DEVELOPER PROJECT MANUAL

CHS ENGINEERS

Available in PDF format at www.bbwsd.com

Revised May 2019

BIRCH BAY

WATER AND SEWER DISTRICT

Birch Bay, Washington

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Revised: May 2019

BIRCH BAY WATER AND SEWER DISTRICT

DEVELOPER PROJECT MANUAL

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BIRCH BAY WATER AND SEWER DISTRICT

DEVELOPER EXTENSION PROCESS

INTRODUCTION

This manual is a guide through the necessary steps to determine whether a developer extension is needed and the steps required to obtain water or sewer service from Birch Bay Water and Sewer District by an extension of the existing water or sanitary sewer system. This manual is available at the District website (www.bbwsd.com).

The process includes submitting an application, signing an agreement for service, preparing and reviewing of plans, submittals to agencies, certification of construction costs and inspection, revising plans to construction, recording of easements, bill of sale and conveyance of facilities, two year warranty, and final acceptance.

REVIEWING REQUEST FOR DEVELOPER EXTENSION

Prior to entering into an agreement with the District, the applicant will complete an application form with attachments and submit with the application review fee ($500, per application). A separate application and agreement are required for water and sewer service. The District will determine if:

1. They will proceed with an agreement and conditions for the extension and service.

2. What fees will be required after the applicant has determined who will design the system extension and/or improvements (the applicant's engineer or the District's consulting engineer).

FEES AND CHARGES

The Developer shall pay connection charges to Birch Bay Water and Sewer District and deposit with Birch Bay Water and Sewer District an estimated amount of money for work to be done by the District and its consultants with regard to the project. Fees to be paid to the District are outlined in the Agreement included in this document.

Developers requiring special provisions in their Agreement or their facilities can expect that the total charges to be billed by the District and/or its consultants will be increased beyond that of a similar development without the special provisions. Additional charges will be incurred by the Developer when additional research, coordination,

documentation or review is required or if variances from District standards are requested.

Some special provisions that cause additional charges to be incurred by the Developer are listed below:

1. latecomer agreements
2. use of pumping systems
3. designs that require modification to the District's standard design practice
4. alternate assessment practice
5. design or construction changes
6. installations not in accordance with plans requiring additional inspections

OUTLINE OF DEVELOPER EXTENSION PROCESS

To initiate the developer extension process, the Developer shall complete the application form contained in this manual and submit it with the application review fee and required attachments to the District. The District will review the information for serviceability and prepare a summary of conditions for the developer extensions and provisions of service.

If the conditions are acceptable to the applicant, the applicant shall submit the first one-half of the Project Deposit to the District. A Developer Extension Agreement shall be prepared (one each for water and sewer extensions) by the District for signature by the Developer, Property Owner (if not the Developer) and the District. The Developer shall then submit plans to the District to be reviewed or can have the District's engineer prepare the plans. After the District approves construction plans and receives necessary approvals from all agencies, the Developer may start construction. A preconstruction conference must be held and all appropriate permits, insurance and bond must be obtained prior to construction. During construction the District will have an inspector present to insure that the system is installed to District standards. As construction progresses to a point that all the pipe is in place, easements covering those portions of the system outside the public right-of-way and the plans revised to as-built construction records shall be prepared to submit to the District. The Developer is responsible for submitting copies of plat approval by Whatcom County to the District. When easements, revised plans, and construction of the system is approved, a Bill of Sale form shall be prepared and executed by the Developer whereby the completed system shall be turned over to the District. The Developer shall provide a bond or a cash deposit warranting the system and the work for two years from the date of acceptance of the system and its conveyance. Prior to the end of the two-year period,

the project shall be inspected and any items needing repair shall be rectified by the Developer before the bond is released.

Please refer to the Developer Extension Checklists in Sections B and C for determining the order of District requirements.

INFORMATION FOR DEVELOPER'S ENGINEER AND CONTRACTOR

The Developer is responsible to inform its consultants, its contractor, and all subcontractors of the District's requirements. We recommend that the Developer and engineer/architect and contractor obtain a copy of this manual.

Contractors working for the Developer shall be licensed and bonded in the State of Washington.

