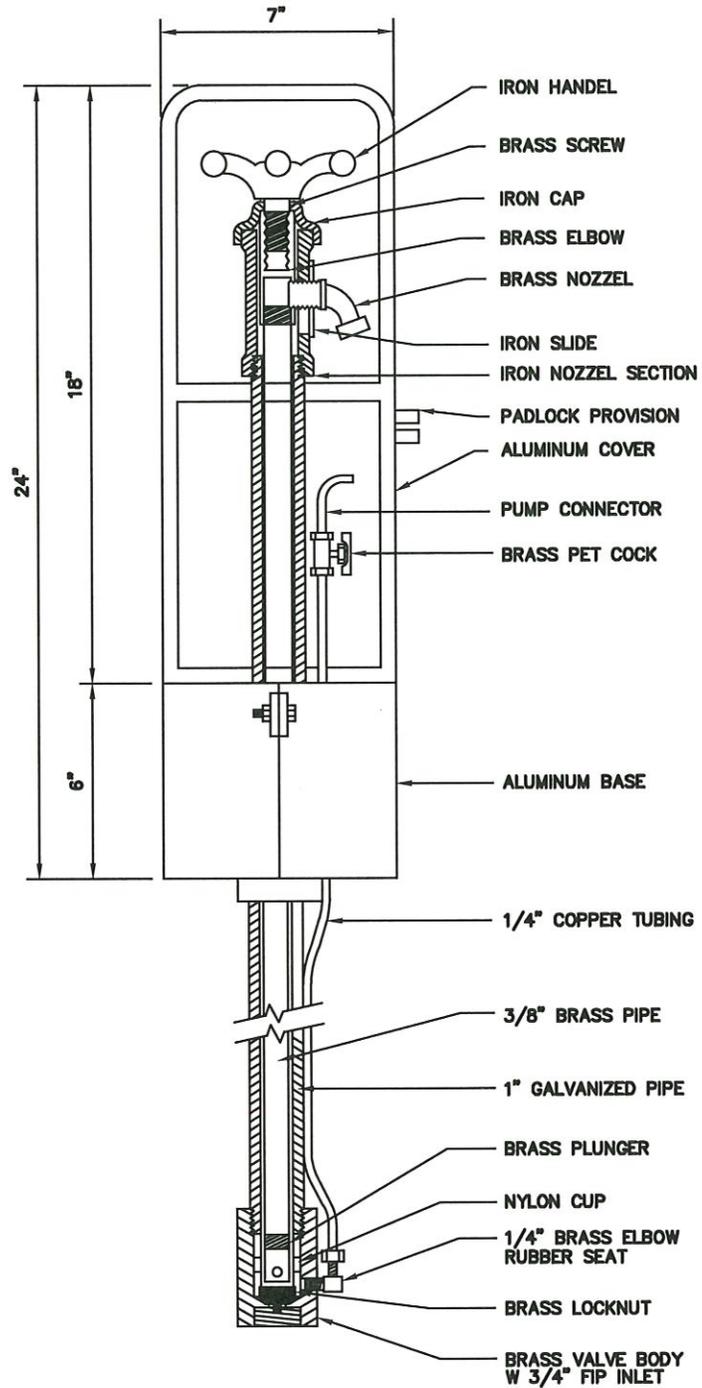
1. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.
2. 10AWG THHN TRACER WIRE IS TO BE THE COLOR "BLUE" FOR WATER MAINS, SERVICES AND WATER SAMPLING STATIONS. ALL WIRE SPLICES ARE TO BE WATER TIGHT DIRECT BURY.

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CITY OF OTHELLO  
STANDARD DETAILS  
WATER SAMPLING STATION  
FIGURE W10-SHEET 1

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KUPFERLE FOUNDRY CO.  
"ECLIPSE" NO. 88 OR EQUAL

**NOTE:**

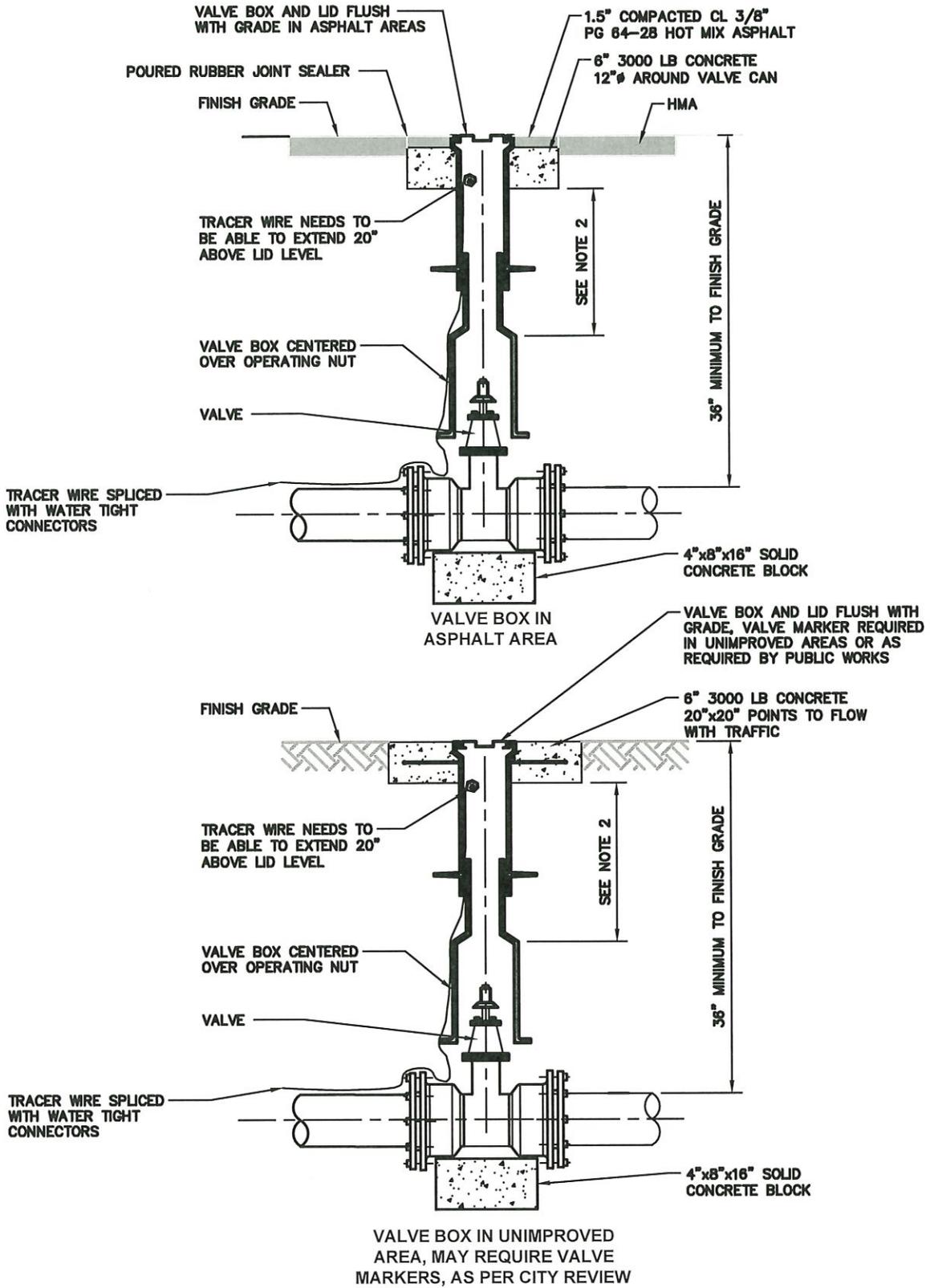
ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
WATER SAMPLING STATION  
FIGURE W10-SHEET 2

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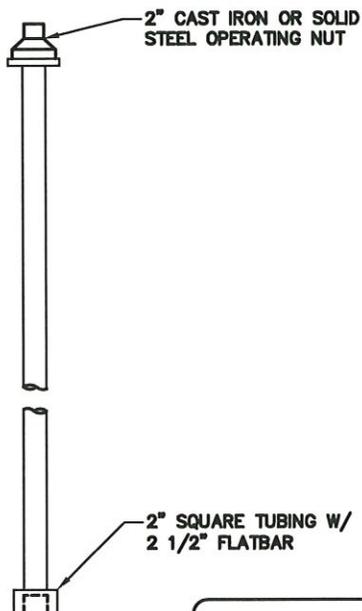
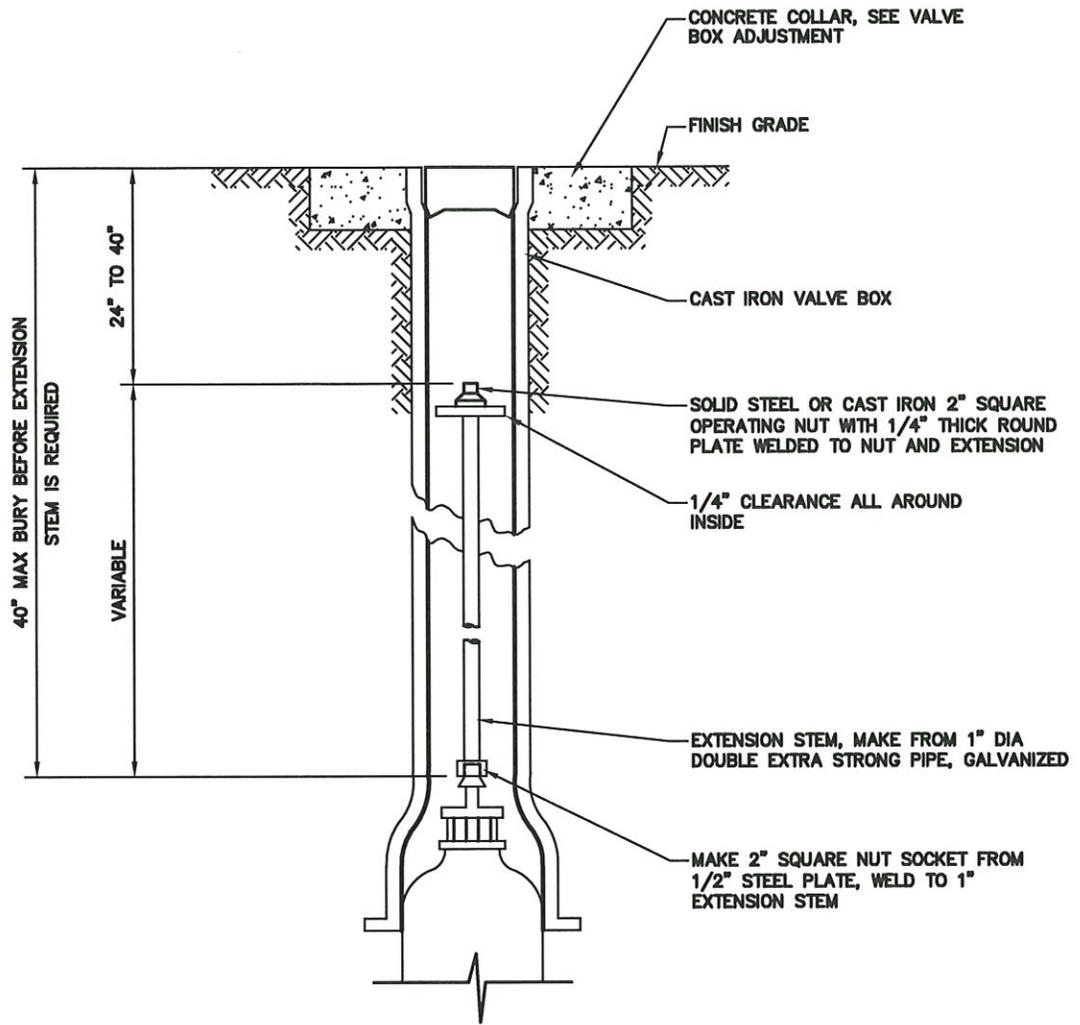
**NOTES:**

1. EACH VALVE SHALL BE PROVIDED WITH ADJUSTABLE CAST IRON VALVE BOX OF 5" INSIDE DIAMETER. VALVE BOXES SHALL HAVE A TOP SECTION WITH A 18" MIN. LENGTH. THE VALVE BOX SHALL BE TYLER #6855 OR CITY APPROVED.
2. 18" MINIMUM, 24" MAXIMUM FOR OPERATOR NUT. EXTENSION MAY BE REQUIRED.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

CITY OF OTHELLO  
STANDARD DETAILS  
VALVE BOX ADJUSTMENT DETAIL  
FIGURE W11-SHEET 1

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**NOTE:**

ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

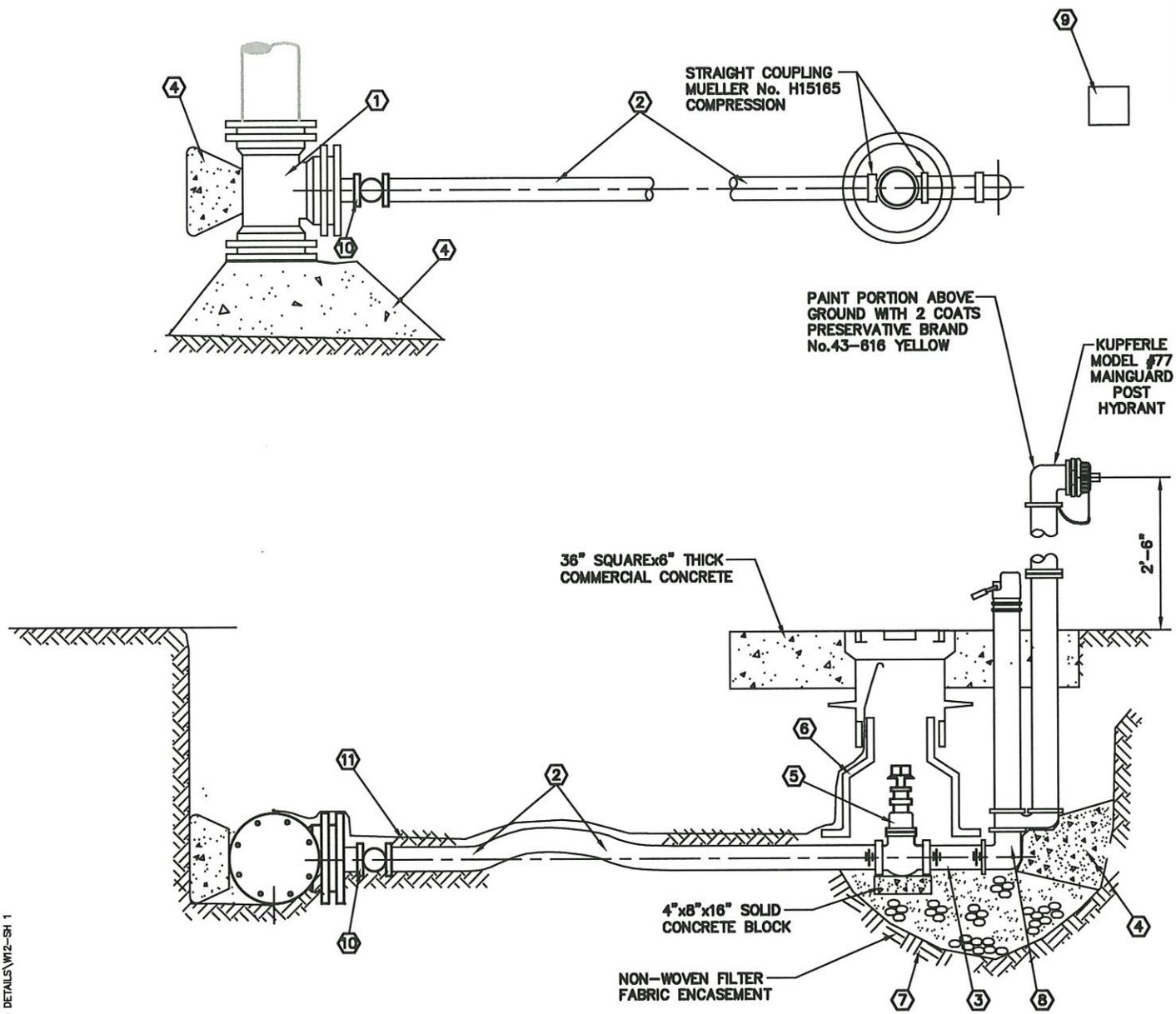
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CITY OF OTHELLO  
STANDARD DETAILS  
WATER VALVE STEM EXTENSION  
FIGURE W11-SHEET 2

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**NOTES:**

1. M<sub>j</sub>xM<sub>j</sub>x6" FL. D.I. TEE WITH REDUCING FLANGE TAPPED 2" AND MJ PLUG
2. 2" TYPE "K" COPPER
3. 2" GALVANIZED IRON PIPE
4. CONCRETE THRUST BLOCK
5. 2" AWWA RESILIENT SEAT GATE VALVE THDxTHD WITH OPERATING NUT
6. CAST IRON VALVE BOX, TYLER #8855
7. 1/4 CUBIC YARD WASHED GRAVEL POCKET
8. 2" BRASS STREET "L"
9. VALVE MARKER POST
10. BALL VALVE, FB 500-7 CORP STOP
11. TRACER WIRE, 10 GA
12. CITY WILL REQUIRE BOLLARDS

**GENERAL NOTES:**

1. TURN NOZZLE TOWARDS ROADSIDE DITCH.
2. INSTALL DIELECTRIC COUPLINGS AT DISSIMILAR METALS.
3. TEMPORARY BLOWOFFS INSTALLED FOR FLUSHING WATERMAIN SHALL BE SIZED TO PROVIDE 2.5fps VELOCITY IN MAIN LINE.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

**CITY OF OTHELLO**  
STANDARD DETAILS  
PERMANENT END-LINE BLOW OFF ASSEMBLY  
FIGURE W12-SHEET 1

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TABLE 8

APPROPRIATE METHODS OF BACKFLOW PROTECTION FOR PREMISES ISOLATION		
DEGREE OF HAZARD	APPLICATION CONDITION	APPROPRIATE APPROVED BACKFLOW PREVENTER
HIGH HEALTH CROSS-CONNECTION	BACKSIPHONAGE OR BACKPRESSURE BACKFLOW	AG, RPBA, OR RPDA
LOW CROSS-CONNECTION HAZARD	BACKSIPHONAGE OR BACKPRESSURE BACKFLOW	AG, RPBA, RPDA, DCVA, OR DCDA

TABLE 9

SEVERE\* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING ISOLATION BY AG OR RPBA

- AGRICULTURAL (FARMS AND DAIRIES)
- BEVERAGE BOTTLING PLANTS
- CAR WASHES
- CHEMICAL PLANTS
- COMMERCIAL LAUNDRIES AND DRY CLEANERS
- PREMISES WHERE BOTH RECLAIMED WATER AND POTABLE WATER ARE PROVIDED
- FILM PROCESSING FACILITIES
- FOOD PROCESSING PLANTS
- HOSPITALS, MEDICAL CENTERS, NURSING HOMES, VETERINARY, MEDICAL AND DENTAL CLINICS, AND BLOOD PLASMA CENTERS
- PREMISES WITH SEPARATE IRRIGATION SYSTEMS USING THE PURVEYOR'S WATER SUPPLY AND WITH CHEMICAL ADDITION+
- LABORATORIES
- METAL PLATING INDUSTRIES
- MORTUARIES
- PETROLEUM PROCESSING OR STORAGE PLANTS
- PIERS AND DOCKS
- RADIOACTIVE MATERIAL PROCESSING PLANTS OR NUCLEAR REACTORS\*
- SURVEY ACCESS DENIED OR RESTRICTED
- WASTEWATER LIFT STATIONS AND PUMPING STATIONS
- WASTEWATER TREATMENT PLANTS\*
- PREMISES WITH AN UNAPPROVED AUXILIARY WATER SUPPLY INTERCONNECTED WITH THE POTABLE WATER SUPPLY

+ FOR EXAMPLE, PARKS, PLAYGROUNDS, GOLF COURSES, CEMETERIES, ESTATES, ETC.

\* RPBA<sub>s</sub> FOR CONNECTIONS SERVING THESE PREMISES ARE ACCEPTABLE ONLY WHEN USED IN COMBINATION WITH AN IN-PLANT APPROVED AIR GAP; OTHERWISE, THE PURVEYOR SHALL REQUIRE AN APPROVED AIR GAP AT THE SERVICE CONNECTION.

GENERAL NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES ARE TO BE INSTALLED IN ACCORDANCE WITH WAC 246-290-490
2. THE FOLLOWING TABLES WERE REPRODUCED FROM THE WAC 246-290-490
3. ALL BACKFLOW PREVENTION ASSEMBLIES TO BE INSTALLED SHALL BE APPROVED FOR INSTALLATION IN WASHINGTON STATE AND BE ON THE LATEST VERSION OF THE USC LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES

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CITY OF OTHELLO  
STANDARD DETAILS  
BACKFLOW PREVENTION  
FIGURE W13-SHEET 1

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# SECTION 7

## 7. SANITARY SEWER STANDARDS

### 7.01 General

The standards established by this Chapter are intended to represent the minimum standards for the design and construction of sanitary sewer facilities. Greater or lesser requirements may be mandated by the City due to localized conditions. Washington State Department of Ecology's Criteria for Sewage Works Design, latest edition, shall also be employed by the City in its review and approval of system connections, extensions, and/or modifications. The following design and construction considerations shall apply: It is the intent of the City of Othello to have all buildings connected to a gravity sewer collection system. Line extensions may be required to provide service to developments instead of septic systems. Longer routes may be required to avoid lift station and pressurized main lines. The City will support right-of-way acquisitions and reimbursements agreements to facilitate the intent.

### 7.02 Design Standards

The design of sanitary sewer systems shall be dependent on local site conditions. The design elements of sanitary sewer systems shall conform to minimum City Standards set forth herein. Department of Ecology approval of sewer extensions may be required. It shall be the responsibility of the Developer's Engineer to obtain Ecology approval, if needed.

- A. If future extensions of the system are deemed probable by the City, the proposed systems shall be extended to "far" property line(s) at the maximum depth available as may be necessary to provide access to future development. At a minimum, access and/or easements to all systems from adjacent areas will be required.
- B. Detailed plans shall be submitted for the City's review which provides the location, size, type and direction of flow of the proposed sewers and the connection with existing sewers. All elevation information shall be to the City datum.
- C. Project plans shall have a horizontal scale 20 feet to the inch and a vertical scale of not more than 5 feet to the inch. Plans and profiles shall show:
  - Locations of streets, rights-of-way, existing utilities and sewers.
  - All associated right-of-way, easement and/or property lines.
  - Site topography at a minimum of 5-foot intervals, to include a minimum of 20-foot within adjacent areas.
  - Vicinity and site location map.
  - Ground surface elevation.
  - Pipe type, class, and size.

- Manhole stationing.
  - Invert and surface elevation at each manhole, and grade of sewer between adjacent manholes. All manholes shall be numbered on the plans and correspondingly numbered on the profile.
  - Where there is any question of the sewer being sufficiently deep to serve any residence, the Developer shall indicate building and basement floor elevations in the profile.
  - All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly water mains, gas mains, storm drains, overhead and underground power lines, telephones lines, and television cables.
  - All utility easements, including County recording numbers.
  - Details in scale drawings which clearly show special sewer joints and cross-sections, and sewer appurtenances such as manholes and related items and all other items as required by the City to clearly identify construction items, materials, and/or methods.
- D. Construction of new sewer systems or extensions of existing systems will be allowed only if the existing receiving system is capable of supporting the added hydraulic load.
- E. Collection and interceptor sewers shall be designed and constructed for the ultimate development of the tributary areas and as established in the City's General Sewer Plan.
- F. Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow. Sewers installed below water table may require special design and inspections.
- G. Computations and other data used for design of the sewer system shall be submitted to the City for approval.
- H. The sewage facilities shall be constructed in conformance with standards herein and current amendments thereto, and other applicable standards as allowed by the City.
- I. Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WPCF, and WSDOT/APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints, impede cleaning operations and future tapping, nor create excessive side fill pressure or ovalation of the pipe, nor seriously impair flow capacity.
- J. All sewers shall be designed to prevent damage from superimposed loads. Proper allowance for loads on the sewer because of the width and depth of trench should be made. When standard-strength sewer pipe is not sufficient, extra-strength pipe

shall be used.

- K. All pipe shall be laid in straight lines and at uniform rate of grade between manholes. Variance from established line and grade shall not be greater than 1/2-inch, provided that such variation does not result in a level or reverse sloping invert; provided, also, that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed 1/64 inch per inch of pipe diameter, or 1/2-inch maximum. Any corrections required in line and grade shall be reviewed with the Public Works Director and shall be made at the expense of the Developer and/or the Contractor.
- L. Deflection tests shall be performed on all PVC sewer mains and the deflection test limit shall be 5.0 percent of the base inside diameter of the pipe.
- M. After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.
- N. The Developer shall be required, upon completion of the work and prior to acceptance by the City, to furnish the City with a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and the Developer shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors and suppliers of material or equipment where such warranties are required, and shall deliver copies to the City upon completion of the work.

### **7.03 General Requirements**

- 1. Prior to construction, the sewer plans shall be reviewed and approved by the Public Works Director (may require DOE or Engineer approval).
- 2. Prior to construction, the Contractor shall notify the City for a pre-construction meeting.
- 3. Work shall be performed only by a Washington State licensed and bonded contractors with a demonstrated experienced in laying public sewer mains of the type being proposed for construction.
- 4. Prior to any work being performed, the Contractor shall contact the Public Works Director to set forth his proposed schedule.
- 5. The Contractor shall obtain approval of materials to be used from the Public Works Director prior to ordering or delivery of materials.