SELECTION OF ENGINEER

The Developer may have his own engineer prepare the construction plans and specifications and have them reviewed by the District's engineer, or it may request the District to have their engineer prepare them.

- <u>If Prepared by District's Engineer</u>

  The District's engineer will prepare construction plans and specifications on a time and expense basis at the request of the Developer.

- <u>If Prepared by Developer's Engineer</u>

  Plans prepared by the Developer's engineer shall be reviewed by the District's engineer to see that they conform to the District's standards. The costs of the District engineer's review of the plans shall be paid by the Developer. Standards for plan preparation are included in this Developer Project Manual.

VARIANCES

Any material deviation or variance from the requirements and standards contained herein shall be reviewed and approved by the District Commissioners. All requests for variances and appeals shall be scheduled through the District General Manager.

PERMITS AND OTHER APPROVALS

Plans of the water or sewer system will be submitted by the District to Whatcom County Department Public Works for review. A Revocable Encroachment Permit is required for work within the County's right-of-way. Plans will be submitted to the State Department of Health (supply, intertie or treatment projects) for review and approval prior to construction. Plans will be submitted to the State Department of Ecology for review and approval prior to construction for sewer trunks, interceptors, pump stations and projects not included in the District's *Comprehensive Sewer Plan*.

All other permits shall be obtained by the Developer as required by law. These could include, but not be limited to, wetlands (local, state and/or federal), diking districts, drainage districts, fishery agencies, highway department, state land agencies, gas or oil pipeline companies, etc. Copies of all permits and/or approvals shall be furnished to the District. All rights shall be granted to or transferred to the District.

SECTION B

DEVELOPER WATER EXTENSION

BIRCH BAY WATER AND SEWER DISTRICT

Whatcom County, Washington

CONDITIONS AND STANDARDS

FOR

DEVELOPER WATER EXTENSIONS

Pursuant to the Municipal Water and Sewer

Facilities Act

(RCW 35.91)

EXTENSION: _____

DEVELOPER: _____

_____

PROPERTY OWNER _____

_____

DATE: _____

BIRCH BAY WATER AND SEWER DISTRICT
WHATCOM COUNTY, WASHINGTON

APPLICATION FOR DEVELOPER EXTENSION
TO WATER SYSTEM

1. The undersigned applies to Birch Bay Water and Sewer District, Birch Bay, Washington, for permission to construct and install an extension of the District's water system located in public rights-of-way under the District's franchise, and/or on easements over private property to connect to the District's water system, all of which are subject to the approval of the District.

2. A check for the $500.00 review fee for this application is attached.

3. The proposed extension will be installed in roads and/or easements and/or on other approved public rights-of-way and shall be for the use and benefit of the property legally described as follows:

   The common street address of the property is _____,

   and the legal description of the property is:_____

   _____

4. (a) Describe the type of improvements planned for the above-described property, i.e., single family residences, other individual residential units or commercial usage, and the proposed number of units.

   _____

   _____

   _____

   (b) Attached to the application shall be two copies of each of the following:

   - A preliminary plan setting forth the proposed development.

     The plan shall include property boundary lines, indication of type of development, location of roads, building and/or other important features, type of building construction, and the number of units shall be stated.

   - A final or preliminary plat map or property map of the property to be developed.

- A contour map of the area with a five foot contour interval or less. Datum shall be based on the most recent U.S.C.G.S. with benchmark locations shown.

- Existing and proposed roadway profiles.

5. Set forth the proposed date for construction of the project and the anticipated completion date for the project:

   Start of Construction:_____

   Completion Construction:_____

6. Set forth common street address and telephone number of Developer and Property Owner:

   Developer:_____

   Property Owner:_____

7. (a) Have you made an application to Whatcom County or any other municipality having jurisdiction of the project for a building permit or for approval of a plat, a short plat, a rezone or a planned unit development? If yes, list the name of the agency or agencies and type of action requested.

Name of Agencies	Type of Action	Dates Applied

   (b) Have you prepared an environmental checklist, negative declaration of EIS?

   Yes _____ No _____

   If yes, list name of lead agency:

   _____

   Date of application:_____

   If an EIS, negative declaration or checklist has been completed, attach a copy.