6. Sewer mains shall be laid only in dedicated streets or alleys which have been or will be prior to acceptance exclusively granted to the City.
7. The sewer main shall run in alleys when at all possible or 12 feet southerly or westerly of street centerline. The sewer main shall maintain a minimum 10-foot horizontal separation from proposed or existing water mains.
8. The City may require mains to be oversized to handle future flows consistent with planning documents. Oversizing of mains and extending utilities to the far property lines shall be the responsibility of the developer.
9. Minimum horizontal and vertical separation shall be maintained between water and sewer utilities as required by the DOE manual entitled "Criteria for Sewage Works Design", latest edition. See Appendix A for that section of the DOE Manual pertaining to minimum horizontal and vertical separation.
10. The maximum distance between manholes shall be 400 feet unless specifically approved otherwise by the Public Works Director.
11. PVC pipe shall be a minimum Class S.D.R. 35 and be manufactured in accordance with ASTM D3034.
12. The allowable cover (finished grade) for main line collection piping is 6' to 25'.
13. All pipe shall have a minimum of 72 inches of cover (30 inches in the case of a side sewer on private property). The City reserves the right to require a minimum of three feet of cover unless topography, existing facilities or other future improvements prohibit this minimum cover for installation.
14. The minimum slope for 6-inch side sewer laterals shall be 1.0%. The minimum slope for 8-inch gravity mains shall be 0.5%. The minimum slope for 10" gravity mains shall be 0.4%. The minimum slope for 12 gravity mains shall be 0.3%. The minimum slope shall be maintained unless specifically waived by the Public Works Director in writing.
15. All side sewer laterals shall consist of a gasketed WYE sewer fitting and all necessary pipe and fittings to connect the side sewer lateral to the sewer main. All side sewer laterals shall be of the same material as the main line and shall be provided with a 6" x 6" tee with an approved water-tight cap located within the public right-of-way to be utilized as a clean out. When required by the Public Works Director, a water-tight six-inch capped stub shall be installed which extends vertically from the 6" x 6" tee within 18 inches of finished grade.

16. Each side sewer lateral shall have an approved water-tight cap at the termination of the stub, and it shall be adequately "blocked" to satisfactorily resist the air pressure testing (5 lbs. for 5 minutes).
17. Each side sewer lateral shall have a treated 4" x 4" wood "marker" at the termination of the stub. The "marker" shall extend from the bottom of the trench to 12 inches above finished grade. Above the ground surface, it shall be painted "white" with "S/S" and the depth, in feet, stenciled in black letters 2-inches high.
18. Front lot corners shall be staked prior to construction for side sewer tee location.
19. All side sewers shall be extended a minimum of five feet past the street right-of-way line (or property line).
20. Side sewer connections if allowed directly into manholes shall be constructed to match the sewer main crown (outlet) and the manhole channeled accordingly.
21. Manholes, where sewer extension may occur, shall be provided with knock-outs and channeled accordingly.
22. Manholes shall be provided with a 0.10 foot drop across the channel.
23. If required by the City, locking covers shall be provided for all manholes that are located outside pavement areas and all manhole lids shall have the word "sewer" cast integrally onto its surface.
24. Concrete collars shall be placed around all frames per the Standard Detail for manholes located in gravel drive areas.
25. Pipe connections to manholes shall be as follows: PVC Pipe: Cast or grout a watertight manhole coupling (see Detail) into manhole wall. PVC, optional: Core the manhole and connect sewer pipe with a water-tight flexible rubber boot grouted into manhole wall, Kor-N-Seal boot or equal.
26. Provide the Public Works Director a copy of the survey cut sheets prior to construction.
27. Pipe trenches shall not be backfilled until pipe and bedding installation has been inspected and approved by the Public Works Director.
28. Final air testing shall not be accepted until after the asphalt treated base or finished paving is accomplished, all other underground utilities have been installed, and the lines have been flushed, cleaned, deflection tested and television inspected.

29. Manhole rim and invert elevations shall be field verified after construction by the Developer's engineer(s) and the "as constructed" drawings individually stamped by a Professional Engineer licensed in the State of Washington which shall attest to the fact that the information is correct. As-built drawings shall be to City datum, and must be submitted and approved by the City prior to project acceptance.

#### **7.04 Materials and Testing**

##### **A. Inspection**

The Contractor shall request for inspection a minimum of 48 hours in writing prior to the Contractor's scheduled need. Inspection shall be required for the following items of work:

1. Pipe and bedding installation.
2. Backfill and compaction.

Upon completion of the project all sewer install shall be inspected with television inspection equipment. The Contractor shall provide the City with a copy of the inspection and shall have the City present during the television inspection.

##### **B. Sewer Mains, Laterals and Force Mains**

PVC pipe shall be a minimum Class S.D.R. 35 and be manufactured in accordance with ASTM D3034. The pipe and fittings shall be furnished with bells and spigots which are integral with the pipe wall. Pipe joints shall use flexible elastomeric gaskets conforming to ASTM D3212. Nominal laying lengths shall be 13 feet.

Type of joint shall be mechanical joint or push-on type, employing a single gasket, such as "Tyton", except where otherwise calling for flanged ends. Bolts furnished for mechanical joint pipe and fittings shall be high strength ductile iron, with a minimum tensile strength of 50,000 psi.

Restrained joint pipe, where required shall be push-on joint pipe with "Fast Tight" gaskets as furnished by U.S. Pipe or equal for 12-inch diameter and smaller pipe and "TR FLEX" as furnished by U.S. Pipe or equal for 16-inch and 24-inch diameter pipes. Mechanical joint pipe with retainer glands (grip rings) as manufactured by "Romac" may also be required at the discretion of the City. The restrained joint pipe shall meet all other requirements of the non-restrained pipe.

All pipe shall be jointed by the manufacturer's standard coupling, be all of one manufacturer, be carefully installed in complete compliance with the manufacturer's recommendations.

All fittings shall be short-bodied, ductile iron complying with applicable ANSI/AWWA C110 or C153 Standards for 350 psi pressure rating for mechanical joint fittings and 250 psi pressure rating for flanged fittings. All fittings shall be

cement lined and either mechanical joint or flanged, as indicated on the Plans.

Fittings in areas shown on the Plans for restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG, or ROMAC "Grip Ring", as required and approved by the Public Works Director.

All couplings shall be ductile iron mechanical joint sleeves.

The sewer pipe, unless otherwise approved by the Public Works Director, shall be laid upgrade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug.

All pipe shall be laid in straight lines and at uniform rate of grade between manholes. Variance from established line and grade shall not be greater than 1/2"-inch, provided that such variation does not result in a level of reverse sloping invert; provided, also, that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed 1/64 inch per inch of pipe diameter, or 1/2-inch maximum. Any corrections required in line and grade shall be reviewed with the Public Works Director and shall be made at the expense of the Developer and/ or Contractor.

All extensions, additions and revisions to the sewer system, unless otherwise indicated, shall be made with sewer pipe jointed by means of a flexible gasket which shall be fabricated and installed in accordance with the manufacturer's specifications.

All joints shall be made up in strict compliance with the manufacturer's recommendations and all sewer pipe manufacture and handling shall meet or exceed the ASTM and CPAW recommended specifications, current revisions.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed, cleaned, re-lubricated if required, and replaced before the rejoining is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instructions provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to assure that joints once home are

held so, until fill material under and alongside the pipe has been sufficiently compacted. At the end of the work day, the last pipe laid shall be blocked in an effective way to prevent creep during "down time."

For the joining of dissimilar pipes, suitable adapter couplings shall be used which have been approved by the Public Works Director.

All gravity sewer pipe shall be bedded with pea gravel or other material approved by the Public Works Director. The PVC pipe shall be bedded from a depth of four inches below the pipe to eight inches above the pipe. Ductile iron gravity sewer pipe shall be bedded from a depth of four inches below the pipe to the spring line of the pipe. The bedding material shall extend across the full width of the trench and shall be compacted under the haunches of the pipe.

Special concrete bedding shall consist of a pipe cradle constructed of Portland cement concrete containing not less than five sacks of cement per cubic yard. Sand, gravel and water proportions are subject to approval by the Engineer. Maximum aggregate size shall be 1-1/2 inches. Maximum slump shall be four inches. The bottom of the trench shall be fully compacted before the placement of pipe cradle. The Contractor shall protect pipe against flotation and disturbing the horizontal alignment of the pipe during the pouring of the concrete. (Washington State Department of Transportation Standard Specifications for "Class A" concrete bedding will be acceptable.)

Clay or Bentonite dams shall be installed across the trench and to the full depth of the granular material in all areas of steep slopes, stream crossings and wetland to prevent migration of water along the pipeline.

All backfill shall be placed and compacted in accordance with City, County, or State requirements as may be applicable and copies of the compaction results shall be provided to the Public Works Director.

### **C. Manholes**

Manholes shall be of the offset type and shall be pre-cast concrete sections with either a cast in place base, or a pre-cast base made from a 3,000-psi structural concrete. Joints between pre-cast wall sections shall be confined O-ring or as otherwise specified. For connections to existing systems, a concrete coring machine, suitable for this type of work, shall be utilized in making the connection. The existing manhole shall be re-channeled as required. The new pipe connection shall be plugged (water tight) until the new pipe system has been installed and approved. The Contractor shall be responsible for any existing defects in the existing manhole unless these defects are witnessed by a representative of the City prior to any work being performed to make the connection. The Contractor shall be required to remove any and all deleterious material in the existing manhole and downstream reaches as a result of his/her work.

**1. Manhole Sections**

Manhole sections shall be placed and aligned so as to provide vertical sides and vertical alignment of the ladder steps. The completed manhole shall be rigid, true to dimension, and be water tight. Rough, uneven surfaces will not be permitted. The mortar used between the joints in the pre-cast sections and for laying manhole adjusting bricks shall be composed of one part cement to two parts of plaster sand. All joints shall be thoroughly wetted and completely filled with mortar, smoothed both inside and outside to insure water tightness. The outside and inside of pre-cast concrete manhole sections shall be plastered and troweled smooth with 1/2-inch (minimum) of mortar in order to attain a watertight surface.

**2. Manhole Steps**

Manhole steps shall be polypropylene, Lane International Corp. No. P13938 or equal. Ladders (maximum 3-foot length) shall be P-14938-SQ polypropylene Lane International Corp. or equal, and shall be compatible with steps.

**3. Grade Adjustment**

Where work is located in public rights-of-way, a maximum of 16 inches shall be provided between the top of the cone or slab and the top of the manhole frame.

**4. Channels**

Channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well-rounded junctions, satisfactory to the Public Works Director. Allowances shall be made for a one-tenth foot drop in elevation across the manhole in the direction of flow. Channel sides shall be carried up vertically from the invert to three-quarters of the diameter of the various pipes. The concrete shelf shall be warped evenly and sloped 3/8-inch per foot to drain. Rough, uneven surfaces will not be permitted. Channels shall be constructed to allow the installation and use of a mechanical plug or flow meter of the appropriate size.

**5. Drop Manholes**

Drop manholes shall, in all respects, be constructed as a standard manhole with the exception of the drop connection as further detailed herein.

**6. Lift Holes and Steel Loops**

All lift holes shall be completely filled with expanding mortar, smoothed both inside and outside, to insure water tightness. All steel loops shall be removed, flush with the manhole wall. The stubs shall be covered with mortar and smoothed. Rough, uneven surfaces will not be permitted.

**7. Frames and Covers**

Frames and covers shall be ductile iron. Castings shall be free of porosity, shrink cavities, cold shuts or cracks, or any surface defects which would impair serviceability. Repair of defects by welding, or by the use of "smooth-on" or similar material, will not be permitted. Frames and covers shall be machine finished or ground on seating surfaces so as to assure non-rocking fit in any position and interchangeability of covers. Rings and covers shall be adjusted to conform to the final finished surface grade of the street or easement to the satisfaction of the Public Works Director. Manhole frames and covers shall be as manufactured by D&L Foundry, Model No. A-2000, or approved equal. All manhole covers shall have the words "Sewer" and "City of Othello" cast integrally onto its surface.

**D. Side Sewer Lateral**

A side sewer lateral is considered to be that portion of a sewer line that will be constructed between a main sewer line and a property line or easement limit line. All applicable specifications given herein for sewer construction shall be held to apply to side sewer laterals. Side sewers shall be for a single connection only and be a minimum four-inch diameter pipe. Side sewers shall be connected to the tee, provided in the sewer main where such is available, utilizing approved fittings or adapters. The side sewer shall rise at a maximum of 45° and a minimum slope of two percent, from the sewer main to provide each lot with the deepest sewer possible.

The Contractor shall provide for each side sewer service a 4-inch x 4-inch treated wooden post which extends from the invert of the end of the 6-inch pipe to above the existing ground. The exposed area of this post shall be painted white and shall have selected thereon in two inch letters (black paint) "S/S" and shall also indicate the depth of the sewer service stub from finished grade.

Where no tee or wye is provided or available, connection of 4-inch and 6-inch side sewer shall be made by machine-made tap and saddle, only with specific written authorization of the Public Works Director. The Public Works Director shall review the exact location and material list in its evaluation. Saddles shall be placed between 45° and 80° off vertical. The maximum bend permissible at any one fitting shall not exceed 45°.

The maximum bend of any combination of two adjacent fittings shall not exceed 45° (one-eighth bend) unless straight pipe of not less than three feet in length is installed between such adjacent fittings.

## **E. Private Side Sewers**

Private side sewers are the extension of side sewer laterals located outside of the public rights-of-way or easements granted to the City of Othello.

1. Side sewer pipe located on private property shall be 4-inch minimum, ductile iron or PVC ASTM 3034.
2. Pipe shall be bedded with pea gravel or clean, free drawing sand.
3. Private yard sewers shall be installed per the Uniform Plumbing Code.
4. City requires inspections by Public Works Director on all sewer saddles to sewer mains.
5. Parallel water and sewer lines shall be 10 feet apart horizontally wherever possible and have a vertical separation of 18 inches if a vertical crossing is necessary. Less separation requires a 10-foot sleeve on the water line or bedding the pipe in CDF material.
6. Provide "grease trap" or grease interceptor of a size and type approved by the City at all such locations as may be deemed necessary by the City.

## **E. Testing Gravity Sewers for Acceptance**

The Contractor and/or Developer shall furnish all facilities and personnel for conducting tests under the observation of the Public Works Director.

### **1. Preparation for Testing for Leakage**

The Contractor and/or Developer shall be required, prior to testing, to clean and flush all gravity sewer lines by jetting with clean water. The completed gravity sewer, after completion of backfill and cleaning, shall have a televised inspection. This will be required prior to paving. The sewer shall then be tested by the low-pressure air test method only after all utilities are installed, prior to paving.

### **2. Low Pressure Air Test**

The sewer pipe shall be tested for leaks using air in the following manner: Immediately following the pipe cleaning and televised inspection, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 5.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least five minutes shall be allowed for temperature stabilization before proceeding further.

The result of any pressure drop will be unacceptable by the City and will require the Contractor to repair at their own expense.

The pipeline shall be considered acceptable, when tested at an average pressure of 3.0 pounds per square inch greater than the pipe section's

adjacent groundwater back pressure if the total rate of air loss from any section tested in its entirety between manholes, cleanouts or pipe ends does not exceed the table found in the Standards.

The Developer and/or Contractor shall furnish all equipment, materials, and labor necessary for making test. The equipment shall be to the approval of the Public Works Director. The manner and time of testing shall be subject to approval by the Public Works Director. It shall be the Developer's and/or Contractor's responsibility to determine the level of the water table at each manhole.

### **3. Deflection Test**

Deflection tests shall be performed on all PVC gravity sewer mains by pulling a mandrel through the pipe and the deflection test limit shall be 5.0 percent of the base inside diameter or for example 7.28 inches for 8-inch diameter pipe. The sewer lines shall be thoroughly cleaned prior to the deflection test.

### **7.05 Video Taping**

Upon completion, the sewer lines shall be internally televised by a qualified firm providing said services. A 3/4-inch ball shall be attached to the front of the camera so that it is visible during all camera inspections. A 1/2-inch VHS tape or CD that must be able to run on City equipment together with a written log of the television inspection shall be submitted to the City for their review and approval, and if accepted, be retained in their files. This work shall be performed prior to paving unless otherwise approved by the Public Works Director. The Public Works Director shall be notified of the date of TV inspection to insure his availability and on-site witnessing of the event during this time.

### **7.06 Crossings**

All state highway, railroad, and stream crossings shall be encased with a steel casing or ductile iron or PVC sleeve, as approved by the City and prevailing regulatory agencies. The welded steel casing or sleeve shall be of sufficient diameter, size and strength to enclose the sewer pipe and to withstand maximum highway or railroad loading. Sizing and wall thickness of casing is subject to approval by the Public Works Director. Sand backfill or grout fill between the casing and the sewer pipe shall be required. In order to prevent the sand from being washed from the casing the ends of the casing shall be bricked and cemented or capped after installation, backfill and testing of the pipe are completed.

## **7.07 Staking**

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor directing or performing such work shall be currently licensed by the State of Washington to perform said tasks. A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction. The minimum staking of sanitary sewer systems shall be as follows:

- A. Stake centerline alignment at a minimum of 50 foot intervals unless otherwise approved by the City.
- B. Stake location of all manholes and side sewer laterals for grade and alignment.
- C. Provide a copy of survey "cut sheets" to the City.
- D. Stake finished manhole rim elevation and invert elevations of all pipes in manholes.

## **7.08 Trench Excavation**

- A. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.
- B. Trenches shall be excavated to the line and depth designated by the City to provide a City approved minimum of cover over the pipe. See Details as applicable. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency and in compliance with all safety requirements of the prevailing agencies. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The Contractor shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.
- C. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth 6-inches below sewer line grade. Where materials are removed from below pipe grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.
- D. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City, and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.
- E. The bedding course shall be constructed to grade with hand tools in such a manner

that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

## 7.09 Bedding

Gravel backfill for pipe bedding shall be installed in conformance with the Specifications herein.

### 1. Bedding for Sewer Main Pipe and Side Laterals

#### A. PVC Pipe (All Sizes)

Pipe bedding material to be installed and compacted under, around and above all pipe as specified in this Section shall be clean, well-graded sand or sand/gravel mixture with a maximum particle size of 5/8 inch, entirely free of clay, silt, organic or deleterious matter and frozen material. Minimum material weight shall be 110 pounds per cubic foot at 95% relative compaction. Bedding shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing*</u>
3/4" Square	100
3/8" Square	95-100
U.S. No. 8	0-10
U.S. No. 200	0-3
Sand Equivalent	35 MIN.

\*All percentages are by weight. Native Material may not be used for bedding.

#### B. Side Sewer Laterals

All requirements of 7.09 (1) herein apply, except that bedding material shall be clean sand, free of gravel, with no more than 5% passing the No. 200 Sieve (by weight).

## 7.10 Backfilling

Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected backfill material shall be placed and compacted around and under the sewer pipe by hand tools. Special precautions shall be provided to protect the pipe to a point 12 inches above the crown of the pipe. The remaining backfill shall be compacted to 95 percent of the maximum density in traveled areas and road "prisms", and 95 percent outside driveway, roadways, road prism, shoulders, parking or other traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. Typically, all utility trenches located in roadway sections, roadway "prisms", or beneath traffic bearing areas shall be backfilled with crushed surfacing top course. Due to localized conditions, the City may allow/permit the backfill of the trench section with suitable excavated material, as determined by the City, or if suitable native material is not available from trenching

operations, the City may order the placing and compaction of bank run gravel conforming to Section 9-03.19 of the WSDOT Standard Specifications for backfilling the trench. All excess material shall be loaded and hauled to waste.

### **7.11 Street Patching and Restoration**

See Chapter 5 for requirements regarding street patching.

### **7.12 Erosion and Dust Control**

The detrimental effects of erosion and sedimentation shall be minimized by conforming with the following general principles:

- A. Soil shall be exposed for the shortest possible time.
- B. Reducing the velocity and controlling the flow of runoff.
- C. Detaining runoff on the site to trap sediment.
- D. Releasing runoff safely to downstream areas.

In applying these principles, the Developer and/or Contractor shall provide for erosion and dust control by conducting work in workable units; minimizing the disturbance to cover crop materials; providing mulch and/or temporary cover crops, sprinkling sedimentation basins, and/or diversions in critical areas during construction; controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible.

#### **1. Trench Mulching**

Where there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, backfill material shall be compacted and held in place by covering the disturbed area with straw and held with a covering of jute matting or wire mesh anchored in place.

#### **2. Cover-Crop Seeding**

A cover crop shall be sown in all areas excavated or disturbed during construction that were not paved, landscaped and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original or superior condition. Cover-crop seeding shall follow backfilling operations. The Developer and/or Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be re-seeded if required and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection. During winter months, the Contractor may postpone seeding, if conditions are such that the seed will not germinate and grow. The Developer and/or Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown

and affords protection from erosion. The cover crop shall be sown at a rate of 10 to 15 pounds of seed per acre using a hand or power operated mechanical seeder capable of providing a uniform distribution of seed.

### **7.13 Adjustment of New and Existing Utility Structures to Grade**

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

#### **1. Asphalt Concrete Paving Projects**

On asphalt concrete paving projects, the manholes shall not be adjusted until the pavement is completed, at which time the center of each manhole lid shall be relocated from references previously established by the Developer and/or Contractor. The pavement shall be cut as further described and base material removed to permit removal of the cover. The manhole shall then be brought to proper grade.

Prior to commencing adjustment, a plywood and Visqueen cover as approved by the Public Works Director shall be placed over the manhole base and channel to protect them from debris.

The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter of which shall not exceed 48 inches or 14 inches from the outside diameter of the ductile iron frame, whichever is smaller. The ductile iron frame shall be brought up to desired grade, which shall conform to surrounding road surface.

Adjustment to desired grade shall be made with the use of concrete lift rings. No cast or ductile iron adjustment rings will be allowed. An approved class or mortar (one part cement to two parts of plaster sand) shall be placed between manhole sections; adjustment rings or bricks and ductile iron frame to completely fill all voids and to provide a watertight seal. No rough or uneven surfaces will be permitted inside or out. Adjustment rings shall be placed and aligned so as to provide vertical sides and vertical alignment of manhole steps and ladder.

Check manhole specifications for minimum and maximum manhole adjustment and step requirements. Special care shall be exercised in all operations in order not to damage the manhole, frames and lids or other existing facilities.

As soon as the street is paved past each manhole, the asphalt concrete mat shall be scored around the location of the manhole, catch basin, meter boxes or valve box. After rolling has been completed and the mat has cooled, it shall be cut along the scored lines. The manholes, catch basins, meter boxes and valve boxes shall then be raised to finished pavement grade and the

annular spaces filled with cement concrete to within 1-1/2 inches of the finished grade. The remaining 1-1/2 inches shall be filled with Commercial Hot Mix Asphalt to give a smooth finished appearance. See detail in Project Plans.

After pavement is in place, all joints shall be sealed with hot asphalt cement (AR 4000W). A sand blanket shall be applied to the surface of the AR 4000W hot asphalt cement binder to help alleviate "tracking".

Asphalt concrete patching shall not be carried out during wet ground conditions or when the ambient air temperature is below 50°F. Asphalt concrete mix shall be at required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining two inches shall then be filled with Commercial Hot Mix Asphalt and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density and uniformity of grade. The joint between the patch and the existing pavement shall then be carefully painted with hot asphalt cement or asphalt emulsion and shall be immediately covered with dry paving sand before asphalt cement solidifies. All debris such as asphalt pavement, cement bags, etc., shall be removed and disposed of by the Developer and/or his Contractor.

Prior to acceptance of a project, manholes shall be cleaned of all debris and foreign material. All manhole steps and ladders shall be cleaned free of grout. Any damage occurring to the existing facilities due to the Developer's and/or Contractor's operations shall be repaired at his/her own expense.

2. Adjustment of Manholes in Easements

Manholes in easement areas shall be adjusted to insure drainage away from the manhole frame and cover. The manhole frame and cover shall be set approximately 0.1 foot above finished grade. Concrete collars shall be set about the structure, as detailed herein, in all non-paved areas.

3. Adjustment of Valve Box Castings

Adjustment of valve box castings shall be made in the same manner as for manholes.

## 7.14 Finishing and Cleanup

Before acceptance of sewer system construction, all pipes, manholes, catch basins, and other appurtenances shall be cleaned of all debris and foreign material. After all other work on this project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections of a new roadway consistent with the original section, and as hereinafter specified.

On sewer construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that upon completion the area will present a uniform appearance, blending into the contour of the adjacent properties. All other requirements outlined previously shall be met.

Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished to the required cross section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by handwork to meet requirements outlined herein, to the satisfaction of the Public Works Director.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade. Where the existing surface is below sidewalk and curb, the area shall be filled and dressed out to the walk. Wherever fill material is required in the planting area, the finished grade shall be elevated to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks in excess of six inches in diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform, natural, well-sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer and/or Contractor shall remove and dispose of same and restore said disturbed areas at his own expense.

Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris which is the result of the Developer and/or Contractor's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the Public Works Director.

Castings for manholes, valves, lamp holes, vaults and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the City.

#### **7.15 Cleaning and Testing**

Prior to the completion of work, the constructed sanitary sewer system shall be cleaned and tested in accordance with Section 7-17.3(2) of the Standard Specifications.

All lines shall be flushed clean of all debris by jetting with clean water prior to acceptance. The debris shall be intercepted and collected at the nearest downstream point of access. The material shall then be waste-hauled to an approved dump site.

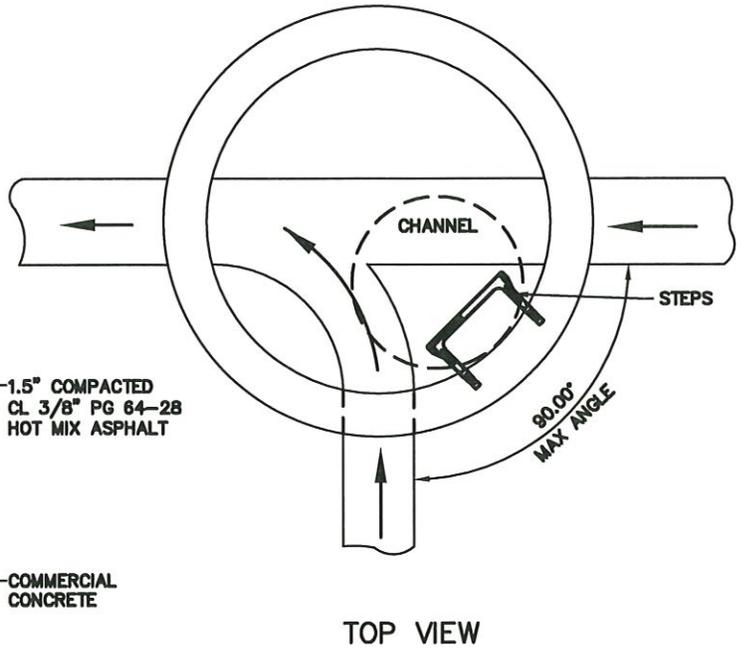
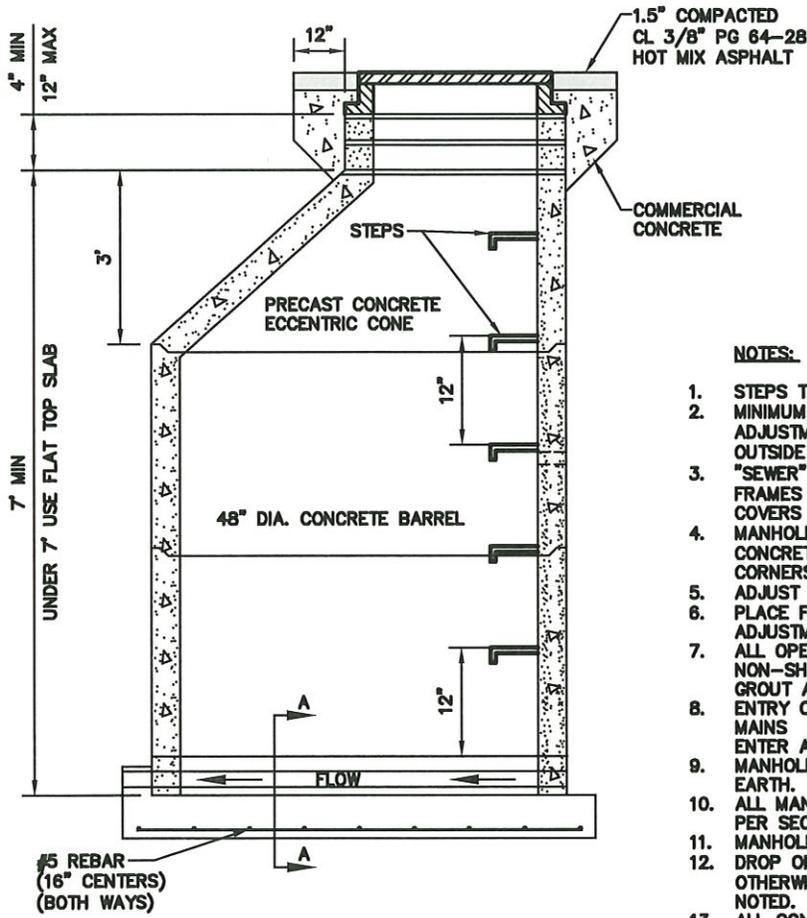
Water for flushing shall be made available and obtained from the City. However, the City reserves the right to operate all hydrants at times and locations convenient to their schedule and available personnel.

#### **7.16 General Guarantee and Warranty**

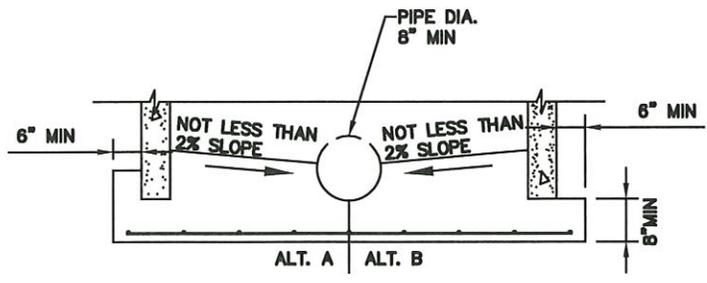
The Developer shall be required, upon completion of the work, and prior to acceptance by the City, to furnish the City a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing, poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors and suppliers of material or equipment where such warranties are required, and shall deliver copies to the City upon completion of the work.

Easement documents, if applicable, shall be filed and recorded with the Adams County Auditor's office and the documents reviewed by the City's Engineer and/or Attorney prior to project acceptance.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SE-STANDARD DETAILS\SE1-SH 1



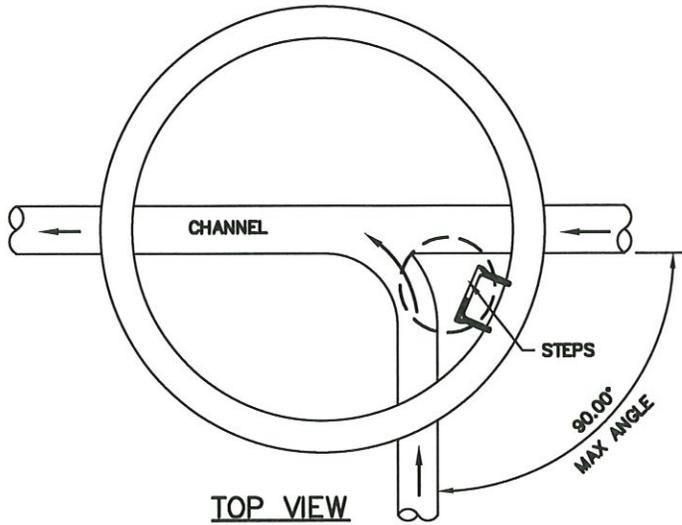
- NOTES:**
1. STEPS TO BE LEFT OR RIGHT OF THE MAIN INFLOW LINE.
  2. MINIMUM OF 1 4" ADJUSTMENT RING WITH A MAXIMUM OF 12" OF ADJUSTMENT. PLASTER INSIDE AND OUTSIDE FACE WITH 1/2" THICK NON-SHRINK GROUT.
  3. "SEWER" AND "CITY OF OTHELLO" SHALL BE CAST IN ALL LIDS. FRAMES SHALL BE MODEL A-2000-R1 BY D&L FOUNDRY AND COVERS SHALL BE MODEL A-2000-25 BY D&L FOUNDRY.
  4. MANHOLES NOT IN ASPHALT SHALL BE CENTERED IN A 6'x6'x6" CONCRETE PAD AT FINISH GRADE. SLOPE CORNERS DOWN IN GRAVEL STREETS.
  5. ADJUST MANHOLE LIDS IN ASPHALT TO 1/4" BELOW FINISH GRADE.
  6. PLACE FLEXIBLE GASKET BETWEEN BARREL SECTIONS, CONE, AND ADJUSTMENT RINGS.
  7. ALL OPEN JOINTS AND PICK HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND FINISHED TO A SMOOTH SURFACE.
  8. ENTRY COUPLINGS OR SAND COLLARS REQUIRED WHERE SEWER MAINS ENTER AND EXIT THE MANHOLE.
  9. MANHOLE BASE SHALL BE ON UNDISTURBED OR COMPACTED EARTH.
  10. ALL MANHOLES, STEPS, RING AND COVER, AND GASKETS SHALL BE PER SECTION 7.
  11. MANHOLE SHALL BE SET PLUMB.
  12. DROP OF GRADE THROUGH MANHOLE SHALL BE 0.10' UNLESS OTHERWISE NOTED.
  13. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.



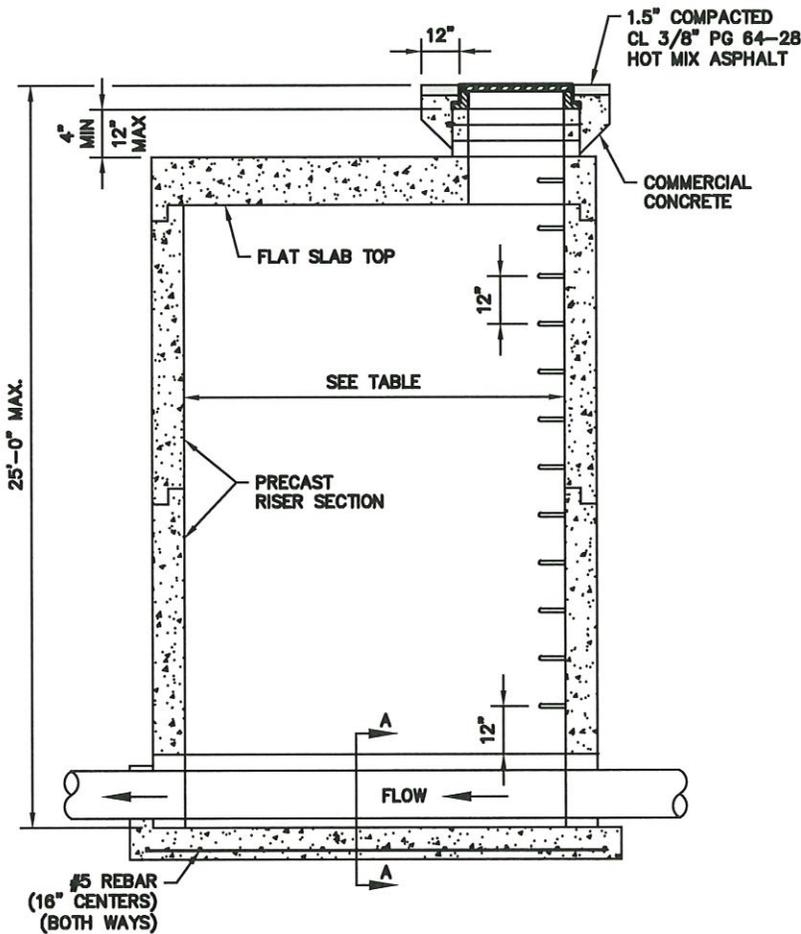
**BASE CONSTRUCTION ALTERNATIVES**  
 ALT. A: BASE & INVERT IN SINGLE POUR  
 ALT. B: POUR BASE, SET MANHOLE, THEN POUR INVERT  
 ALT. C: PRECAST CONCRETE BASE & INVERTS

SECTION A-A

<b>CITY OF OTHELLO</b> STANDARD DETAILS SEWER MANHOLE FIGURE SE1-SHEET 1		#1 November, 2014	
		#2 June, 2016	
	REVISION #      DATE		



MANHOLE DIMENSION TABLE				
DIA.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MIN. DISTANCE BETWEEN KNOCKOUTS
48"	4"	8"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

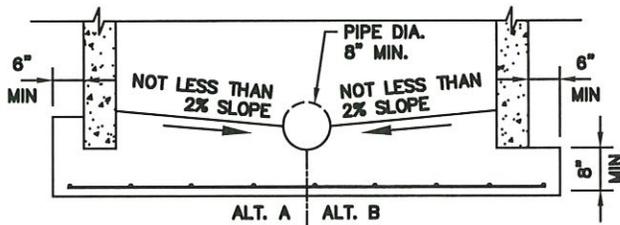


**NOTES:**

1. STEPS TO BE LEFT OR RIGHT OF THE MAIN INFLOW LINE.
2. MINIMUM OF (1) 4" ADJUSTMENT RING WITH A MAXIMUM OF 12" OF ADJUSTMENT. PLASTER INSIDE AND OUTSIDE FACE WITH 1/2" THICK NON-SHRINK GROUT.
3. "SEWER" AND "CITY OF OTHELLO" SHALL BE CAST IN ALL LIDS. FRAMES SHALL BE MODEL A-2000-R1 BY D&L FOUNDRY AND COVERS SHALL BE MODEL A-2000-25 BY D&L FOUNDRY.
4. MANHOLES NOT IN ASPHALT SHALL BE CENTERED IN A 6'x8'x8" CONCRETE PAD AT FINISH GRADE. SLOPE CORNERS DOWN IN GRAVEL STREETS.
5. ADJUST MANHOLE LIDS IN ASPHALT TO 1/4" BELOW FINISH GRADE.
6. PLACE FLEXIBLE GASKET BETWEEN BARREL SECTIONS, CONE, AND ADJUSTMENT RINGS.
7. ALL OPEN JOINTS AND PICK HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND FINISHED TO A SMOOTH SURFACE.
8. ENTRY COUPLINGS OR SAND COLLARS REQUIRED WHERE SEWER MAINS ENTER AND EXIT THE MANHOLE.
9. MANHOLE BASE SHALL BE ON UNDISTURBED OR COMPACTED EARTH.
10. ALL MANHOLES, STEPS, RING AND COVER, AND GASKETS SHALL BE PER SECTION 7.
11. MANHOLE SHALL BE SET PLUMB.
12. DROP OF GRADE THROUGH MANHOLE SHALL BE 0.10' UNLESS OTHERWISE NOTED.
13. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

**BASE CONSTRUCTION ALTERNATIVES**

- ALT. A: BASE & INVERT IN SINGLE POUR  
 ALT. B: POUR BASE, SET MANHOLE, THEN POUR INVERT  
 ALT. C: PRECAST CONCRETE BASE & INVERTS

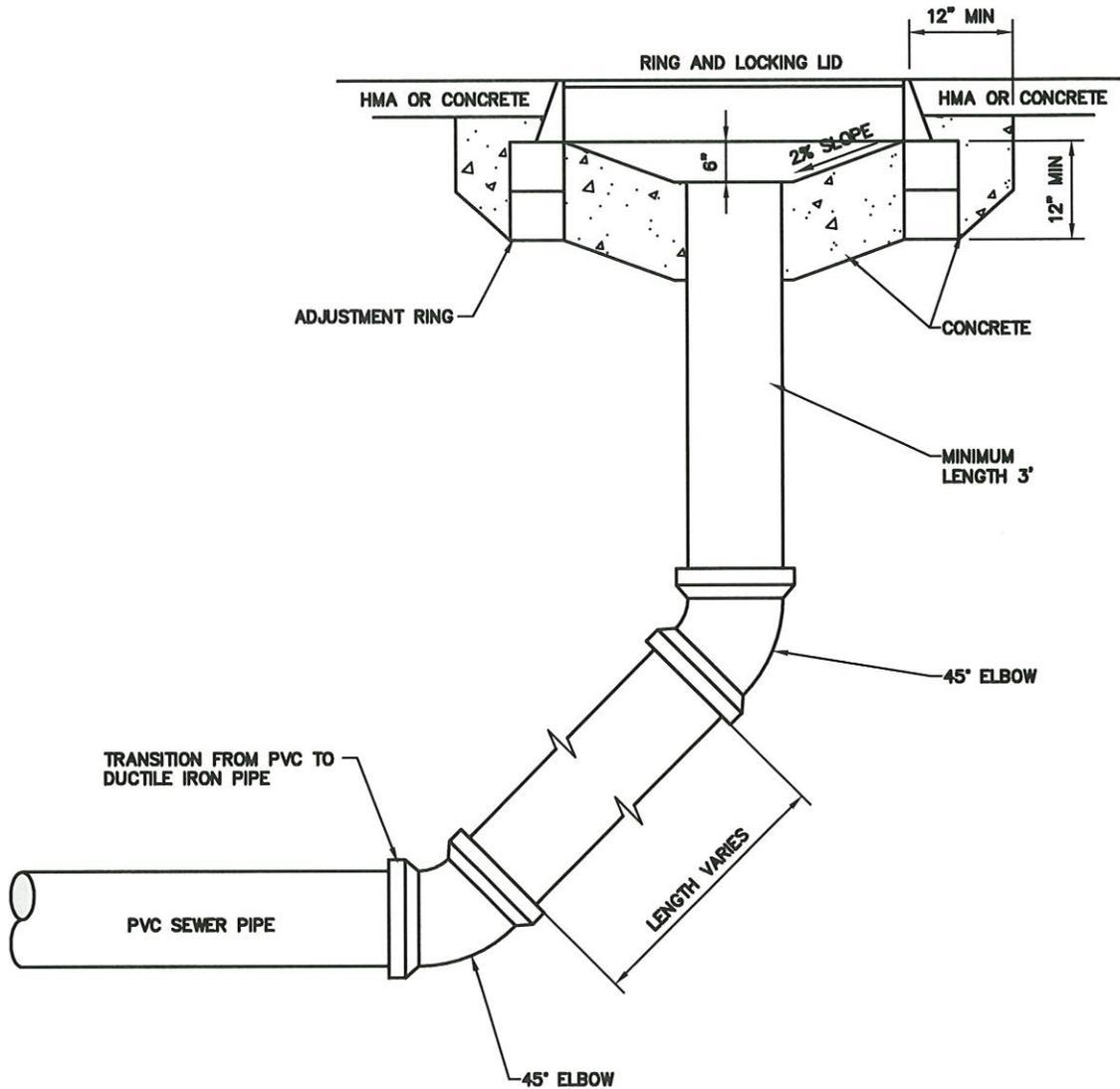


**SECTION A-A**

CITY OF OTHELLO  
 STANDARD DETAILS  
 SEWER MANHOLE TYPE 2  
 FIGURE SE1-SHEET 2

#1	February, 2018
REVISION #	DATE





CLEANOUTS TO BE USED ONLY WHEN APPROVED BY PUBLIC WORKS

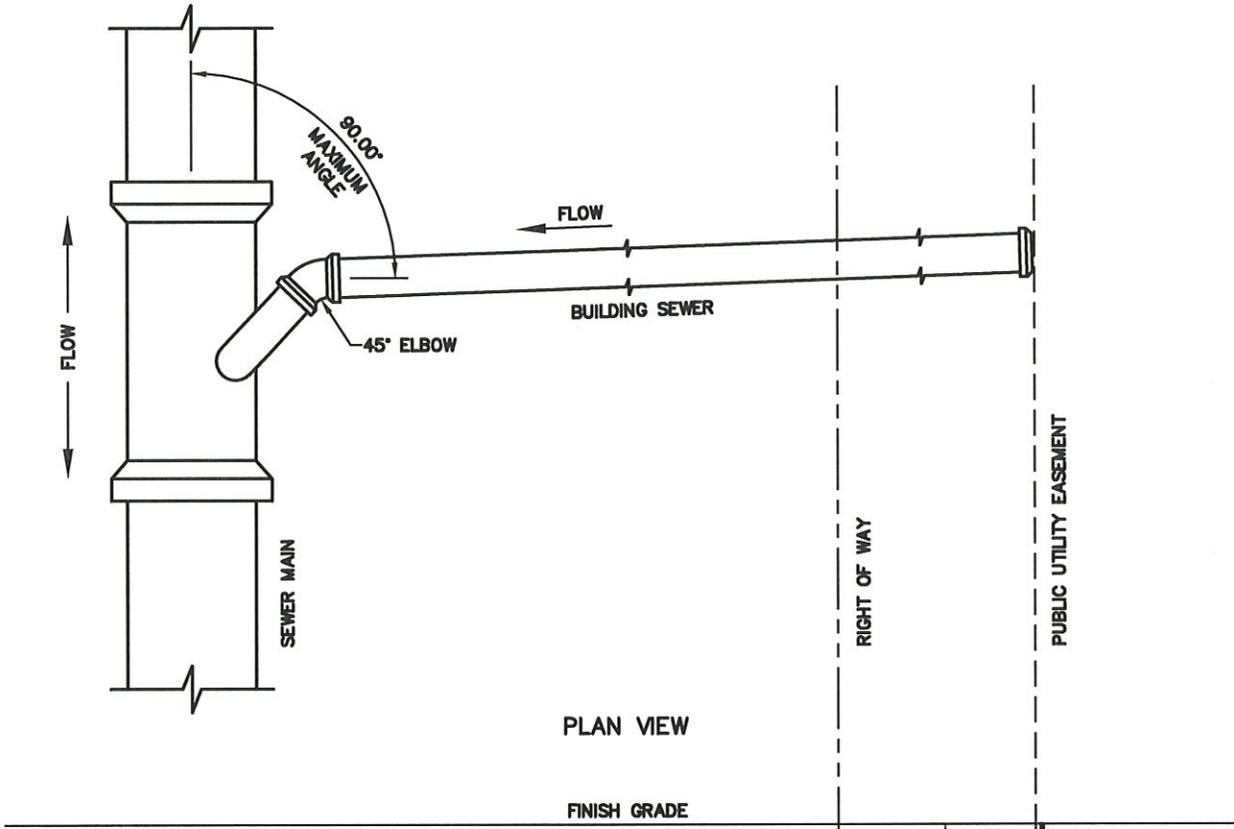
**NOTES:**

1. CLEANOUTS NOT IN ASPHALT SHALL BE CENTERED IN A 3'x3'x6" CONCRETE PAD AT FINISH GRADE. SLOPE CORNERS DOWN IN GRAVEL STREETS.
2. ADJUST CLEANOUT LIDS IN ASPHALT TP 1/4" BELOW FINISH GRADE.
3. "SEWER" SHALL BE CAST IN ALL CLEANOUT LIDS.
4. RING/LID ASSEMBLY SHALL SET ON 2 6" CONCRETE ADJUSTMENT RINGS.
5. ALL CLEANOUT PIPING AND ELBOWS SHALL BE A MINIMUM OF CLASS 50 DUCTILE IRON.
6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

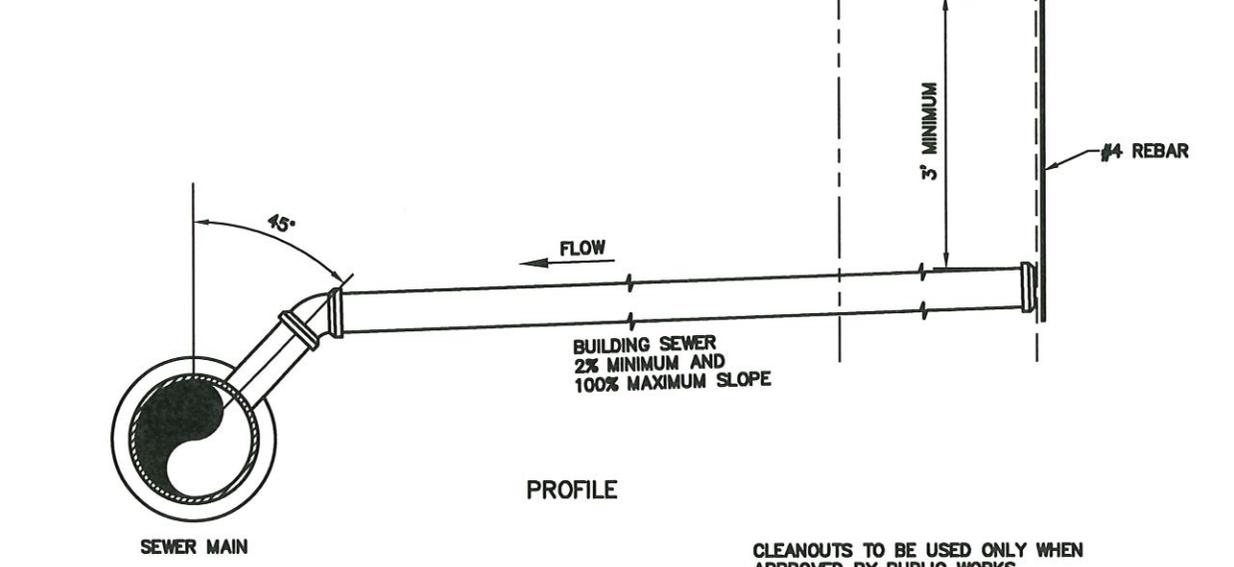
CITY OF OTHELLO  
 STANDARD DETAILS  
 SEWER CLEANOUT  
 FIGURE SE2-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





PLAN VIEW



PROFILE

CLEANOUTS TO BE USED ONLY WHEN APPROVED BY PUBLIC WORKS

**NOTES:**

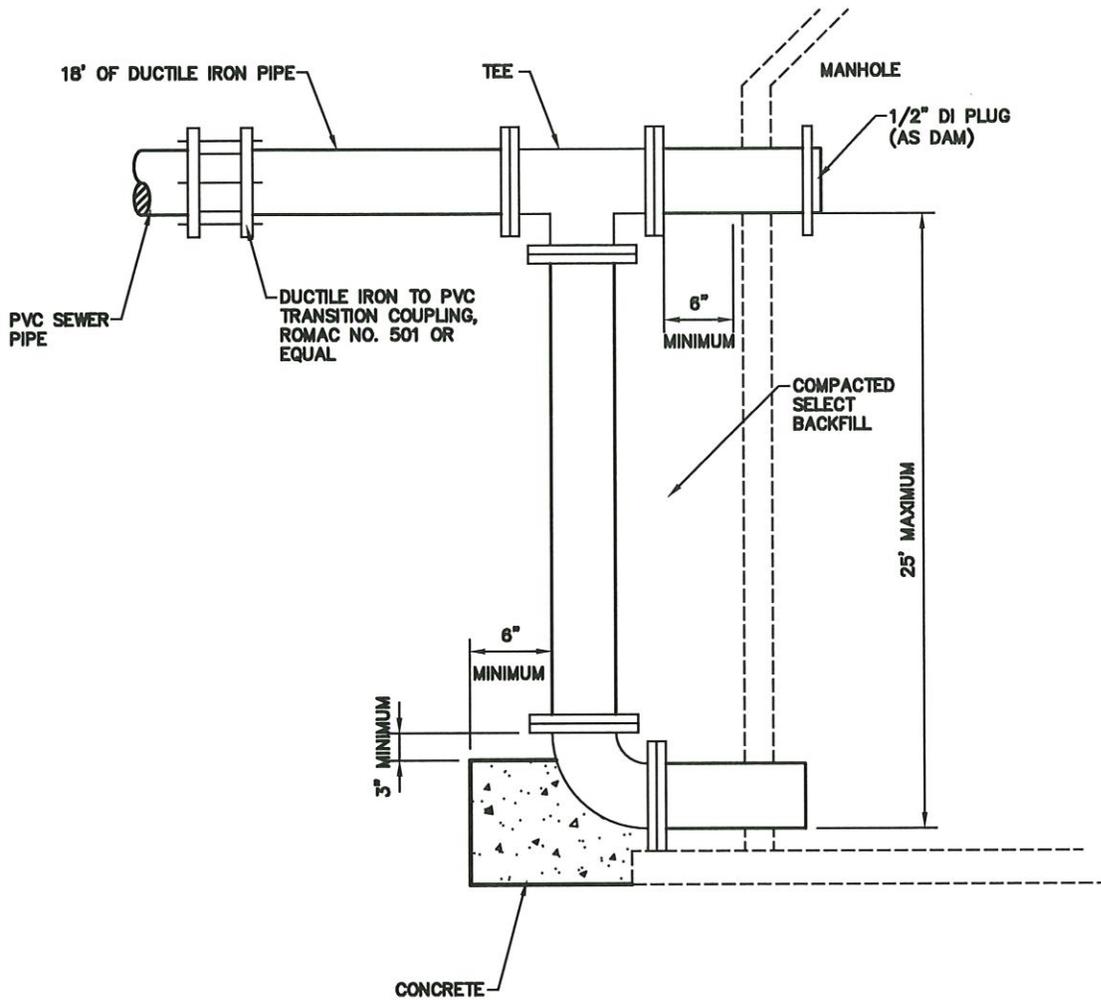
1. IN-LINE GASKETED WYE SEWER FITTING SHALL BE USED ON NEWLY INSTALLED MAINS. GASKETED WYE SEWER SADDLE WITH STAINLESS STEEL CLAMPS SHALL BE USED ON EXISTING SEWER MAINS.
2. THE END OF THE SERVICE LINE SHALL BE CAPPED.
3. A RED CAP SHALL BE PLACED ON THE #4 REBAR MARKING THE END OF THE SERVICE LINE. THE RED CAP WILL BE SUPPLIED BY THE CITY.
4. BUILDING SEWER CLEANOUTS ARE NOT ALLOWED WITHIN MUNICIPAL EASEMENTS OR RIGHT OF WAY.
5. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\72 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SE-STANDARD DETAILS\SE3-SH 1