8. The Developer Project Manual includes a Developer Extension checklist. Please advise if there are any items on the checklist with which you have a question or you cannot comply.

_____

_____

_____

9. Do you want the District's consultants to prepare the plan for the proposed project?

Yes _____ No _____

Prepared by: _____
Date: _____

Developer: _____
Telephone No.: _____

Property Owner: _____
Telephone No.: _____

Engineer: _____
Address: _____
Telephone No.: _____

Architect: _____
Address: _____
Telephone No.: _____

Contact Person: _____
Address: _____
Telephone No.: _____

REVIEW OF APPLICATION

DEVELOPER WATER EXTENSION

1. Have all the questions in the application been adequately addressed?

   Yes _____ No _____

   Comments:_____
   _____

2. Upon the submission of the preliminary plan to the District, the District's Engineer and General Manager will set forth the water capacity necessary for the contemplated improvement. Does the anticipated water flow exceed the capacity of the contemplated improvement and/or system?

   Yes _____ No _____

3. Is a latecomer's charge, connection charge, or other charges against the real property subject to the developer extension?

   Yes _____ No _____

4. Is the project located in the District Retail Service Area?

   Yes _____ No _____

5. Is the project in an annexed area?

   Yes _____ No _____

   If no, has the Owner requested the District to initiate the annexation process?

   Yes _____ No _____

6. Is the project located in the City of Blaine's Urban Growth Area?

   Yes _____ No _____

   If yes, has the property owner executed a no-protest annexation agreement with the City?

   Yes ___ No _____

7. Does this project require an amendment to the District's comprehensive plan?

   Yes _____ No _____

8. Has schematic design been reviewed with District Staff for configuration, vehicular access, operation, other issues?

   Yes _____ No _____

9. Does this proposal conform to the District's design standards?

   Yes _____ No _____

   If no, have variances requiring District approval been reviewed and approved by District Staff?

10. District has reviewed application.

    Comments:_____

    _____

    _____

Prepared by:_____

Accepted by:_____

Rejected by:_____

AUTHORIZATION LETTER

RE:

Dear Developer:

This letter shall acknowledge receipt of your deposit in the amount of $_____ for a developer extension agreement by the Birch Bay Water and Sewer District. Your deposit has been provided for the development known as:

By your signature at the bottom of this letter, you shall, on behalf of the developer and this development, authorize the District to expend such monies as may be necessary for preliminary engineering and legal fees for this developer extension. You, on behalf of the developer, further acknowledge and authorize the District to satisfy such obligations with the deposit herein provided, prior to execution of the developer extension agreement.

Very truly yours,

General Manager
Birch Bay Water and Sewer District

Read and Approved:

_____
Developer or Property Owner

After Recording Please Return To:
Attn:
Birch Bay Water and Sewer District
7096 Point Whitehorn Road
Birch Bay, Washington 98230-9675
(360) 371-7100

Document Title(s): Developer Extension Agreement

Reference Number(s) of Documents Assigned or Released: N/A
[ ] Additional on page _____ of document.

Grantor(s): (Print Last name, First name, and Initials)
1._____
2._____
3._____
[ ] Additional on page _____ of document.

Grantee(s): Birch Bay Water and Sewer District

Legal Description (abbreviated: i.e. lot, block, plat of section, township, range):
_____.
[X] Additional legal description is on page two of document.

Assessor's Property Tax Parcel / Account Number:_____
[ ] Additional Parcel Numbers for additional legals are on page ___ of document.

BIRCH BAY WATER AND SEWER DISTRICT
Whatcom County, Washington

DEVELOPER EXTENSION AGREEMENT

WATER

This Developer Extension Agreement ("Agreement") is entered this _____ day of _____, _____, by and between _____("Developer") and _____("Owner"), together referred to as "Developer/Owner", and the Birch Bay Water and Sewer District in Whatcom County, Washington (hereinafter the "District"). By signing this Agreement, Developer hereby requests permission from the District to construct and install an extension in the public right-of-way under the District's franchise therefore, and/or on easements which are subject to the approval of the District.

1. LOCATION AND EXTENSION

The proposed extension will be installed in roads and/or easements and/or on other approved rights-of-way and shall be for the use and benefit of the property hereinafter legally described as follows:

Legal Description of Property:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The above described property is hereafter referred to as the "Property."