**CITY OF OTHELLO**  
 STANDARD DETAILS  
 SIDE SEWER  
 FIGURE SE3-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





**DUCTILE IRON  
OUTSIDE DROP CONNECTION**

**NOTES:**

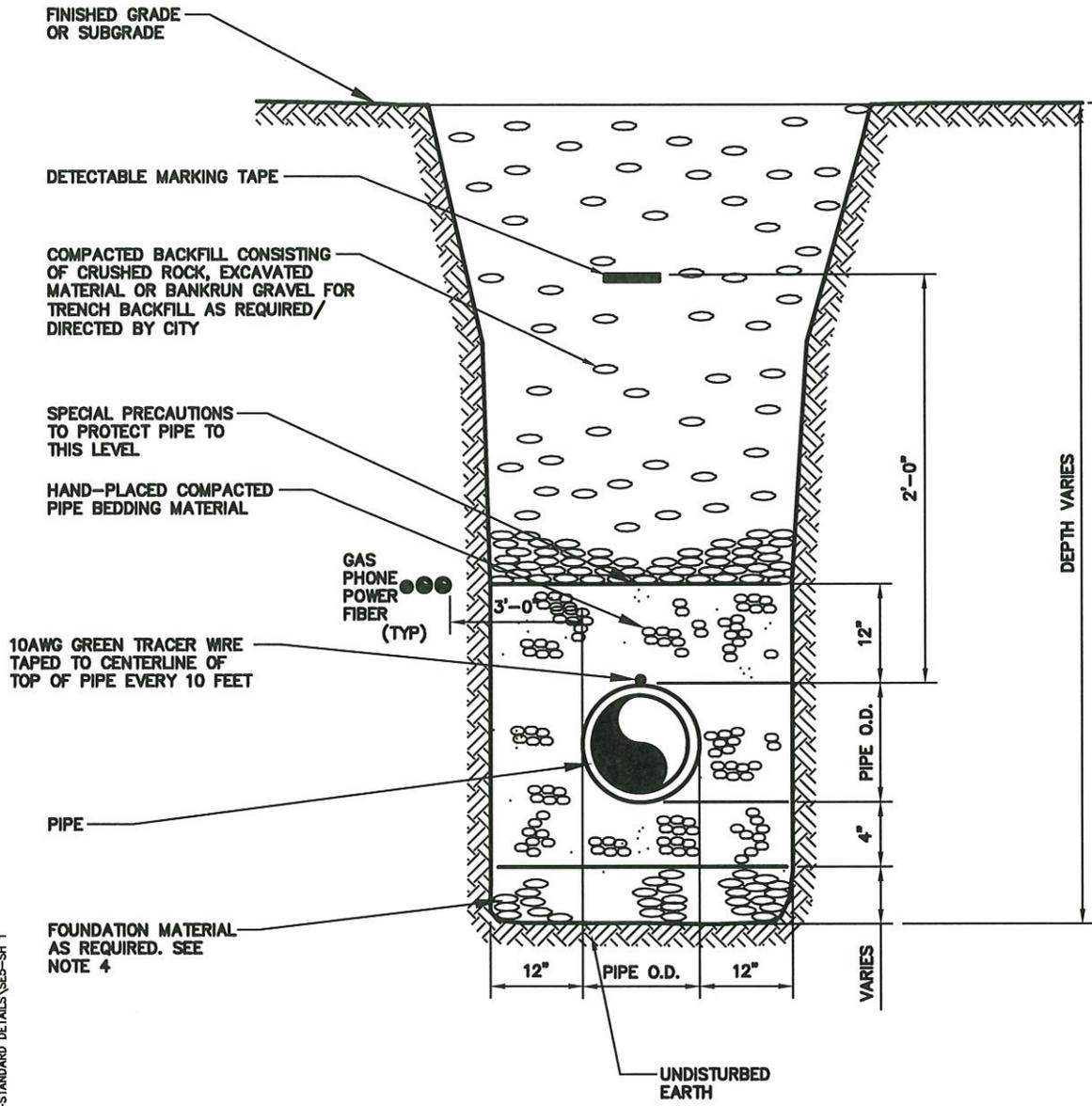
1. ALL PIPING AND FITTINGS TO BE DUCTILE IRON AND BE WRAPPED IN 8-MIL POLYETHYLENE ENCASEMENT.
2. MANHOLE SHALL BE CONSTRUCTED PER FIGURE SE1-SHEET 1.
3. ALL DUCTILE IRON PIPE SHALL BE A MINIMUM OF CLASS 50.
4. DROP MANHOLE CONNECTIONS SHALL NOT BE CONSTRUCTED UNLESS APPROVED BY PUBLIC WORKS.
5. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

CITY OF OTHELLO  
STANDARD DETAILS  
DROP MANHOLE CONNECTION  
FIGURE SE4-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SE-STANDARD DETAILS\SE4-SH 1



**NOTES:**

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH THE CITY STANDARDS AND/OR THE STATE OR COUNTY PERMIT REQUIREMENTS (AS MAY BE REQUIRED).
2. ACTUAL SLOPE OF TRENCH SIDES TO BE DETERMINED BY CONTRACTOR TO FIT THE METHOD OF CONSTRUCTION AND ALL SAFETY REQUIREMENTS.
3. NO ADDITIONAL CONDUITS OR PIPES SHALL BE WITHIN 3' OF THE SEWER MAIN.
4. EXCAVATE UNSUITABLE MATERIAL DOWN TO UNDISTURBED EARTH AND REPLACE WITH FOUNDATION MATERIAL PER SECTION 9-03.9(1), "BALLAST", OF THE STANDARD SPECIFICATIONS, AS REQUIRED.
5. TRENCHES MAY BE BEDDED WITH CONTROLLED DENSITY FILL MATERIAL AS APPROVED BY CITY.
6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SE-STANDARD DETAILS\SE5-SH 1

**CITY OF OTHELLO**  
STANDARD DETAILS  
SANITARY SEWER MAIN TRENCH DETAILS  
FIGURE SE5-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



# SECTION 8

## **8. STORM WATER STANDARDS**

### **8.01 General**

Storm drainage revisions, additions, modification, or changes shall be made in compliance with City standards, ordinances, and Best Management Practices as identified in the 2005 Washington State Department of Ecology Stormwater Management Manual for the Eastern Washington. Adequate provisions shall be made for storm drainage, storm sewers, and associated appurtenances sufficient to transmit maximum seasonal flows and one hundred year floodwaters characterized by the area. All storm drains and facilities shall be designed by a professional engineer licensed in the State of Washington.

Storm sewer systems shall be designed and constructed in accordance with all applicable portions of Section 7 (Sanitary Sewer Standards) of these Design Standards.

If warranted based on the condition and capacity of the existing storm drainage infrastructure (or lack thereof), and impacts caused by the proposed development, off-site improvements may be required, at the Public Works Director's discretion, to mitigate impacts caused by the proposed development.

Any project that collects 5,000 square feet or more of effective impervious surface in a threshold discharge area shall provide flow control (detention or retention) for stormwater runoff.

In addition, the City has developed standards with respect to the applicable uses of storm drainage facilities and how they are constructed. These policies are intended to create storm drainage facilities that are safe, effective, functional, accessible, maintainable, and aesthetically pleasing.

Stormwater facilities shall not be located where, in the city's opinion, the facility will create an attractive nuisance or be considered as unattractive from any public street, park, or venue.

When preparing the stormwater site plan and construction drawings, the Developer's Engineer shall make appropriate accommodation for conveyance and bypass of upstream off-site runoff and discharge onto adjacent downstream properties. This will include provisions for easements to accommodate upstream properties and/or constructing a tight line system across downstream properties (in an appropriate easement) where a suitable natural or previously constructed tight line system does not exist.

No storm drain pipe shall be buried deeper than 20 feet except that installation to a depth greater than 20 feet can be approved to avoid the need for a pump system.

Unless otherwise approved by the City, pipes shall not be located underneath sidewalks, driveways, walls, or landscaped areas except for where drain pipes cross perpendicular to these areas.

Unless otherwise approved by the City, pump systems will not be allowed for conveying storm runoff to a detention or treatment system.

Where frontage improvements are required by the City, the Developer shall include in the detention calculations, the right-of-way improvements and provide detention and treatment for those improvements.

Where allowed, underground vaults or tanks shall not be located underneath public roads or recreation facilities.

Underground vaults or tanks shall not protrude above the ground surface more than 4-feet in any location. All portions protruding above the ground surface shall have an architectural facing approved by the City and landscaping provided for screening.

Where allowed, underground vaults shall be equipped with a hatch as described in the Department of Ecology Eastern Washington Storm Water Management Manual, latest edition, rather than a standard manhole cover.

Where allowed, underground vaults and tanks shall be accommodated with easements or setbacks large enough to provide for the complete replacement (without encroaching on any other structures or roads) of the structure should replacement be required in the future.

Open vaults with vertical side(s) shall be prohibited.

Bioswales shall only be constructed where approved by the City. Specifically, bioswales shall not be constructed in areas that are shaded during the growing season or between single family residences or commercial buildings.

Bioswales shall not be constructed with vertical side(s) unless approved by the City.

Bioswales shall not be designed with a longitudinal slope less than 1.5 percent.

All ponds shall be constructed with interior and exterior side slopes no steeper than 3 horizontal to 1 vertical. Ponds shall not be constructed with vertical side(s) unless approved by the City.

All pond access roads shall be connected to the public street in at least one location (or connected via a public access tract). No portion of the access road shall exceed a 15 percent grade. Bollards shall be installed approximately 25 feet from the edge of traveled way (or curb) in order to provide a safe parking area for maintenance personnel when accessing the pond.

Pond access roads shall not be dually used as a bicycle or equestrian trail.

For privately owned and operated storm drainage systems, the Developer shall execute and record a Declaration of Covenant that identifies the storm drainage system by legal description, allows access to the city to inspect and maintain, if necessary, and identifies the private owner as the party responsible for operation and maintenance. Covenant shall be recorded at the County prior to final approval of the project.

All stormwater drainage systems serving more than one single parcel not located within the public right-of-way or dedicated drainage tract shall be located within a drainage easement granted to a specific party. All easements shall be of sufficient width to allow complete replacement of the identified storm system component without encroaching into the foundation support of nearby buildings, walls, roads, steep slopes, driveways, sidewalks, or other structures.

All easements shall be provided in a form acceptable to the city and recorded at the County assessor's office prior to allowing the construction of a building on the property, or prior to recording of a plat. For land subdivisions, the easements may be shown on the plat map so long as the plat map identifies the specific party to which the easement is granted, the restrictions for the grantee and grantor, and clearly identifies the dimensions of the easement(s).

No public storm drainage easement shall be less than 10 feet in width. Where the easement is provided to gain access to a structure (catch basin, manhole, inlets) the easement width shall not be less than 15 feet.

Pipes and swales not located in the center of the easement shall have at least 5 feet of easement width from the pipe or swale to the edge of the easement.

Easements shall be located entirely on a single property and shall not be split along property lines.

Where easements are provided between properties to convey runoff from an upstream property to a downstream conveyance system within a single project (e.g., subdivision), the conveyance system shall be installed as a requirement of final plat approval. This will ensure that landscaping and other improvements installed on the downstream properties where the easement is located will not be impacted when the upstream property develops and installs its conveyance system.

Where the ground surface slopes upwards from a sidewalk, the City may require that a subsurface drain be installed behind the sidewalk to collect groundwater and shallow surface runoff to avoid icing, moss, and staining on the sidewalk.

## **8.02 Design Standards**

Project plans shall have a horizontal scale 20 feet to the inch and a vertical scale of not more than 5 feet to the inch.

The design of storm drainage and detention systems shall depend on their type and local site conditions. The design elements of storm drainage systems shall conform to the OMC and the City Standards as set forth herein. The following design considerations shall apply:

The use of commercial parking lots for detention of stormwater will be reviewed by the City and approved or denied based on the design, location and general parameters of the project. The detention area shall be situated away from areas of pedestrian movement. The maximum depth of water in parking lot storage shall be limited to six inches. Curbs cannot be used for storage.

Maximum catch basin spacing shall be 200 feet on road grades up to three percent, 300 feet when the road grade is three percent or greater, and 500 feet maximum on main storm drains between access structures, whether catch basins or manholes. No surface water (unless otherwise approved in writing by the City) shall cross any roadway.

Where storm systems are located outside an existing public right-of-way, permanent easements will be required for public or private maintenance of the system. Such easement shall be a minimum of 15 feet in width or twice the bury depth of the utility whichever is greater.

When appropriate, storm drain pipelines shall be sized and installed to the far property line(s) to serve tributary areas. They shall be appropriately sized to accommodate anticipated flows as further identified herein.

## **8.03 Conveyance**

Storm drain pipe within a public right-of-way or easement shall be sized to carry the maximum anticipated runoff (25-year design storm) from the possible contributing tributary area.

The minimum pipe size shall be 12 inches in diameter. Runoff shall be computed and, if the flow requires it, a larger pipe shall be used. Nothing shall preclude the City from requiring the installation of a larger sized main if the City determines a larger size is needed to serve adjacent areas or for future service.

When appropriate, storm drainage pipelines shall be sized and installed to the far property line(s) to serve tributary areas. They shall be appropriately sized to accommodate anticipated flows as further identified herein.

Storm drain gradients shall be such as to assure minimum flow velocity of 2.5 feet per second when flowing full.

All pipe for storm mains shall be "preapproved" by the Public Works Director based on localized conditions and comply with the following types:

Polyvinyl Chloride: PVC pipe shall conform to ASTM D3034, SDR 35 or ASTM F789 with joints and rubber gaskets conforming to ASTM D3212 and ASTM F477.

Polyethylene: PE smooth wall pipe per Advanced Drainage Systems (ADS) N-12 (bell and spigot), or City approved equal, constructed per Standard Specifications 7-04.

High Density Polyethylene Pipe (HDPE): HDPE pipe shall be SDR 25 butt-fused welded pipe high density, black, PE 3408. Pipe shall be made from premium high density polyethylene resin, qualified as Type III, Category 5, Class C, Grade P34 in ASTM D1248-81.

Rim (ground) and invert elevations for individual storm drainage stubs shall be shown on the final record drawings. In the field, individual storm drainage stubs shall be marked by use of a white 2-inch x 4-inch post stamped "STORM." Post shall be placed at the stub invert and shall protrude from ground at a minimum of three feet.

#### **8.04 Connections**

Connections of storm drain pipe leading from an existing street inlet location may be made into an existing main storm drain only with a new structure, subject to case-by-case review and approval of the Public Works Director and subject to the following additional requirements:

The inlet structure shall be a catch basin and not a simple inlet lacking a catch or drop section.

Length of inlet connection shall be as approved by the Public Works Director.

#### **8.05 Manholes (Type 2)**

Type 2 Manholes (48-inch diameter or larger) shall be of the offset type and shall be pre-cast concrete sections with either a cast in place base, or a pre-cast base made from a 3,000 psi structural concrete. Joints between pre-cast wall sections shall be confined O-ring or as otherwise specified. For connections to existing systems, a concrete coring machine, suitable for this type of work, shall be utilized in making the connection. The existing manhole shall be re-channeled as required. The new pipe connection shall be plugged (water tight) until the new pipe system has been installed and approved. The Contractor shall be responsible for any existing defects in the existing manhole unless these defects are witnessed by a representative of the City prior to any work being performed to make the connection. The Contractor shall be required to remove any and all deleterious material in the existing manhole and downstream reaches as a result of his/her work.

### **Manhole Sections**

Manhole sections shall be placed and aligned so as to provide vertical sides and vertical alignment of the ladder steps. The completed manhole shall be rigid, true to dimension, and be water tight. Rough, uneven surfaces will not be permitted. The mortar used between the joints in the pre-cast sections and for laying manhole adjusting bricks shall be composed of one part cement to two parts of plaster sand. All joints shall be thoroughly wetted and completely filled with mortar, smoothed both inside and outside to insure water tightness. The outside and inside of pre-cast concrete manhole sections shall be plastered and troweled smooth with 1/2-inch (minimum) of mortar in order to attain a watertight surface.

### **Manhole Steps**

Manhole steps shall be polypropylene, Lane International Corp. No. P13938 or equal. Ladders (maximum 3-foot length) shall be polypropylene Lane International Corp. or equal, and shall be compatible with steps.

### **Grade Adjustment**

Where work is in public rights-of-way, a maximum of 16 inches shall be provided between the top of the cone or slab and the top of the manhole frame.

### **Channels**

Channels shall be made to conform accurately to the storm sewer grade and shall be brought together smoothly with well-rounded junctions, satisfactory to the Public Works Director. Allowances shall be made for a one-tenth foot drop in elevation across the manhole in the direction of flow. Channel sides shall be carried up vertically from the invert to three-quarters of the diameter of the various pipes. The concrete shelf shall be warped evenly and sloped 3/8-inch per foot to drain. Rough, uneven surfaces will not be permitted. Channels shall be constructed to allow the installation and use of a mechanical plug or flow meter of the appropriate size.

### **Lift Holes and Steel Loops**

All lift holes shall be completely filled with expanding mortar, smoothed both inside and outside, to insure water tightness. All steel loops shall be removed, flush with the manhole wall. The stubs shall be covered with mortar and smoothed. Rough, uneven surfaces will not be permitted.

### **Frames and Covers**

Frames and covers shall be ductile iron. Castings shall be free of porosity, shrink cavities, cold shuts or cracks, or any surface defects which would impair serviceability. Repair of defects by welding, or by the use of "smooth-on" or similar material, will not be permitted. Frames and covers shall be machine

finished or ground on seating surfaces so as to assure non-rocking fit in any position and interchangeability of covers. Rings and covers shall be adjusted to conform to the final finished surface grade of the street or easement to the satisfaction of the Public Works Director. Manhole frames and covers shall be as manufactured by D&L Foundry, Model No. A-2000, or approved equal. All manhole covers shall have the words "Storm" and "City of Othello" cast integrally onto its surface.

#### **8.06 Survey Staking**

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor directing and/or performing such work shall be currently licensed by the State of Washington to perform said tasks.

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

#### **8.07 Trench Excavation**

Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.

Trenches shall be excavated to the line and depth designed by the City and per City standards. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency and in compliance with all safety requirements of the prevailing agencies. See Detail. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The Contractor shall maintain sufficient pumping equipment on the job to ensure that these provisions are carried out.

The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth six inches below storm line grade. Where materials are removed from below the pipeline grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without specific written approval of the City, and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.

The bedding course shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to facilitate the construction of pipe joints.

## 8.08 Bedding

### 1. Bedding for Storm Sewer Pipe

#### A. PVC Pipe (All Sizes)

Pipe bedding material to be installed and compacted under, around and above all pipe as specified in this Section shall be clean, well-graded sand or sand/gravel mixture with a maximum particle size of 5/8 inch, entirely free of clay, silt, organic or deleterious matter and frozen material. Minimum material weight shall be 110 pounds per cubic foot at 95% relative compaction. Bedding shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing*</u>
3/4" Square	100
3/8" Square	95-100
U.S. No. 8	0-10
U.S. No. 200	0-3
Sand Equivalent	35 MIN.

\*All percentages are by weight. Native Material may not be used for bedding.

## 8.09 Backfilling

Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected material shall be placed and compacted around and under the storm drain by hand tools. Special precautions should be provided to protect the pipe to a point 12 inches above the crown of the pipe. The remaining backfill shall be compacted to 95 percent of the maximum density in traveled areas, and 95 percent outside driveway, roadways, road prism, shoulders, parking or other traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. Typically, trench sections crossing existing roadways, in roadway "prisms" or beneath traffic bearing areas shall be backfilled and compacted with crushed surfacing top course. Due to localized conditions, the City may allow/permit the backfill of the trench section with suitable excavated material, as determined by the City, or if this material is not available from trenching operations, the City may order the placing and compaction of bank run gravel conforming with Section 9-03.19 of the Standard Specifications or controlled density fill (CDF) conforming with Section 2-09.3(1)E of the Standard Specifications for backfilling the trench. All excess material shall be loaded and hauled to waste.

### **8.10 Cleaning and Testing**

Prior to the completion of work, the constructed storm drainage system shall be cleaned and tested in accordance with Section 7-04.3(1) of the Standard Specifications.

All lines shall be flushed clean of all debris by jetting with clean water prior to acceptance. The debris shall be intercepted and collected at the nearest downstream point of access. The material shall then be waste-hauled to an approved dump site.

Water for flushing shall be made available and obtained from the City. However, the City reserves the right to operate all hydrants at times and locations convenient to their schedule and available personnel.

### **8.11 Inspections**

The Contractor shall request for inspection a minimum of 48 hours prior to the Contractor's scheduled need. Inspection shall be required for the following items of work:

1. Pipe and bedding installation.
2. Backfill and compaction.
3. Grouting catch basins.

Upon completion of the project all storm sewer install shall be inspected with television inspection equipment. The Contractor shall provide the City with a copy of the inspection and shall have the City present during the television inspection.

### **8.12 Street Patching and Restoration**

See Chapter 5 for requirements regarding street patching.

### **8.13 Erosion Control**

The detrimental effects of erosion and sedimentation shall be minimized by conforming with the following general principles:

- Soil shall be exposed for the shortest possible time.
- Reducing the velocity and controlling the flow of runoff.
- Detaining runoff on the site to trap sediment.
- Releasing runoff safely to downstream areas.

In applying these principles, the Developer and/or Contractor shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop materials; providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible. All erosion control shall conform to the 2005 Department of Ecology Eastern Washington Storm Water Management Manual.

A. Trench Mulching

Where there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, backfill material shall be compacted and held in place by covering the disturbed area with straw and held with a covering of jute matting or wire mesh anchored in place.

B. Cover-Crop Seeding

A cover crop shall be sown in all areas excavated or disturbed during construction that were not paved, landscaped and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original or superior condition.

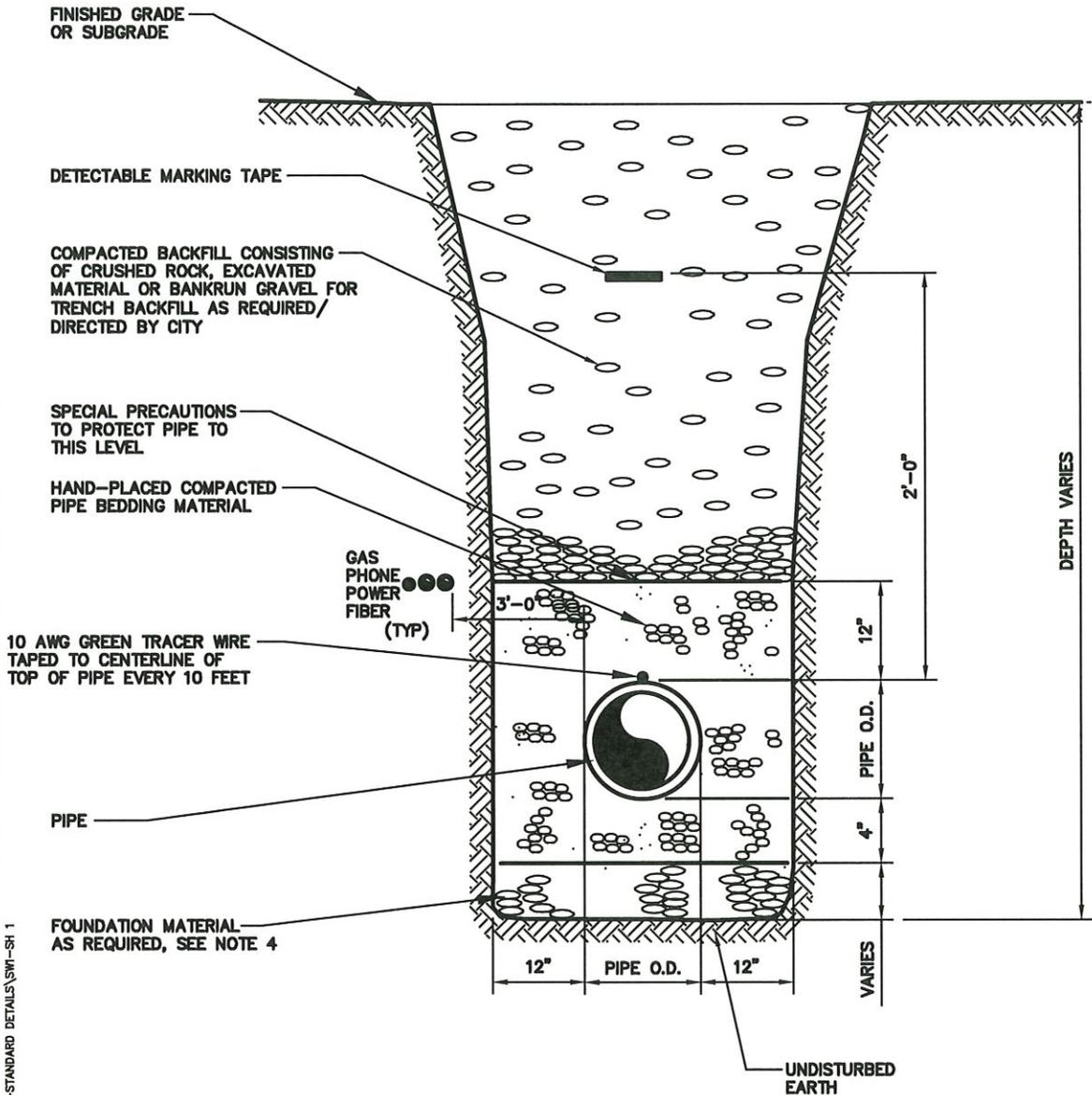
Cover-crop seeding shall follow backfilling operations.

The Developer and/or Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be re-seeded if required and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

During winter months, the Contractor may postpone seeding, if conditions are such that the seed will not germinate and grow. The Developer and/or Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown and affords protection from erosion.

The cover crop shall be sown at a rate of 10 to 15 pounds of seed per acre using a hand or power operated mechanical seeder capable of providing a uniform distribution of seed.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SW-STANDARD DETAILS\SW-SH 1



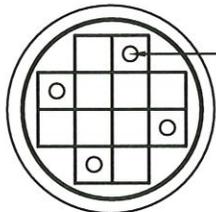
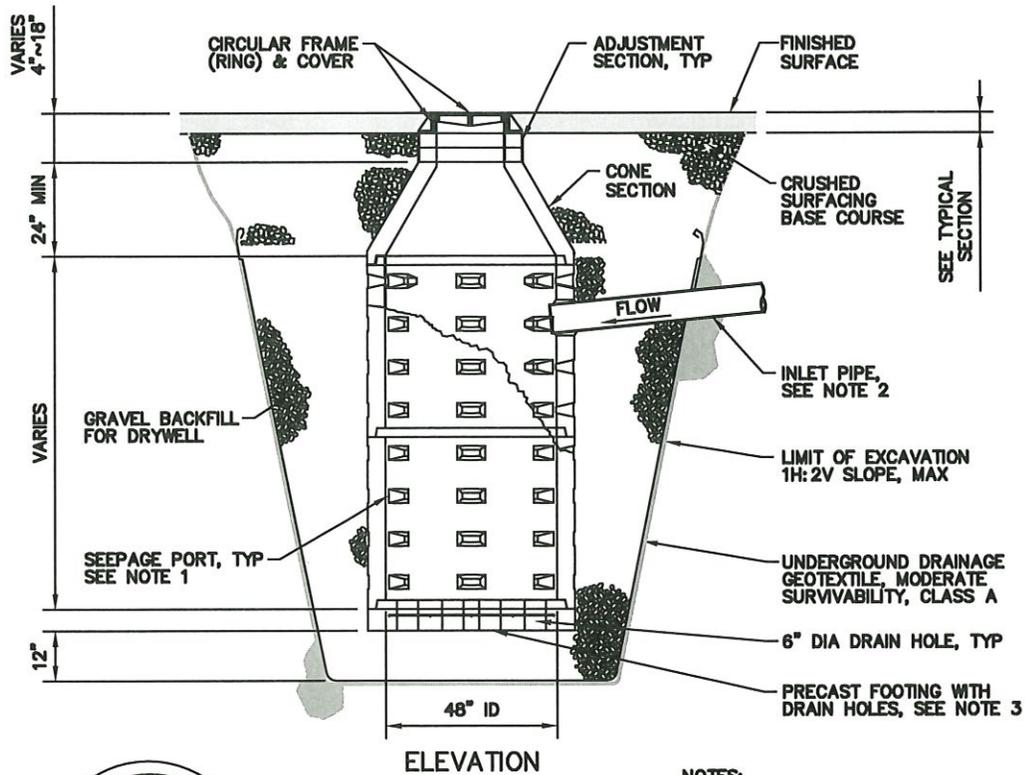
**NOTES:**

1. BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH THE CITY STANDARDS AND/OR THE STATE OR COUNTY PERMIT REQUIREMENTS (AS MAY BE REQUIRED).
2. ACTUAL SLOPE OF TRENCH SIDES TO BE DETERMINED BY CONTRACTOR TO FIT THE METHOD OF CONSTRUCTION AND ALL SAFETY REQUIREMENTS.
3. NO ADDITIONAL CONDUITS OR PIPES SHALL BE WITHIN 3' OF THE STORM MAIN.
4. EXCAVATE UNSUITABLE MATERIAL DOWN TO UNDISTURBED EARTH AND REPLACE WITH FOUNDATION MATERIAL PER SECTION 9-03.9 (1), "BALLAST", OF THE STANDARD SPECIFICATIONS, AS REQUIRED.
5. TRENCHES MAY BE BEDDED WITH CONTROLLED DENSITY FILL MATERIAL AS APPROVED BY CITY.
6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

**CITY OF OTHELLO**  
STANDARD DETAILS  
STORM DRAIN TRENCH SECTION  
FIGURE SW1-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





PRECAST FOOTING DETAIL

**NOTES:**

1. SEEPAGE PORT ORIENTATION VARIES AMONG MANUFACTURERS.
2. CONNECT INLET PIPE TO STRUCTURE USING PRECAST HOLE OR CORE DRILLED HOLE.
3. FOR DEPTHS OVER 15' USE 72" X 8" ALTERNATIVE PRECAST FOOTING.

**48" PRECAST CONCRETE DRYWELL**  
NTS

**NOTES:**

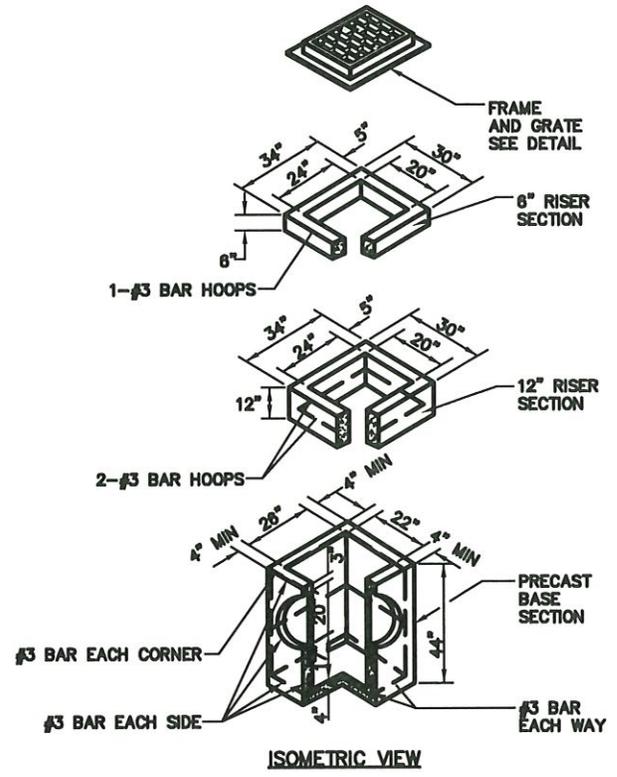
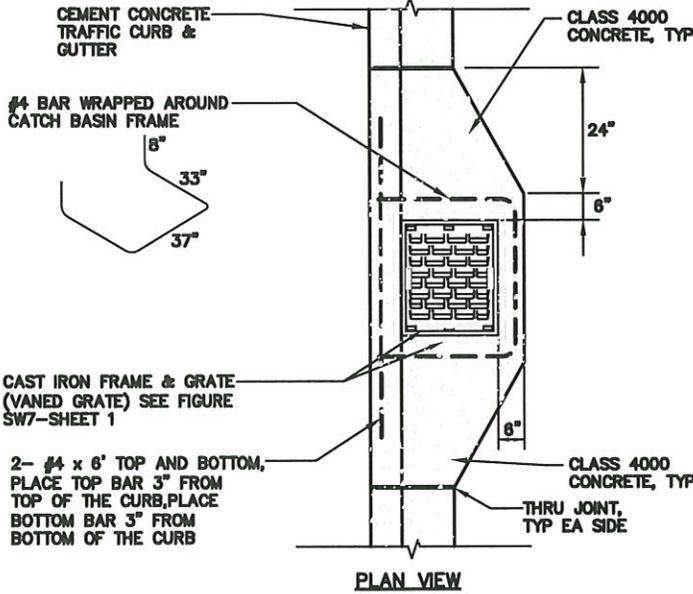
1. MINIMUM OF 1 4" ADJUSTMENT RING WITH A MAXIMUM OF 16" OF ADJUSTMENT.
2. PLACE CONCRETE AROUND OUTSIDE OF ADJUSTMENT RINGS AND RING TO PREVENT INFILTRATION/EXFILTRATION.
3. PRECAST CONE SECTION MAY BE CONCENTRIC OR ECCENTRIC.
4. GROUT SEAL PVC PIPE WHERE THE PIPE PENETRATES THE DRYWELL.
5. DRYWELLS NOT IN SIDEWALK SHALL BE PLACED IN A 6'x6" CONCRETE PAD AT FINISHED GRADE.
6. "DRAIN" AND "CITY OF OTHELLO" SHALL BE CAST IN THE LID.
7. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SW-STANDARD DETAILS\SW2-SH 1

CITY OF OTHELLO  
STANDARD DETAILS  
48" PRECAST CONCRETE DRYWELL  
FIGURE SW2-SHEET 1

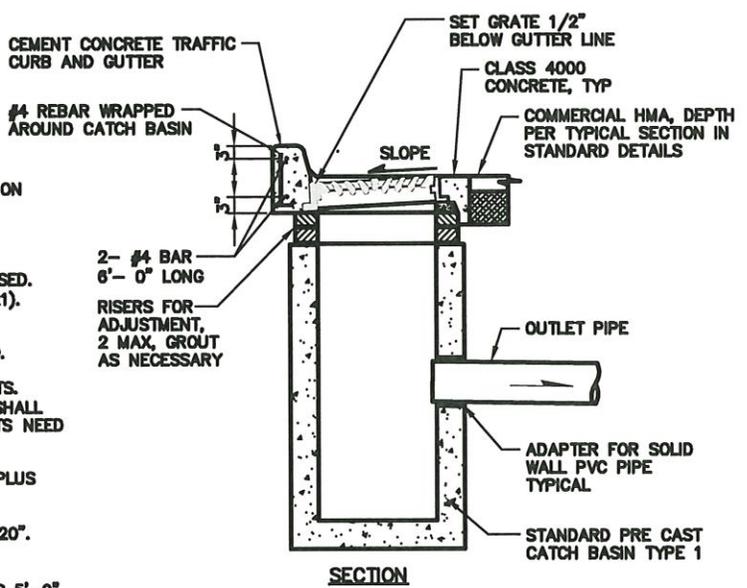
#1	November, 2014
#2	June, 2016
REVISION #	DATE





**NOTES:**

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 7-05 WSDOT/APWA STANDARD SPECIFICATIONS, UNLESS OTHERWISE SHOWN ON PLANS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-821D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT/APWA STANDARD PLAN 8-5.60-01.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
13. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.



**CATCH BASIN TYPE 1**  
NTS

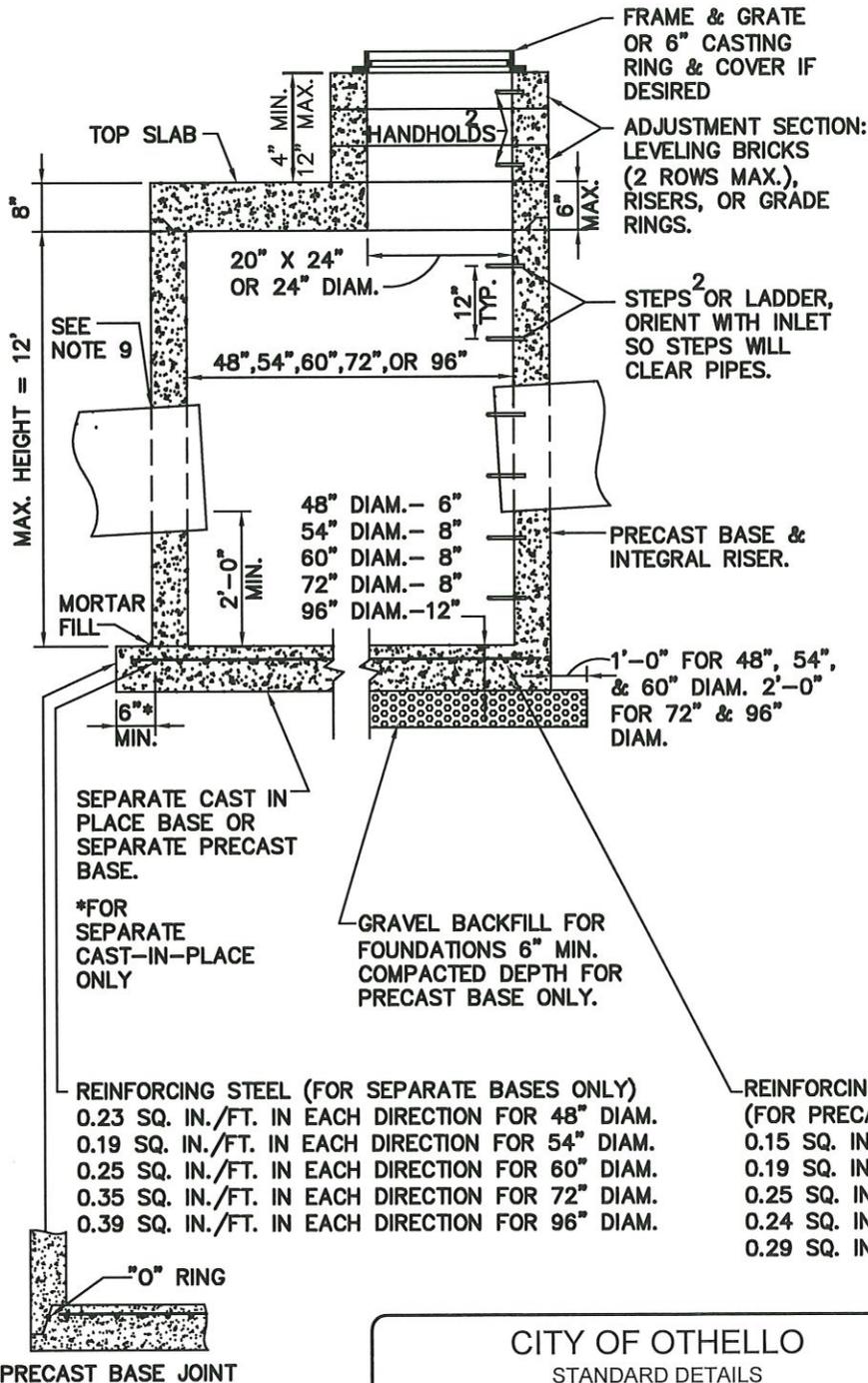
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<b>CITY OF OTHELLO</b> STANDARD DETAILS CATCH BASIN - TYPE 1 FIGURE SW3-SHEET 1		#1 November, 2014	
#2 June, 2016		#3 _____	
REVISION #	DATE	ESTABLISHED 1910	

**NOTES:**

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP TO THE FINISHED GRADE. ALL STEPS AND HANDHOLDS SHALL BE MADE OF POLY PROPYLENE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.

4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUDED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" CATCH BASIN, 42" FOR 54" C.B., 48" FOR 60" C.B., 60" FOR 72" C.B., 84" FOR 96" C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" C.B.; 12" FOR 72" AND 96" C.B.
6. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 OF THE STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. INSTALL PIPE TO MANHOLE CONNECTION AS FOLLOWS: FOR HDPE USE KOR-N-SEAL FOR D.I. USE KOR-N-SEAL FOR PVC USE KOR-N-SEAL OR SAND COLLAR. FOR POLYETHYLENE (ADS) FOLLOW MANUFACTURER RECOMMENDATIONS.
10. "STORM" AND "CITY OF OTHELLO" SHALL BE CAST IN THE COVER.
11. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

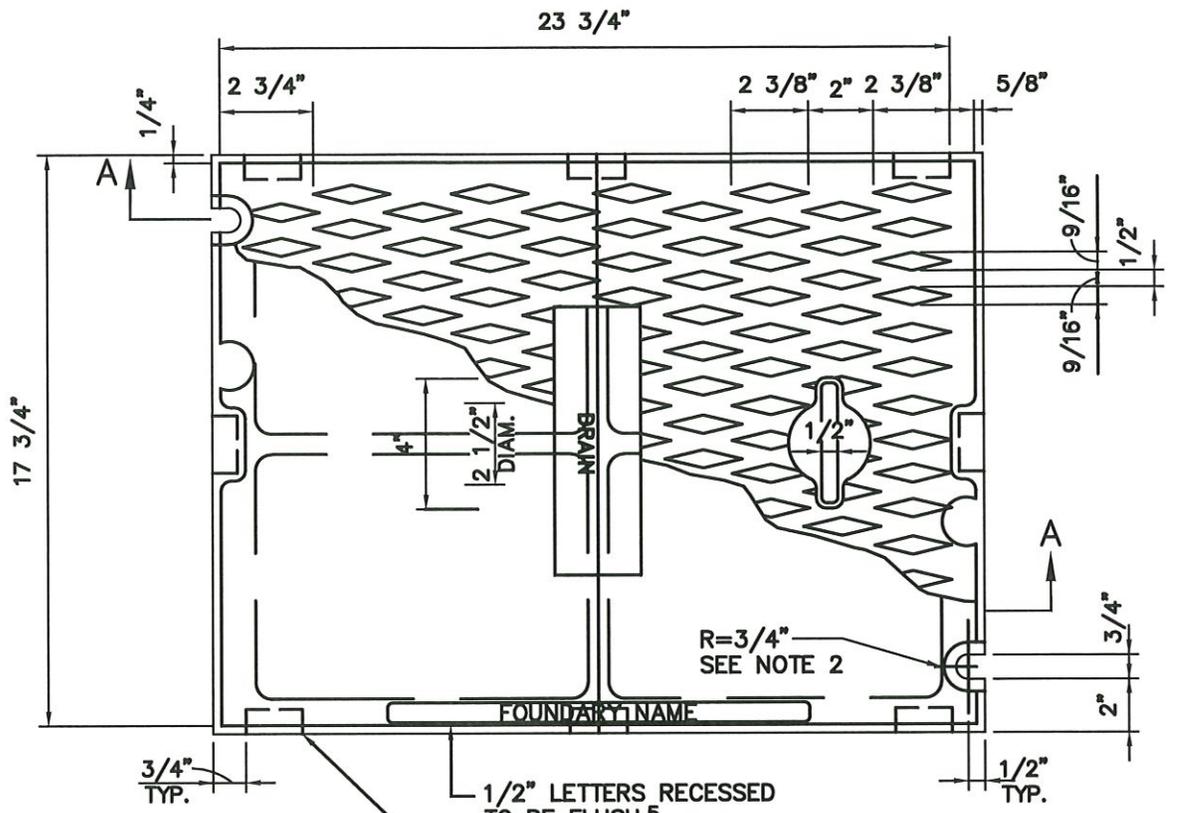


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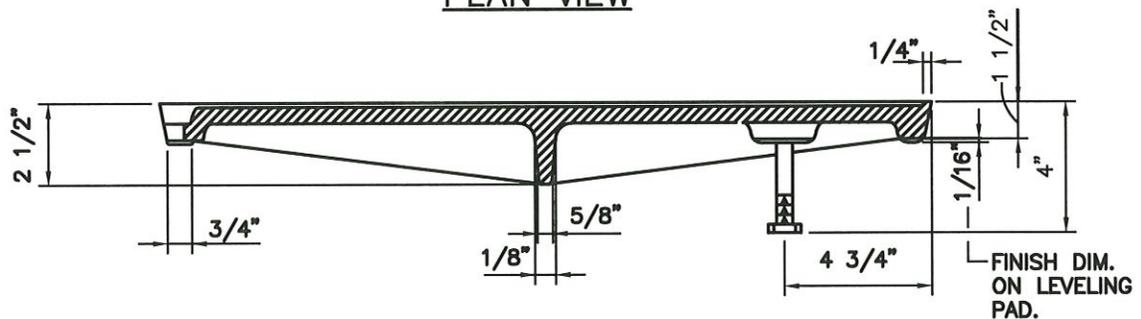
**CITY OF OTHELLO**  
STANDARD DETAILS  
CATCH BASIN - TYPE 2 (48", 54", 60", 72" AND 96")  
FIGURE SW4-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





PLAN VIEW



SECTION A-A

**NOTES:**

1. USE WITH FRAME DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 2" LONG.
3. COVER MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SHALL CONFORM TO SEC. 7.05 OF THE STANDARD SPECIFICATIONS.
5. COVER SHALL HAVE THE WORDS "DRAIN" AND "CITY OF OTHELLO" IN 2-INCH RAISED LETTERS.
6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

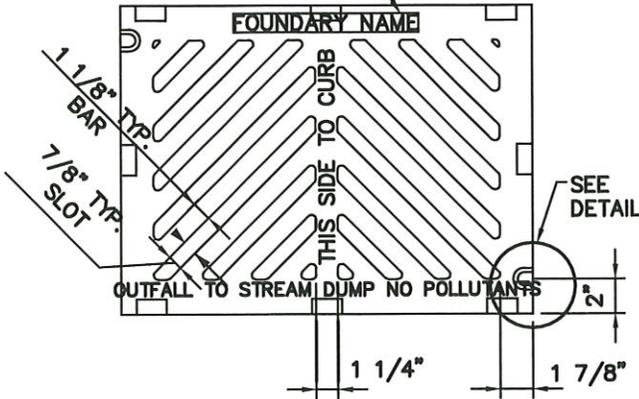
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CITY OF OTHELLO  
STANDARD DETAILS  
SOLID STORM DRAIN COVER  
FIGURE SW5-SHEET 1

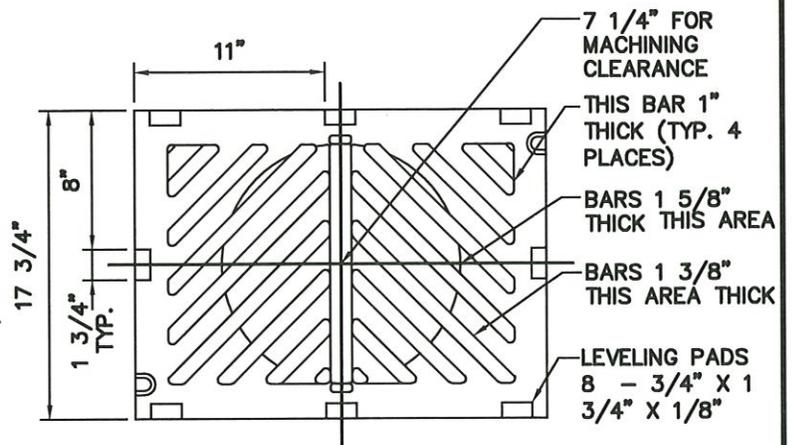
#1	November, 2014
#2	June, 2016
REVISION #	DATE



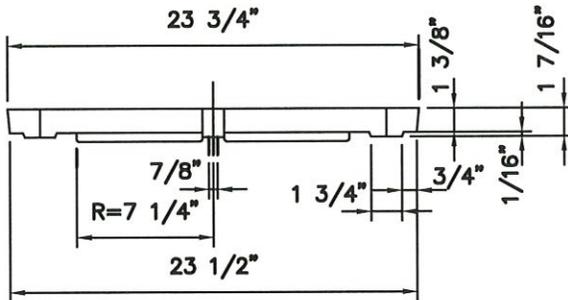
BOUNDARY NAME 1/2"  
LETTERS RECESSED TO  
BE FLUSH



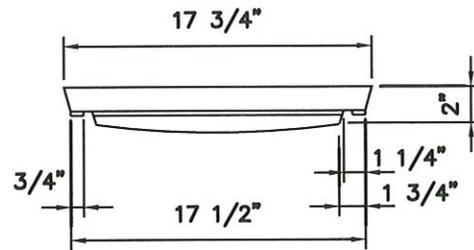
**TOP VIEW**



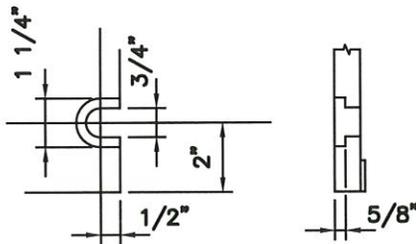
**BOTTOM VIEW**



**SIDE VIEW**

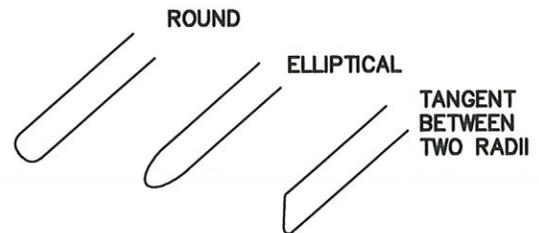


**END VIEW**



**SLOT DETAIL**

SEE NOTE 1



OPTIONAL DESIGN FOR  
GRATE OPENINGS ENDS

**NOTES:**

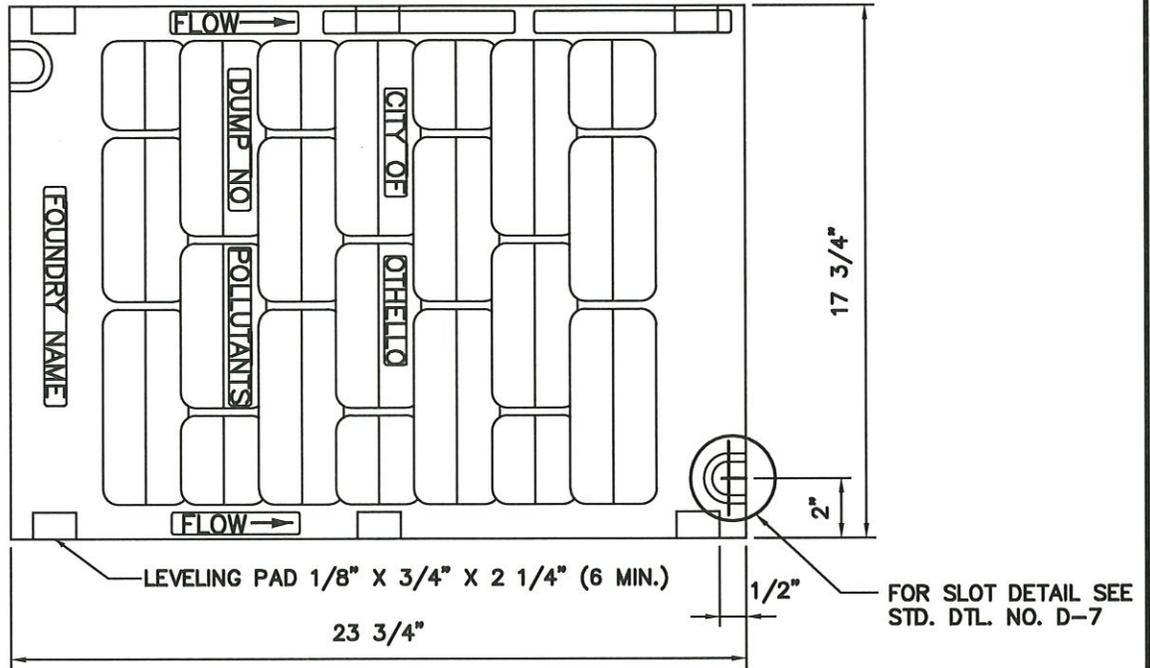
1. SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) BOLT.
2. GRATE SHALL BE DUCTILE IRON.
3. SHALL CONFORM TO SEC. 9-05.15 OF THE STANDARD SPECIFICATIONS.
4. USE VANED GRATE IN CURB LINE.
5. USE FRAME SHOWN IN STANDARD DETAIL SW-6.
6. "CITY OF OTHELLO" SHALL BE CAST IN THE LID.
7. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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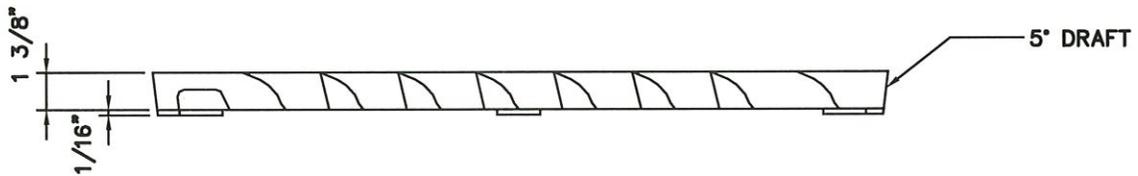
CITY OF OTHELLO  
STANDARD DETAILS  
PARKING LOT AREA GRATE  
FIGURE SW6-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





PLAN



ELEVATION

**NOTES:**

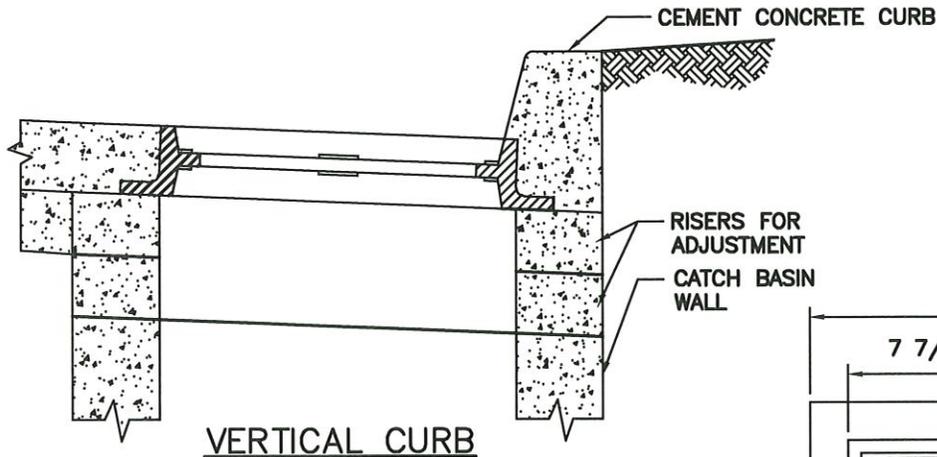
1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY ENGINEER.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 2" LONG. NOTE SLOT DETAIL. PROVIDE WHERE REQUIRED. ALL LIDS OUTSIDE OF ROADWAY TO BE LOCKED.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" AND "CITY OF OTHELLO" IN RAISED LETTERS SHALL BE LOCATED ON GRATE AS SHOWN, OR ON BORDER AREA.
5. SHALL CONFORM TO SEC. 7.05 OF THE STANDARD SPECIFICATIONS.
6. WELDING IS NOT PERMITTED.
7. EDGES SHALL HAVE 0.125" RADIUS, 0.125" CHAMBER OR COMPLETE DEBURRING.
8. USE A BI-DIRECTIONAL VANED GRATE IN SAG VERTICAL CURVES.
9. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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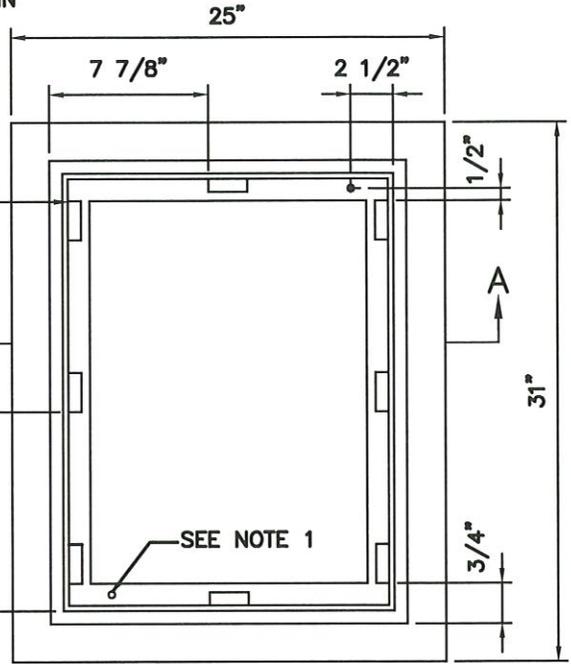
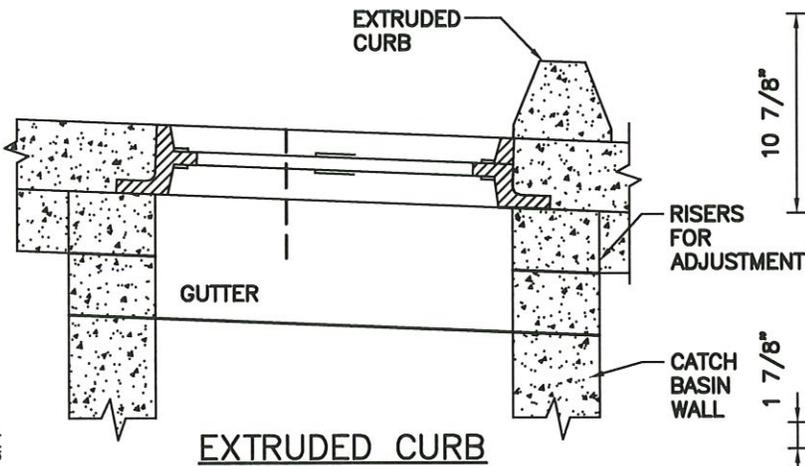
CITY OF OTHELLO  
STANDARD DETAILS  
VANED GRATE  
FIGURE SW7-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE

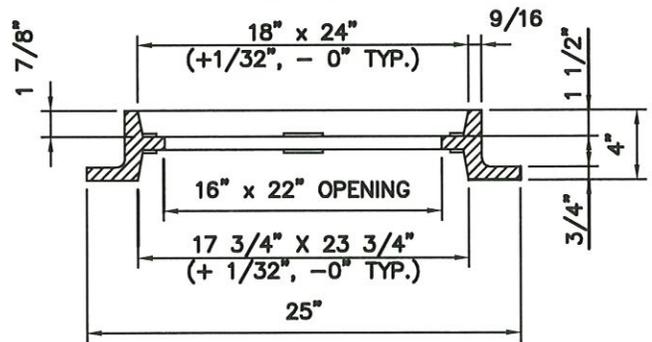




LEVEL PAD 16 - 3/4"  
X 2 1/4" X 1/8"



PLAN



SECTION A-A

**NOTES:**

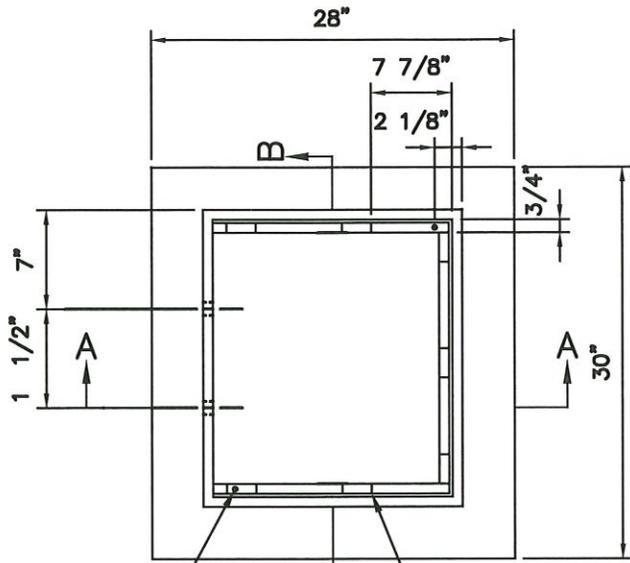
1. DRILL AND TAP FOR, AND PROVIDE, TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 2" LONG, WHERE REQUIRED. ALL LIDS TO BE LOCKED OUTSIDE OF ROADWAY.
2. FRAME MATERIAL IS CAST IRON PER ASTM A48 CLASS 30 OR BETTER.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
STANDARD FRAME INSTALLATION  
FIGURE SW8-SHEET 1

#1	November, 2014
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REVISION #	DATE

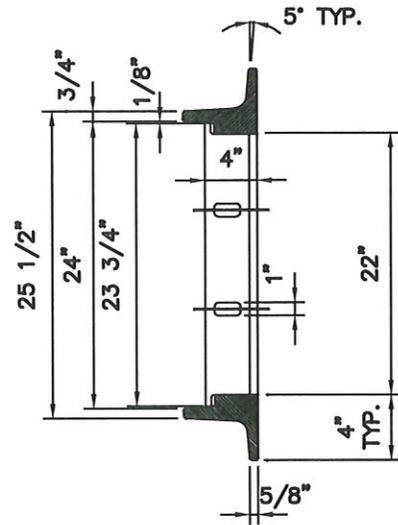




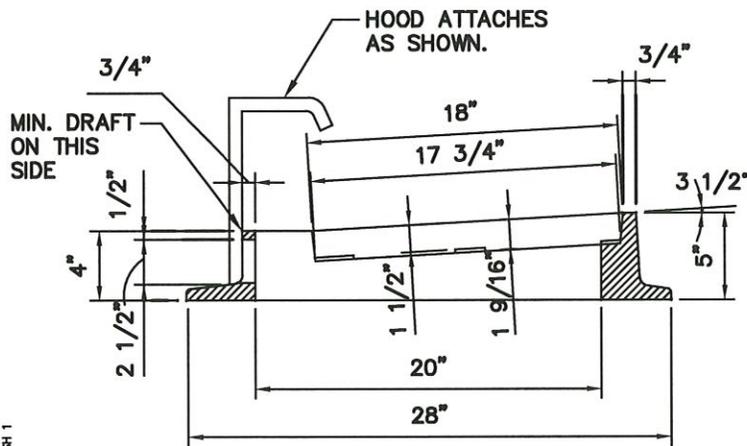
DRILL & TAP TWO  
5/8"-11NC HOLES  
THRU FRAME

LEVELING PAD  
7-1/8" X 3/4" X  
2 1/4" (TYP.)

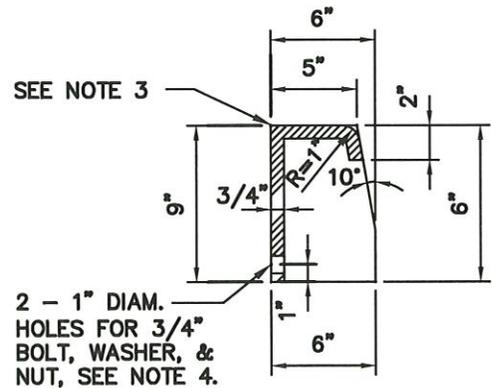
PLAN



SECTION B-B

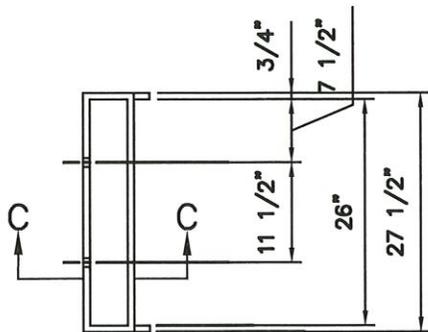


SECTION A-A



SECTION C-C

2 - 1" DIAM.  
HOLES FOR 3/4"  
BOLT, WASHER, &  
NUT, SEE NOTE 4.



HOOD DETAIL

**NOTES:**

1. MATERIAL SHALL CONFORM TO SECTION 9-05.15(2) OF THE STANDARD SPECIFICATIONS.
2. PATTERN ON TOP SURFACE OF HOOD SHALL BE 3/16" NON-SKID DIAMOND.
3. BOLT, WASHER, AND NUT SHALL BE GALVANIZED OR CORROSION RESISTANT.
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

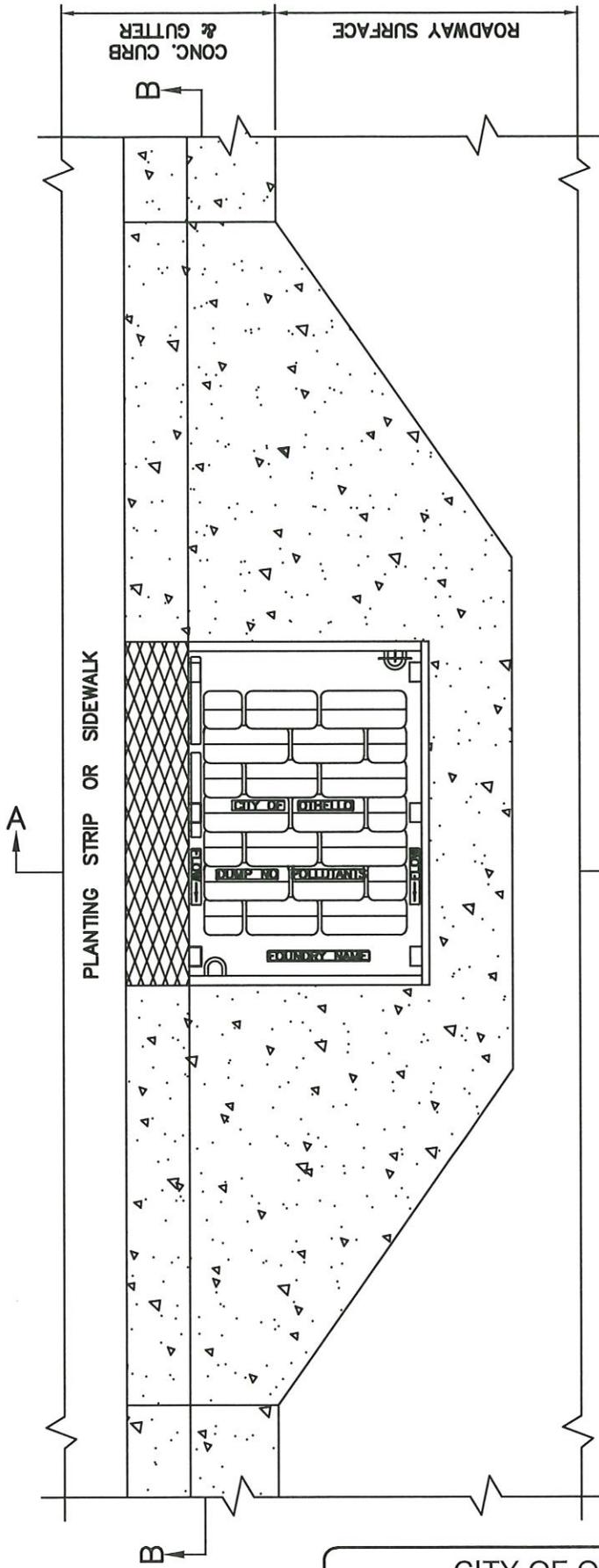
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CITY OF OTHELLO  
STANDARD DETAILS  
THROUGH CURB INLET FRAME  
FIGURE SW9-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



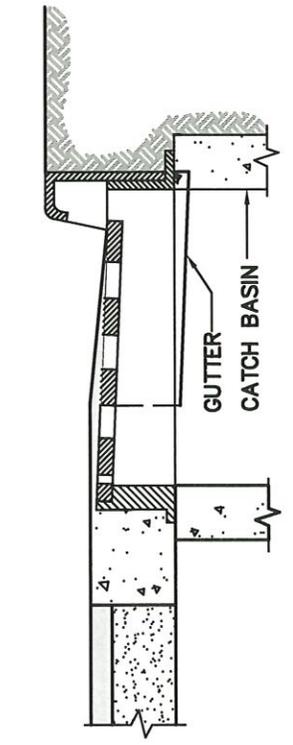
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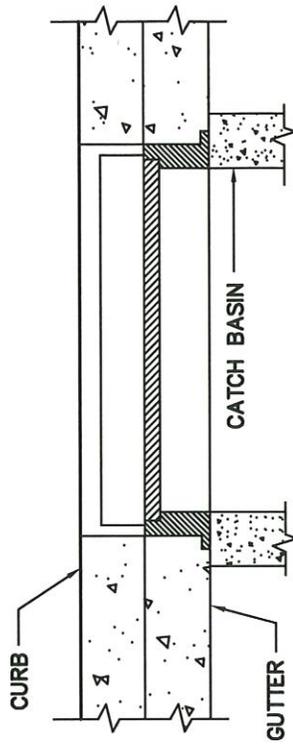
**NOTES:**

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. THROUGH CURB INLET TO BE USED IN SAG CURVES.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

**PLAN**



**SECTION A-A**

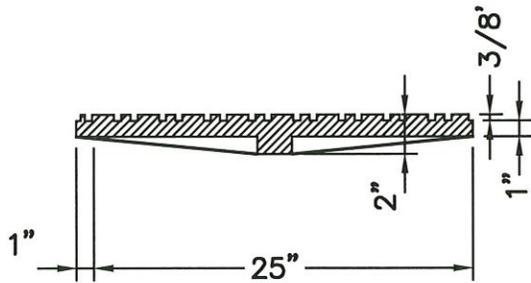
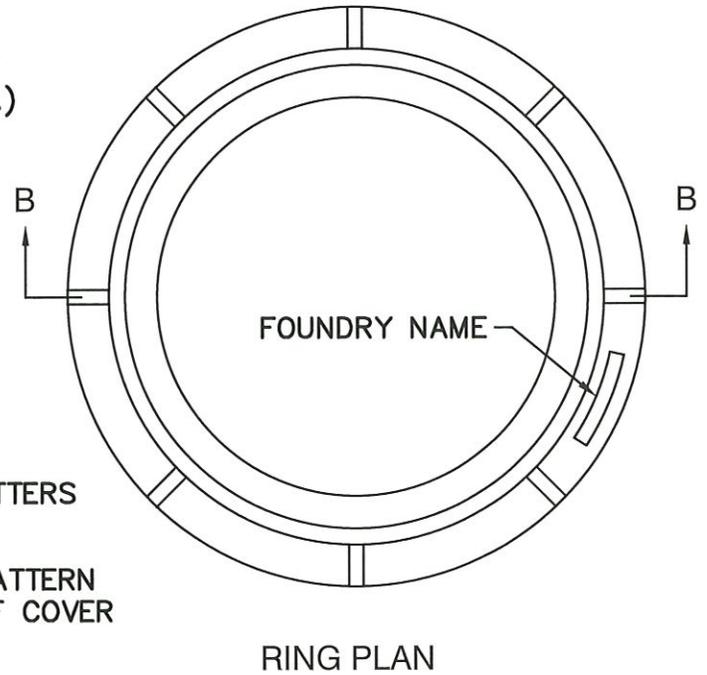
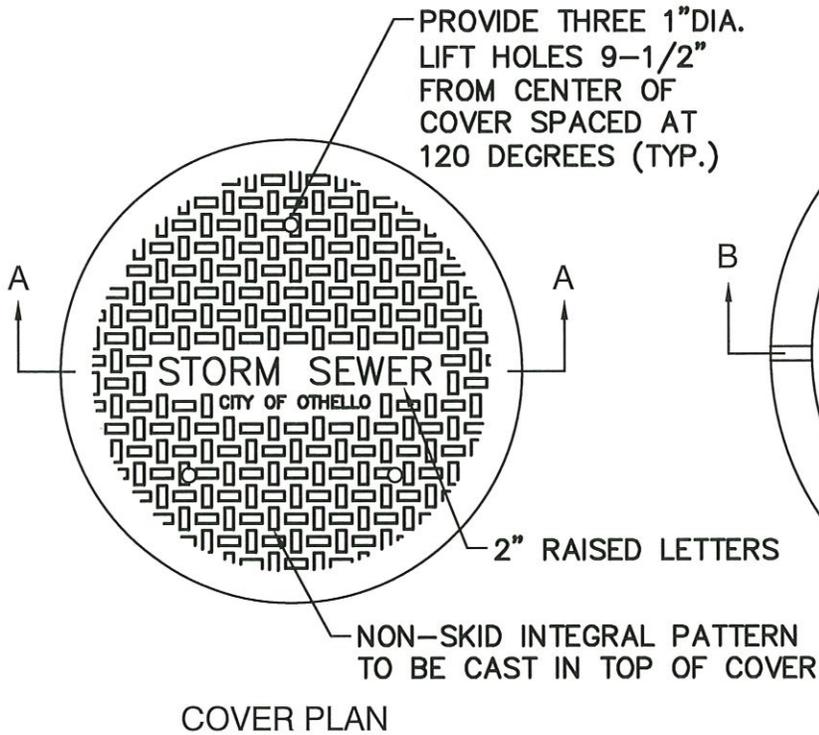


**SECTION B-B**

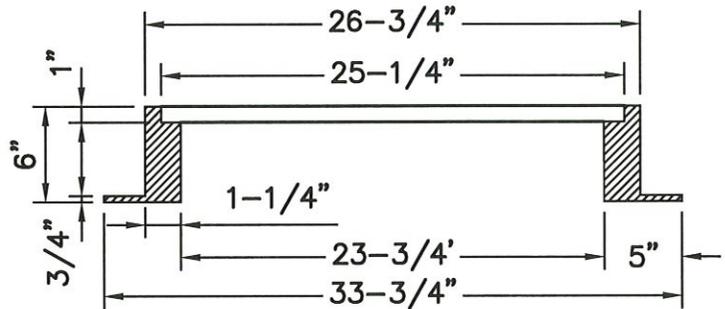
**CITY OF OTHELLO**  
STANDARD DETAILS  
THROUGH VERTICAL CURB INLET FRAME AND GRATE  
FIGURE SW10-SHEET 1

#1	November, 2016
#2	June, 2016
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SECTION A-A



SECTION B-B

**COVER NOTES:**

1. COVER MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
2. SHALL CONFORM TO SECTION 9-05.15 OF THE STANDARD SPECIFICATIONS, AS MODIFIED HEREIN.
3. APPROXIMATE WEIGHT OF COVER IS 150 LBS.
4. RATING - H20
5. IF THE PUBLIC WORKS DIRECTOR REQUESTS, USE WITH THREE LOCKING BOLTS 5/8" - 11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 2" LONG. DRILL HOLES SPACED 120", TO MATCH HOLES IN RING

**RING NOTES:**

1. DRILL AND TAP THREE 5/8"-11 NC HOLES THROUGH RING AT 120°.
2. RING MATERIAL IS GRAY IRON, ASTM A-48 CLASS 30
3. SHALL CONFORM TO SECTION 9-05.15 OF THE STANDARD SPECIFICATIONS, AS MODIFIED HEREIN.
4. APPROXIMATE WEIGHT OF RING IS 215 LBS.
5. RATING - H20.

**GENERAL NOTE:**

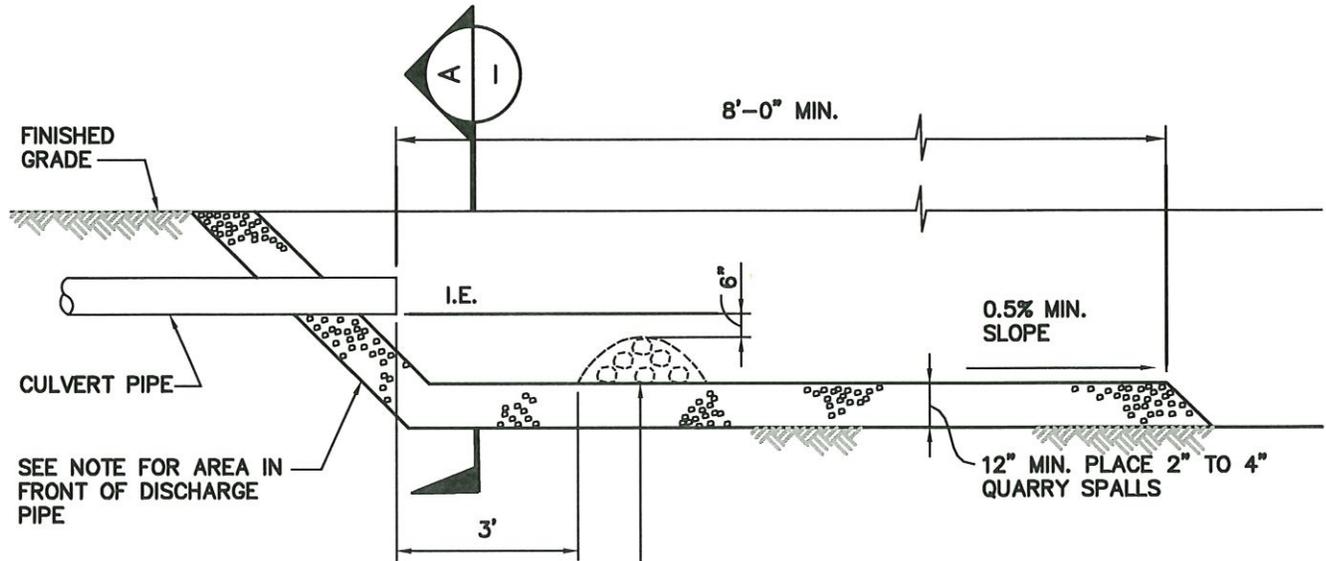
1. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

CITY OF OTHELLO  
STANDARD DETAILS  
24" MANHOLE RING AND COVER  
FIGURE SW11-SHEET 1

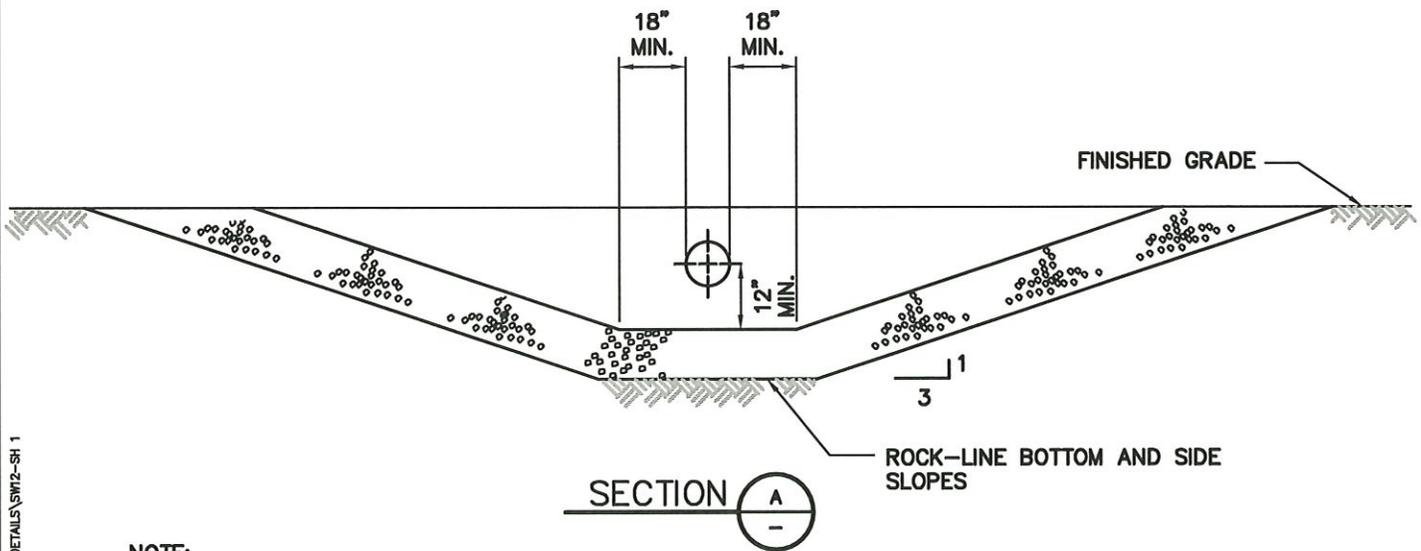
#1	November, 2014
#2	June, 2016
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PLACE QUARRY SPALLS IN A BERM ACROSS THE CHANNEL OF THE DITCH WHEN THE SLOPE OF THE DITCH IS GREATER THAN 3%, SEE NOTE 1



**NOTE:**

1. PLACE QUARRY SPALLS IN FRONT OF CULVERT DISCHARGE, ENGINEER SHALL SIZE QUARRY SPALL BERM.
2. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

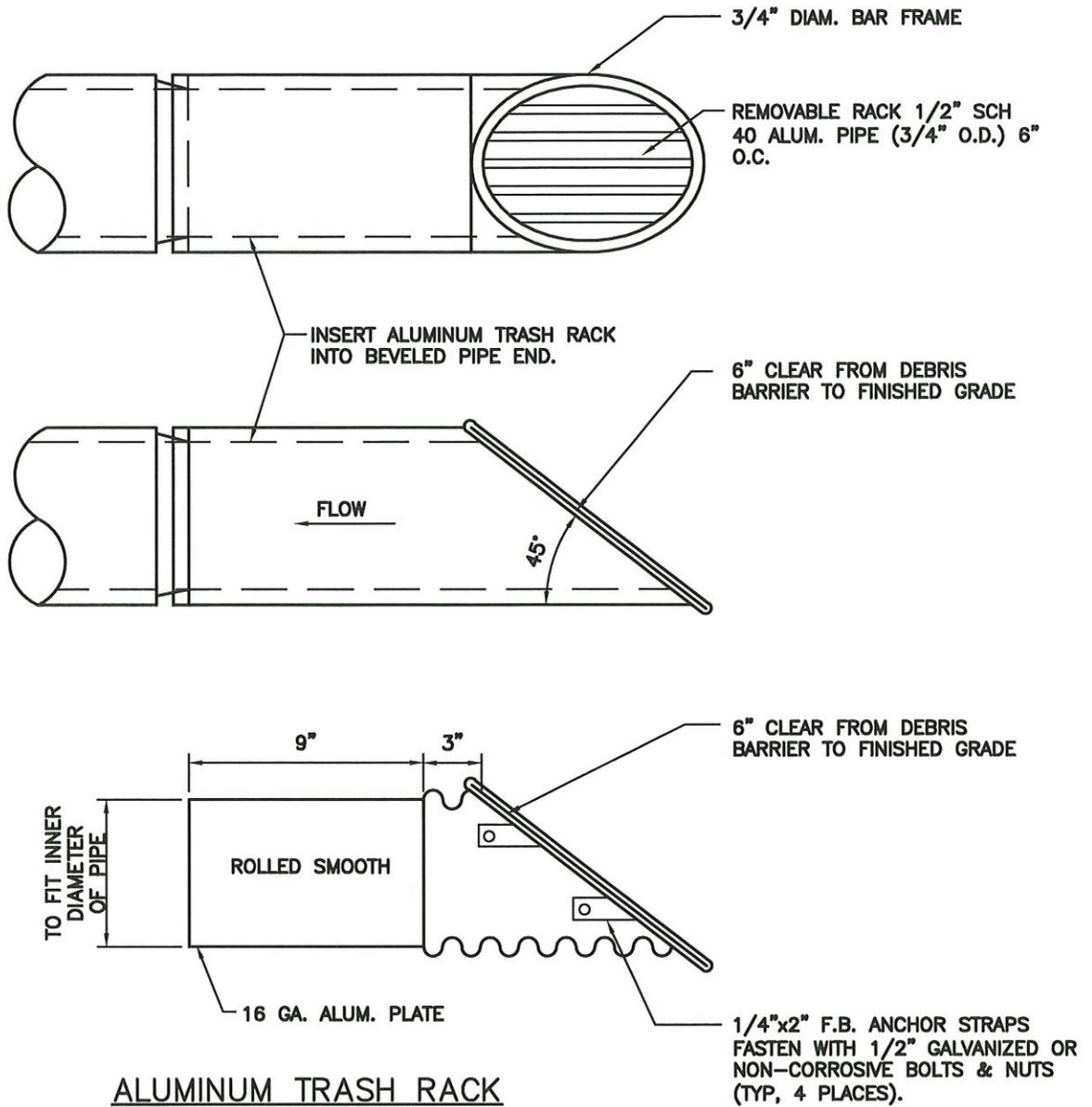
**RIPRAP AND ENERGY DISSIPATION FOR DITCH**

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CITY OF OTHELLO  
STANDARD DETAILS  
RIPRAP/DITCH DETAIL  
FIGURE SW12-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





**ALUMINUM TRASH RACK**

**NOTES:**

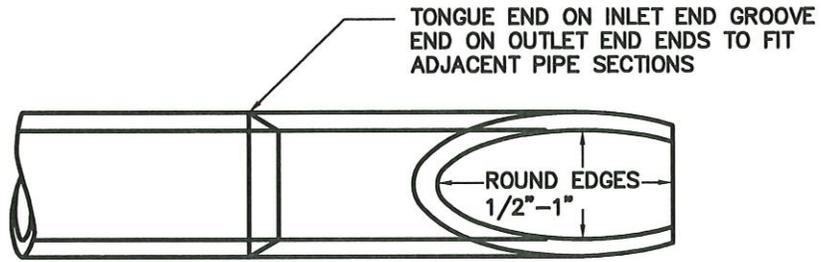
1. ALL STEEL PARTS MUST BE GALVANIZED & ASPHALT COATED (TREATMENT 1 OR BETTER).
2. CONTRACTOR TO VERIFY DIMENSIONS.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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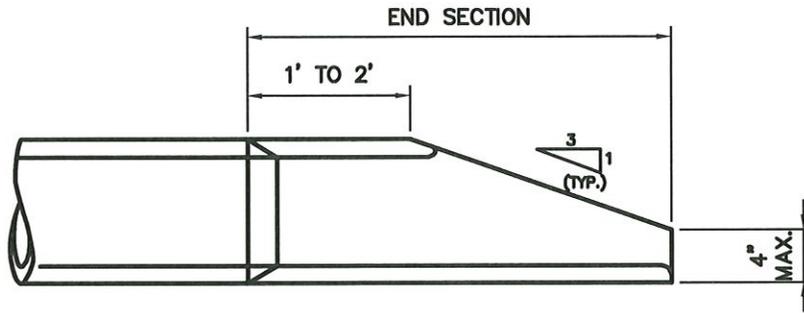
CITY OF OTHELLO  
STANDARD DETAILS  
TRASH RACK DEBRIS BARRIER  
FIGURE SW13-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



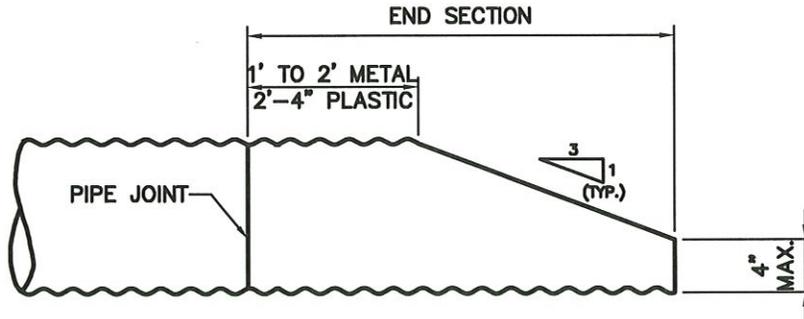


PLAN



ELEVATION

CONCRETE PIPE



METAL & THERMO-PLASTIC PIPE

NOTE:

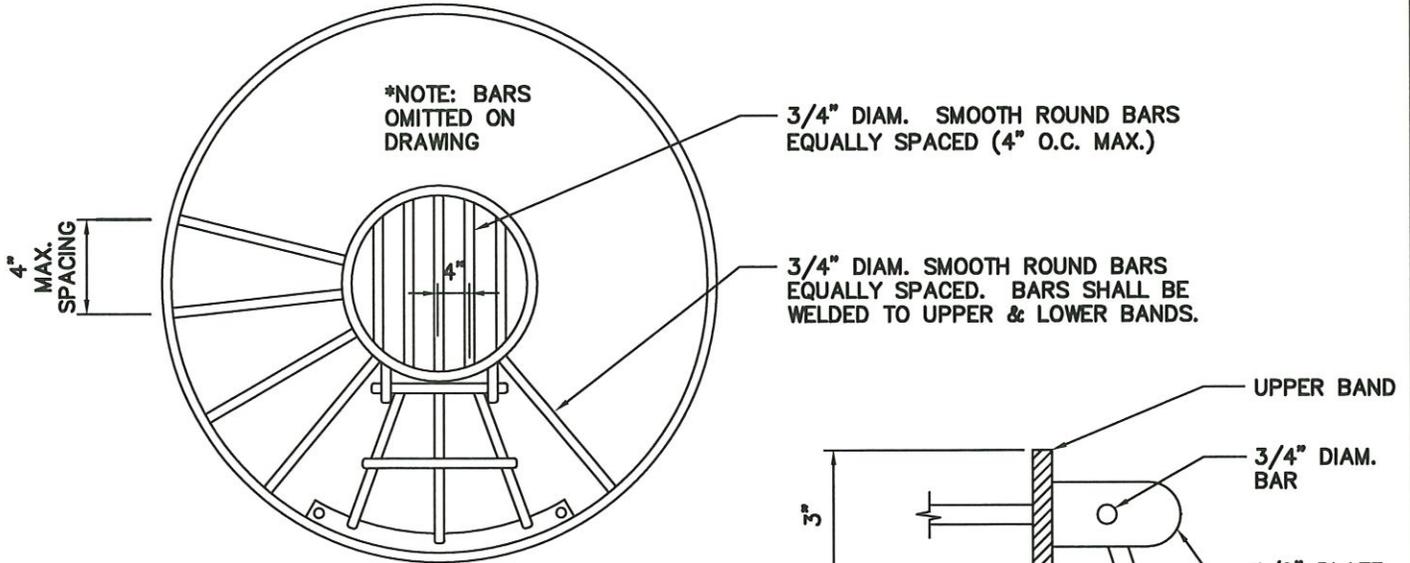
1. SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END. WHEN CULVERT IS ON SKEW, BEVELED END SHALL BE ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM 3:1, PIPE SHALL BE BEVELED TO MATCH SLOPE.
2. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SW-STANDARD DETAILS\SW14-SH 1

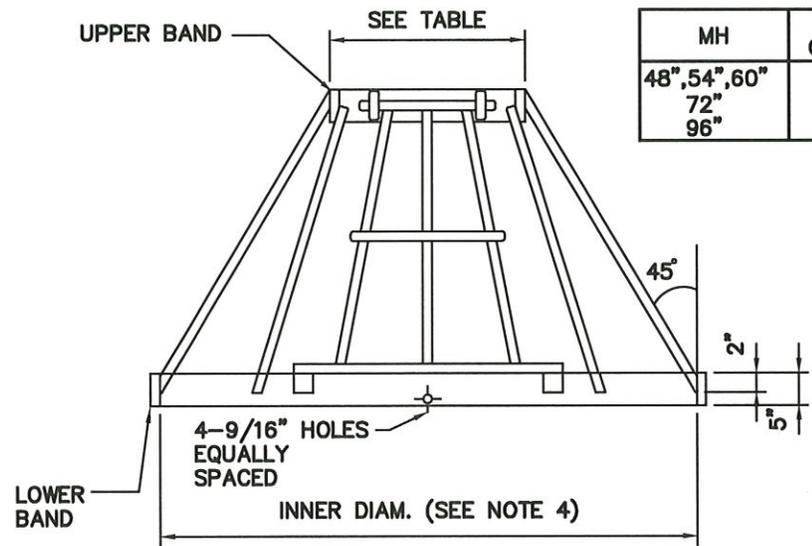
CITY OF OTHELLO  
STANDARD DETAILS  
BEVELED END PIPE SECTION  
FIGURE SW14-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



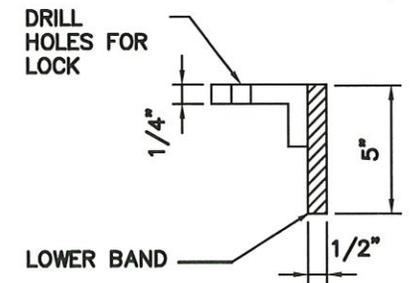
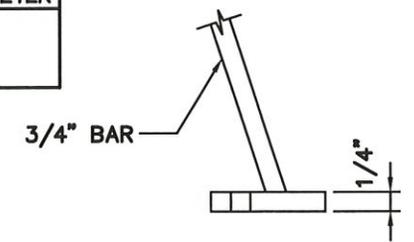
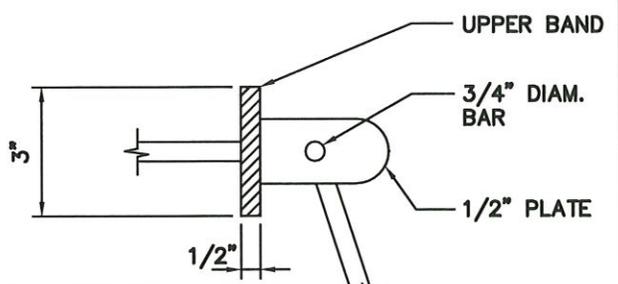


**PLAN**



**ELEVATION**

MH	UPPER BAND OUTER DIAMETER
48", 54", 60"	36"
72"	42"
96"	



**ENTRY GATE DETAIL**

- NOTES:**
1. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.
  2. STEEL DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111).
  3. ALUMINUM IS AN OPTIONAL CAGE MATERIAL.
  4. COVER BAND DIMENSIONS TO MATCH STRUCTURE.
  5. ALL DEBRIS CAGES SHALL BE LOCKED WITH CITY-ISSUED PADLOCK.
  6. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SW- STANDARD DETAILS\SW15-SR 1

**CITY OF OTHELLO**  
STANDARD DETAILS  
DEBRIS CAGE  
FIGURE SW15-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE



SECONDARY ORIFICES, TYP.  
SEE STD DWG SW-22

OVERFLOW INVERT EL. = \_\_\_\_\_  
ORIFICE DIA. = \_\_\_\_\_

OVERFLOW INVERT EL. = \_\_\_\_\_  
ORIFICE DIA. = \_\_\_\_\_

OVERFLOW INVERT EL. = \_\_\_\_\_  
ORIFICE DIA. = \_\_\_\_\_

SHEAR GATE SEE STD DWG SW-23.  
8" SIZE FOR 18" AND SMALLER  
- OUTLET PIPE 12" SIZE FOR  
24" AND LARGER - OUTLET PIPE

INV. EL. PER PLANS

OVERFLOW EL.

24"  
MIN.

6"

24" MIN

①

**NOTES:**

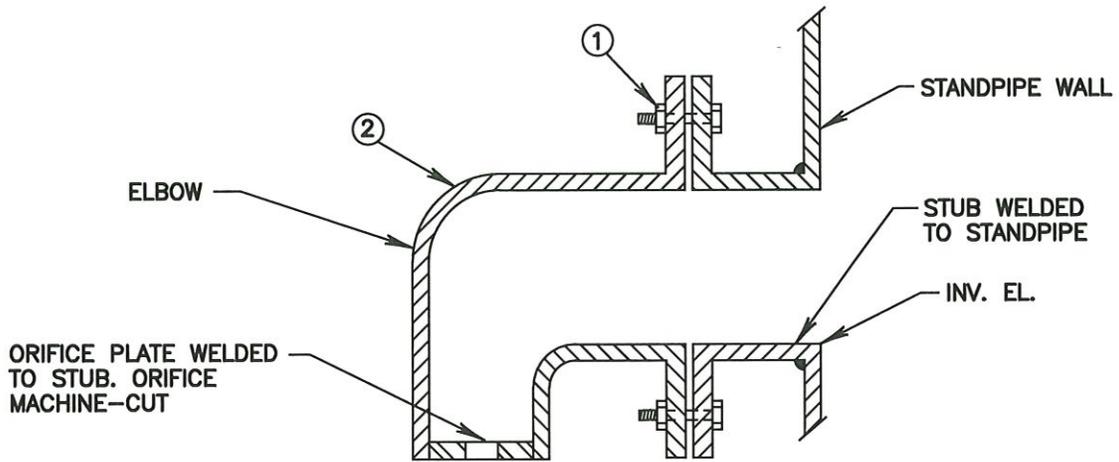
1. RESTRICTOR UNIT SHALL BE CONSTRUCTED OF CORRUGATED POLYETHYLENE PIPE AASHTO M294 TYPE S, POLYVINYL CHLORIDE (PVC) ASTM D-3034 SCHEDULE 40, OR ALUMINIZED CMP.
2. FOR PVC APPLICATIONS, ALL CONNECTIONS SHALL BE MADE USING STANDARD FITTINGS, NO WELDING SHALL BE USED.
3. FOR COMBINED WET/DETENTION PONDS, DELETE ORIFICE AT ①
4. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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**CITY OF OTHELLO**  
STANDARD DETAILS  
RESTRICTOR RISER  
FIGURE SW16-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





ALL PARTS TO BE HDPE OR PVC OR ALUMINUM EXCEPT AS NOTED

**NOTES:**

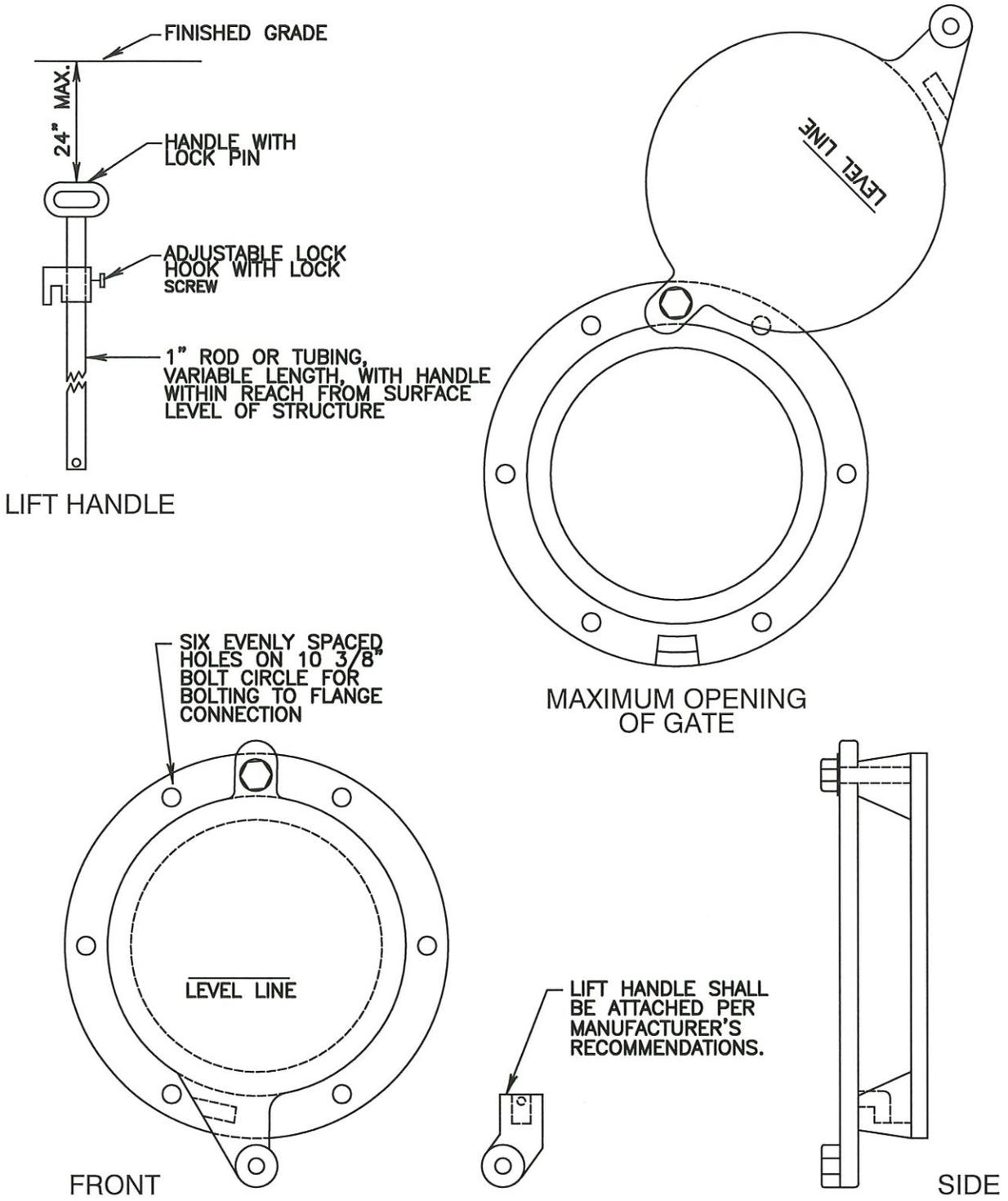
- ① 1/2" THICK BOLT FLANGE TAPPED FOR (3) 1/2" 1 DIAMETER NYLON BOLTS—INCLUDE A NEOPRENE GASKET (ELEVATION PER PLANS).
- ② WELDED 90 DEG. BEND (SIZE PER PLANS) WITH 1/2" THICK BOLT FLANGE DRILLED FOR 1/2" DIAMETER NYLON BOLTS.
3. ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

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CITY OF OTHELLO  
STANDARD DETAILS  
SECONDARY ORIFICE  
FIGURE SW17-SHEET 1

#1	November, 2014
#2	June, 2016
REVISION #	DATE





LIFT HANDLE

MAXIMUM OPENING OF GATE

FRONT

SIDE

**NOTE:**  
 ALL CONSTRUCTION AND MATERIALS SHALL MEET THE CITY OF OTHELLO'S DESIGN STANDARDS AND BE APPROVED BY THE CITY.

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\SW-STANDARD DETAILS\SW18-SH 1

<b>CITY OF OTHELLO</b> STANDARD DETAILS SHEAR GATE FIGURE SW18-SHEET 1		#1 #2	November, 2014 June, 2016	
REVISION #	DATE			

# SECTION 9

## 1. NON-POTABLE WATER STANDARDS

### 9.01 General

The standard established by this chapter are intended to represent the minimum standards for the design and construction of non-potable water distribution systems, service lines, and irrigation systems supplied by the City of Othello. Greater or lesser requirements may be mandated by the City due to localized conditions and/or calculated requirements. Extensions, connections or modifications to the existing system shall be in compliance with state and federal standards.

It is the intent of the City of Othello to have all practical lands within the city limits connected to the non-potable water system. Main line extensions and/or additional source improvements may be required to provide service to developments. Approvals of final plat approval and structure occupancy permits may be impacted by the developer and/or landowner not complying with these standards.

### 9.02 Non-Potable Water

City of Othello's non-potable water is defined as water that is not treated to approved drinking water standards and is not suitable, nor intended for human consumption (to include drinking, bathing, showering, cooking, dishwashing, or maintaining oral hygiene), but is produced and delivered to users for irrigation, commercial and industrial uses. Non-potable water may include treated industrial wastewater (reclaimed water), raw (untreated) groundwater, and raw (untreated) surface water.

A. Authorized Uses: Non-potable water is authorized for:

- Landscape irrigation of areas accessible to the public including, but not limited to, parks, greenbelts, golf courses and common areas at residential building developments (townhouses, condominiums, and apartments), commercial/ business parks, and other similar complexes
- Resident-controlled landscape irrigation
- Non-residential controlled landscape irrigation at single family homes (i.e. Homeowners Associations).
- Agricultural irrigation including non-food crop and silviculture.
- Potential industrial uses: industrial processes, wash water applications, and non-discharging construction and road maintenance activities.
- Other uses as approved on a case-by-case basis by Othello Public Works Director.

B. Non-Authorized Uses: Non-potable water is not authorized for:

- Fire protection
- Potable uses
- Other uses not specifically approved by the City of Othello.

C. All irrigation systems for landscaped areas adjacent to the existing or future recycled non-potable water alignment shall be designed and installed to allow for the current and future use of non-potable water. The Owner/Developer shall be responsible for all costs incurred in designing and installing the pressure irrigation systems.

### **9.03 Design Standards**

The intent of these design standards is to ensure dependable pressurized distribution systems of the non-potable water. Pressurized systems must be a reliable source for residential irrigation systems in particular to discourage cross connections between pressure irrigation and domestic water systems.

All lands with potable and non-potable water availability shall install cross connection control device on the potable water system per Chapter 6 of these standards.

A. Detailed plans shall be submitted for the City's review which provides the locations, size and type of the proposed non-potable water system and points of proposed connection. These plans shall be separate from other utility plans.

B. Project plans shall have a horizontal scale of 20 feet to the inch and a vertical scale of not more than 5 feet to the inch. Plans shall show:

1. Locations of streets, rights-of-way, and existing utilities.
2. Ground surface, pipe type and size, and valves stationing.
3. All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly sewer lines, water mains and side services, gas mains, storm drains, overhead and underground power and all underground structures, telephone lines and television cables.
4. All easements (utility, irrigation, and other) and applicable County recording number.

C. All irrigation systems installed shall be designed and constructed for long term operation and low maintenance. Systems shall be designed and constructed to meet or exceed the minimum system design criteria and standards adopted herein by the City.

D. Hydraulic design criteria of a pressure distribution system:

- a. Designers should contact the City of Othello Public Works to determine the pressure and flow available at their specific point. The source and distribution system shall be designed to meet the requirements of the entity that will own

the pressure system. In general, this criteria state that the source and distribution piping shall be sized for normal operating pressures of 35 to 60 PSI. Piping and pumping facilities should be sized so that under peak flow conditions the most critical service would receive 15 GPM at a minimum pressure of 35 PSI.

- b. Headloss: Design velocity of the main line shall not exceed 8 feet per second.
- c. Mainline distribution piping shall be minimum 4 inches in diameter. Computations and other data used for design of the non-potable water system shall be submitted to the City for approval. Computations and other data used for design of the non-potable water system may be required for City approval. Hydraulic design may include, but is not limited to, main line installations, side service laterals, pumps, and controls.
- d. Mainline Pipe Cover and Crossing Clearance: pipes shall be buried at 24 inches below the final grade surface and have a minimum pipe crossing clearance with other utilities of 1 foot. Where the minimum clearance cannot be met, encasement or cap shall be designed by the design engineer for approval by the City's Engineer.
- e. Air Relief and Blow-off Valves: Provide appropriate air relief valves (pressure air release at all high points to vent; air and vacuum to vent air while filling and to allow air to re-enter while draining to prevent collapse, etc.) at all high points in the pipe line.
- f. Separation Requirements: All non-potable water service lateral and meters must be at least 10 feet from the nearest potable water facility, including pipelines, meters and hydrants. Designers should check to see that laterals and meters that serve their site meet these requirements.
- g. Backflow Prevention: Since non-potable water is not used for drinking purposes, backflow protection is not normally necessary on non-potable water systems. However, Public Works may require backflow protection on the proposed system if it is determined that there is a backflow hazard on-site which threatens the integrity of the distribution system.  
Backflow devices are required as part of a potable water service connection to sites where non-potable water is available. At premises where both non-potable water and potable water are presents in separate piping systems with no interconnecting, a reduced pressure (RP) principal backflow prevention device must be located as close as practicable to the downstream side of every potable water meter.
- h. Hose Bibs are not allowed on non-potable water systems.

- i. Each system shall be protected from mainline winterization activities via an isolation valve or designed as such to handle mainline draining activities.
- E. All non-potable water system transmission and distribution piping spanning channels, highways, railroads, and other physical barriers shall be contained in in casings.
- F. The submission of the final plat shall include a complete set of O&M's for the system (if applicable).
- G. Documentation of the design of the non-potable water system distribution within any right-of-way, or proposed city right-of-way, shall be with plans signed by a Professional Engineer.
- H. The system shall be provided with a drain(s) or blow-off to provide for winterization. Blow-off valves can also be used to provide a means to provide for removing water from the system for winter time freeze protection.
- I. Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WPCF, and APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints.
- J. Except as otherwise noted herein, all work shall be accomplished as recommended in applicable American Water Works Association (AWWA) Standards, and according to the recommendations of the manufacturer of the material or equipment concerned.
- K. The location of mains, valves, hydrants, and principal fittings including modifications within the proposed ROW shall be staked by the Developer. No deviation shall be made from the required line or grade. The Contractor shall verify and protect all underground and surface utilities encountered during the progress of this work.
- L. Irrigation systems must be designed and operated to minimize overspray, runoff and ponding. Designers must specify appropriate irrigation devices to prevent overspray in narrow areas. In the event that, during the coverage test, noticeable overspray, runoff and/or ponding is observed, facilities will be required to be adjusted, removed or relocated as needed.
- M. Prior to final inspection, all pipelines shall be tested.
- N. Before acceptance of the system by the City, all pipes, assemblies, and other appurtenances shall be cleaned of all debris and foreign material. After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.

- O. The Developer shall be required, upon completion of the work and prior to acceptance by the City, to furnish the City with a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and he shall make all necessary repairs during that period at their own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors and suppliers of material or equipment where such warranties are required and shall deliver copies to the City upon completion of the work.

#### **9.04 General Requirements**

- A. Procedures for obtaining a non-potable water service are listed in Appendix A.
- B. Work shall be performed only by contractors experienced in laying public pressure mains.
- C. The Contractor shall obtain approval of materials to be used from the City's Public Works Director prior to ordering of materials.
- D. Mains shall be laid only in dedicated streets or in easements which have been granted to the City. A street is normally not considered dedicated until the plat which created it has been officially filed with the County Auditor.
- E. Mains shall be extended to the far property line(s) of the property being served. Off-site extensions may be required to hydraulically loop existing and new systems.
- F. The City may require mains to be oversized to handle future flows consistent with planning documents. Oversizing of mains and extending utilities to the far property lines shall be the responsibility of the developer.
- G. Distribution isolation valves shall be provided. The general criteria are that a valve is required on two legs of a tee, and three legs of a cross. Valves shall also be provided to isolate non-potable water sources from the distribution system. Valves shall be located so as not to be buried, covered, or otherwise "lost" by normal improvements made to residential lots.
- H. Mains on cul-de-sacs shall be looped, and have a 2-inch blow off assembly installed at the high point.
- I. All materials shall be new and undamaged.
- J. All fittings shall be cement-lined ductile iron.
- K. Provide bends in field to suit construction and in accordance with pipe manufacturer's recommendations so as not to exceed allowable deflection at pipe joints.

- L. Provide thrust restraint at all fittings and bends in accordance with the City standards and conditions. Blocking to be designed by Design Engineer.
- M. Provide anchor blocking at all up-thrust vertical bends in accordance with City standards. Thrust blocking to be designed by Design Engineer.
- N. All services shall end within road rights-of-way or easements, except when otherwise approved by the Public Works Director.
- O. Road restoration shall be per City, County or State design and construction standards, as may be applicable. Developer and Contractor shall become familiar with all State, County and City conditions of required permits, and shall adhere to all conditions and requirements.

**9.05 Materials & Inspection**

In general, the materials included herein shall meet the requirements outlined in Section 6: Water System Standards, unless specifically stated otherwise in this section.

A. Inspections:

The Contractor shall request for inspection a minimum of 48 hours in writing prior to the Contractor’s scheduled need. Inspections shall be required for the following items of work:

- 1. Pipe and bedding installation
- 2. Backfill and compaction
- 3. Thrust Restraint and thrust block placement
- 4. Pressure testing.

B. Non-Potable Mains and Fittings.

- 1. Unless otherwise approved or required by the Public Works Director, the main shall be C900 or C905 PVC (purple pipe) as shown below. The minimum size for all main lines shall be 4 inches, unless specifically written approved stating otherwise.

<u>Pipe Diameter</u>	<u>Class</u>	
	<u>D.I.</u>	<u>PVC</u>
4" through 6"		Class 150
8" through 14"	Class 52	Class 150
16" and larger	Class 50	Class 150

- 2. Restrained joint pipe, where shown on the plans shall be push-on joint type with “Fast Tight” gaskets as furnished by U.S. Pipe or equal for equal for 12” diameter and smaller pipe and “TR FLEX” as furnished by U.S. Pipe or equal pipe larger than 16”. Due to the shallow installation of the mainline piping, the thrust restraint and blocking are non-typical – refer to TABLE 1 below.

TABLE 1: Thrust Restraint Using Restrained Joint Pipe, Fittings and Valves:

- a. Restrained lengths specified in the table that follows are minimums. Actual restrained joint thrust restraint shall be sized/selected by the joint restraint manufacturer for each specific installation to meet the design criteria. In no case shall restrained length be less than lengths specified in the table that follows. If requested by the Owner, Contractor shall provide calculations justifying sizing, as well as installation instructions, and configuration recommendation.
- b. Restrained joint thrust restraint shall meet the following design criteria: 120 psi test pressure, Minimum Safety Factor or 2.0 (at test pressure), soil condition ML (silt), Trench Type 3, and bury depth of 2.0 feet.
- c. In the event field conditions (soil, or other) vary from criteria herein, Contractor shall notify the Engineer and shall provide manufacturer's recommendations for conditions observed.
- d. Thrust restraint for fitting, appurtenances, or joints not shown on the drawings but installed by the Contractor shall be in accordance with requirements herein.
- e. All fittings with valves bolted directly to them shall use the minimum restrained length in the column titled "Dead ends, inline valves" from the table that follows. Reduced restrained lengths may be applicable on a case by case basis; Contractor may submit calculations justifying reduced restrained length for Owner's consideration.

PIPE DIA.	MINIMUM RESTRAINED LENGTH IN FEET <sup>(1)(2)(3)</sup>			
	90° BENDS, TEES <sup>(4)</sup>	45° BENDS <sup>(4)</sup>	22.5°/11.25° BENDS <sup>(4)</sup>	DEAD ENDS, IN-LINE VALVES
4"	34	14	7	83
6"	47	20	10	115
8"	61	25	12	150
10"	71	30	15	179
12"	83	35	17	209

1. *Table values based on EBAA Iron Restraint Length Calculator with the following assumptions: PVC pipe material, soil type ML (silt), safety factor of 2.0, trench type 3, bury depth of 2.0 feet, and test pressure of 120 psi.*
  2. *Assumes PVC pipe material; table values will be conservative for DI pipe.*
  3. *For test pressures other than 120 psi contact Othello Public Works Department for direction on joint restraint requirements.*
  4. *The values in the table are for horizontal bends only; vertical bends shall be calculated on a case by case basis.*
3. All non-potable water piping, valves, outlets and fixtures and other appurtenances shall be color coded in conformance with the National Industrial Color Code (purple). Marking tape SheildTec by Empire or approved equal.
  4. All non-potable water controllers, valves, outlets, etc. shall be tagged or signed with the following words: "NON-POTABLE WATER – DO NOT DRINK" or similar.

5. Blowoffs and drain valves should be painted purple and labeled “NON-POTABLE WATER – DO NOT DRINK” or similar.

#### **C. PEX Reclaimed Water Tubing and Fittings.**

1. Unless otherwise approved or required by the Public Works Director, non-potable lines 2” and smaller shall be crosslinked polyethylene PEX-a Engel method; PEX 5106 “AquaPEX” Reclaimed Water Tubing by Uponor or approved equal.
2. Fittings shall be cold expansion fittings for PEX-a tubing and/or compression type and recommended by the piping manufacture recommendations. Insert stiffeners shall be used for compression type couplings and connections.
3. Whenever possible, tubing should be “snaked” back and forth within the trench to provide adequate stability against anticipated temperature fluctuations.

#### **D. Combination Air Valve Assemblies**

2-inch air and vacuum release valves shall be installed at principal high points in the system in accordance with the Standard Detail. The installation of these items shall include connection piping, gate valve, valve box, and all accessories.

The combination air valve shall be a ARI D-040 LP combination valve with both an air release valve and an air and vacuum valve. The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system which it is full and operating under pressure. The air and vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

#### **E. Air Valve Box**

The Combination Air Valve Assembly shall be installed in a concrete Brooks 2424CB with traffic rated bolt-down solid steel cover or preapproved equal. Box shall be installed in such a manner that minimizes water runoff infiltration and installed onto 4 – 6 inches of free draining compacted gravel.

### **9.06 Water Pipe Testing**

The contractor shall request a meeting 24 – 48 hours prior to any pipe testing to discuss the proposed methods of testing and expected timelines.

All main lines shall be cleaned and hydrostatically tested per current applicable AWWA and WSDOT/APWA Standards prior to acceptance of the Work. A water hydrant meter shall be required and procured from the City for all water utilized for flushing pipelines. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and

measuring equipment necessary for performing the test shall be furnished, installed and operated by the Contractor.

The main line shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be placed and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking. Main line testing may be completed with the side service corp stop closed.

As soon as pipe is secured against movement under pressure, it may be filled with water. Satisfactory performance of air valves shall be checked while the line is filling. The remaining elements of Chapter 6 testing requirements may be followed for PVC main line testing.

Service lines 50 feet and less shall be pressurized to 1.5 times the working pressure and visually inspected for leaks.

PEX main line and service line filling and testing:

The pipe should be filled slowly, limiting the flow to low velocities that prevent surges and air entrapment. Valves at high points should be open to allow air to escape as the water level increases inside the pipe. To prevent damage to down-stream valves, the piping should be thoroughly flushed prior to testing. Visually confirm all connections are properly made per manufacturer's installation guidelines.

1. Ensure that all components, fixture and equipment not rated for the test pressure are isolated from the test system.
2. Ensure that all other thermoplastic piping materials are isolated from the test system.
3. Fill the system slowly with potable water, limiting the flow to low velocities that prevent surges and air entrapment.
4. Condition the system at 1.5 times the required test pressure for 30 minutes. This will require constant pumping or cycling the valve and compressor to maintain a pressure of 1.5 times the test pressure. If cycling the valve and compressor, apply additional pressure once the psi has dropped 10 lbs.
5. After conditioning the system for 30 minutes, quickly relieve excess pressure by opening the valve. Close the valve when the system has reached the desired test pressure. PEX shall be tested at a pressure of 80 psi.
6. Once the valve is closed, confirm a slight rise in pressure (3 to 6 psi). This will occur since the pipe's internal diameter (ID) is shrinking from its conditioned state to equalize at the lower pressure.

7. Visually check for leakage and monitor the pressure for the duration specified by local code. (A typical pressure test can range from 2 to 24 hours).
8. If there is no reduction in pressure, the system is regarded as leak tight. **Note:** Slight fluctuations of pressure are normal due to ambient temperature changes, especially during long durations (e.g., 24 hours).

### **9.07 Staking**

All surveying and staking shall be performed by an engineering or surveying firm employed by the Developer and capable of performing such work. The engineer or surveyor directing and/or performing such work shall be currently licensed by the State of Washington to perform said tasks. A preconstruction meeting shall be held with the City prior to commencing staking and notification will be given to the City that the staking is complete prior to beginning construction for their review. The minimum staking of water systems shall be as follows:

- A. Provide staking sufficient to satisfy Public Works Director. In new plat development, roadway centerline staking must be readily identifiable.
- B. Stake locations of all proposed blow-off, air-vac, valves, etc.

### **9.08 Trench Excavation**

- E. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.
- F. Trenches shall be excavated to the line and depth designated by the City to provide a minimum of 24 inches of cover over the pipe. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency and in compliance with all safety requirements of the prevailing agencies. See Detail. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The Contractor shall maintain sufficient pumping equipment on the job to ensure that these provisions are carried out.
- G. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth six inches below the pipeline grade. Where materials are removed from below the pipeline grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

- H. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City, and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.
- I. The bedding course shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

### **9.09 Backfilling**

Native material for backfill: Material must be free of wood waste, debris, clods or rocks greater than three inches in any dimension. Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected material shall be placed and compacted around and under the pipe by hand tools. Special precautions should be provided to protect the pipe to a point 12 inches above the crown of the pipe. The remaining backfill shall be compacted to 95 percent of the maximum density in traveled areas and road prisms, 95 percent outside driveway, roadways, road prism, shoulders, parking or other traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. Typically, all trenches located in roadway sections, roadway "prisms", and in traffic bearing areas shall be required to be backfilled and compacted with crushed surfacing top course. Due to local conditions, as may be specifically approved by the City, suitable excavated backfill material, as determined by the City, may be utilized as backfill, or if such material is not available from trenching operations, the City may order the placing of gravel base conforming with Section 9-03.10 of the WSDOT Standard Specifications for backfilling the trench. All excess material shall be promptly loaded and hauled to waste.

### **9.10 Street Patching and Restoration**

See Chapter 5 of Public Works Design Standards for requirements regarding street patching.

### **9.11 Erosion Control**

The detrimental effects of erosion and sedimentation shall be minimized by conforming to the following general principles:

1. Soil shall be exposed for the shortest possible time.
2. Reducing the velocity and controlling the flow of runoff.
3. Detaining runoff on the site to trap sediment.
4. Releasing runoff safely to downstream areas.

In applying these principles, the Developer and/or Contractor shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop

materials; providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible.

**C. Trench Mulching**

Where there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, backfill material shall be compacted and held in place by covering the disturbed area with straw and held with a covering of jute matting or wire mesh anchored in place.

**D. Cover-Crop Seeding**

A cover crop shall be sown in all areas excavated or disturbed during construction that were not paved, landscaped and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original or superior condition.

Cover crop seeding shall follow backfilling operations.

The Developer and/or Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be re-seeded if required and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

During winter months, the Contractor may postpone seeding, if conditions are such that the seed will not germinate and grow. The Developer and/or Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown and affords protection from erosion.

The cover crop shall be sown at a rate of 10 to 15 pounds of seed per acre using a hand or power operated mechanical seeder capable of providing a uniform distribution of seed.

**9.12 Finishing and Cleanup**

After all other work on this project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections of a new roadway consistent with the original section, and as hereinafter specified.

On construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that upon completion the area will present a uniform appearance, blending into the contour of the adjacent

properties. All other requirements outlined previously shall be met.

Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished with a grading machine to the required cross section and grade, so long as such means do not damage existing improvements, trees, and shrubs. Machine dressing shall be supplemented by handwork to meet requirements outlined herein, to the satisfaction of the Public Works Director.

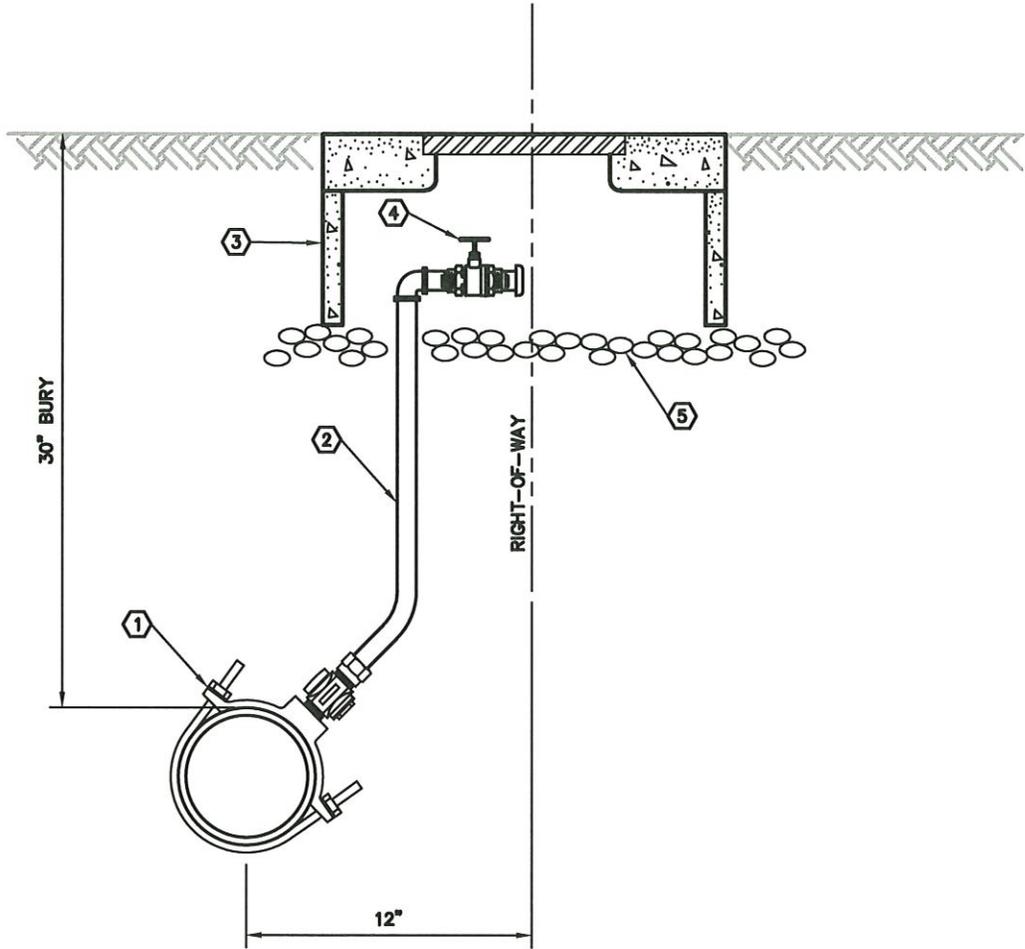
Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade. Where the existing surface is below sidewalk and curb, the area shall be filled and dressed out to the walk. Wherever fill material is required in the planting area, the finished grade shall be elevated to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks greater than 3 inches in diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly to present a uniform, natural, well-sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed to a permitted site capable of handling this material and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer and/or Contractor shall remove and dispose of same and restore said disturbed areas at his own expense.

Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris, which is the result of the Developer and/or Contractor's operations. All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities, which have been sprayed by the asphalt cement, shall be cleaned to the satisfaction of the Public Works Director.

Castings for monuments, water valves, vaults and other similar installations, which have been covered with the asphalt material, shall be cleaned to the satisfaction of the Public Works Director.



**NOTE:**

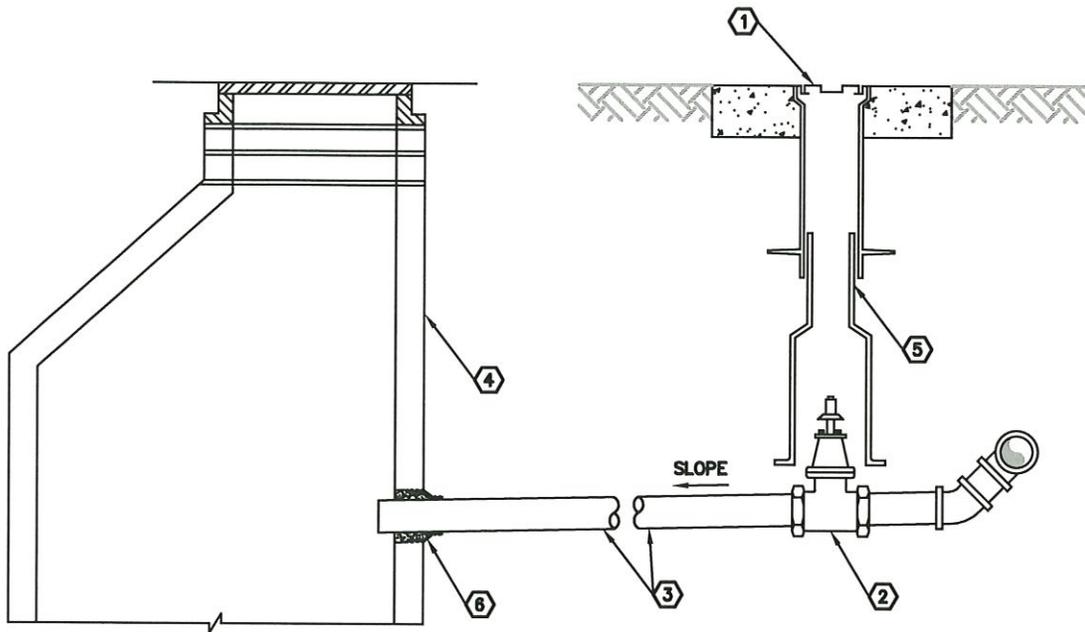
- ① 1" STAINLESS SADDLE TEE
- ② 1" HIGH DENSITY POLYETHYLENE TUBING SDR 9
- ③ 12" FRP BOX, SHALL BE CONCRETE IN TRAVELED WAYS
- ④ 1" BRASS BALL VALVE WITH TEE HANDLE
- ⑤ 4" THICK GRAVEL

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CITY OF OTHELLO  
 STANDARD DETAILS  
 1" STANDARD CONNECTION  
 FIGURE NP1-SHEET 1

#1	July, 2017
REVISION #	DATE





**NOTE:**

- ① CAST IRON COVER MARKED "NON-POT"
- ② 2" GATE VALVE
- ③ 2" CROSS-LINKED POLYETHYLENE (PEX) PRESSURE PIPE
- ④ STORM WATER MANHOLE
- ⑤ VALVE BOX CENTERED OVER OPERATING NUT
- ⑥ KOR-N-SEAL

S:\AUTOCAD DRAWINGS\172 OTHELLO\DESIGN STANDARDS\AUTOCAD STANDARD DRAWINGS\NP-STANDARD DETAILS\NP2-SH 1

CITY OF OTHELLO  
 STANDARD DETAILS  
 2" DISTRIBUTION DRAIN  
 FIGURE NP2-SHEET 1

#1	July, 2017
REVISION #	DATE



**APPENDIX A**

**SECTION C1-9 "SPECIAL REQUIREMENTS"**

**WASHINGTON STATE DEPARTMENT OF ECOLOGY  
"CRITERIA FOR SEWAGE WORKS DESIGN", 2008 EDITION**

**APPENDIX B**

**SAMPLE DOCUMENTS**