2. DESCRIPTION OF EXTENSION AND OWNERSHIP

The proposed extension will consist of approximately _____ lineal feet of water main and appurtenances (hereafter "Project" or "Project extension"), and shall be installed in accordance with plans and specifications approved by the District, in accordance with the standards and conditions for constructing extensions to the water system adopted by the Board of Commissioners of the District, and the conditions approved by the Board of Commissioners of the District for service to the Property per the developer extension application review process, the terms and conditions of which are attached hereto and made a part hereof.

The Owner represents, guarantees and warrants that he/she/it is the owner of the Property.

3. FEES AND CHARGES

A. A review fee, which is paid to the Washington State Department of Health (DOH), shall be paid by the Developer/Owner to the District for projects involving source of supply, intertie or treatment facilities. This fee is determined by DOH at the time of plan submittal.

B. Unless otherwise agreed herein, all costs incurred by the District on this Project shall be borne by the Developer/Owner. The Developer/Owner shall deposit a fee (the Project Deposit) which shall be determined by the District after review of application. The fee shall be payment for all costs to be incurred by the District for inspection, engineering, legal, financial or any other services performed by or for the District relating to this Project. Developer/Owner shall pay the District for staff hourly wages and benefits for work performed by District staff on the Project, plus an overhead fee. The overhead fee shall be calculated pursuant to District Code Section 2.24.010 and is subject to change without notice during the term of this Agreement. An administrative overhead fee of five percent (5%) shall be added to all fees charged by outside professional or other services. The Developer/Owner shall be responsible for the payment of all such costs incurred by the District prior to Final Acceptance by the District and for two years thereafter. The meaning of the term “final acceptance” as used in this Agreement is set forth in Section 15 herein.

C. The fee is retained for two years after Final Acceptance, at which time any remaining unexpended fee will be returned to the Developer/Owner.

Water General Facilities Charge - The Developer/Owner shall pay the District’s General Facilities Charge for water service facilities in the amount currently established at District Code Section 7.04.081 for each equivalent living unit (ELU) to be located on the Property, as defined at District Code Section 7.04.010 and any amendments thereto. The Developer/Owner shall not be subject to increases in the General Facilities Charge until the expiration of the two (2) year term of this Agreement or until completion and acceptance of the Project, whichever occurs first.

Should the General Facilities Charge be increased, before or after completion and acceptance of the Project, but prior to actual connection to the system and commencement of monthly service payments to the District, the property owner at the time of connection to the system shall be subject to such increased General Facilities Charge and shall pay the difference to the District between the General Facilities Charge previously paid to the District and the General Facilities Charge currently in effect at the time of connection. This sum shall be paid prior to the District providing service.

The General Facilities Charge reimburses the District for a pro rata share of the cost of the general system required to furnish District-wide service. Such system consists of both existing facilities constructed and future facilities to be constructed as identified in adopted District plans. Payment

of the General Facilities Charge does not guarantee availability of water at the time connection to the system is requested.

The District will allow a credit against the General Facilities charge to any Developer/Owner who is required to install General Facilities. Such credits include but are not limited to the difference between the cost of eight inch (8") diameter lines and any such larger lines that the District may require the Developer/Owner to install.

Payment of one-half (1/2) of the total General Facilities Charges due for the Project shall be made by Developer/Owner before Project construction begins.

Payment of the remaining one-half (1/2) of the total General Facilities Charges due for the Project shall be made by Developer/Owner prior to the District's final acceptance of the Project.

D. Regional Connection Charge. The Developer/Owner shall pay the District's Regional Connection Charge for water service facilities in the amount established at District Code Section 7.04.080 for each equivalent living unit (ELU) to be located on the Property, as defined at District Code Section 7.04.010 and any amendments thereto. The Regional Connection Charge shall be due for any new connection or increase in ELUs beginning January 1, 2009, in the amount per ELU specified in District Code Section 7.04.080 as of the date of Final Acceptance of the Project, regardless of the date application was made or the date this Agreement is entered. In approved instances, where previously agreed in writing, the District may allow a Developer/Owner to construct, improve, or enhance general facilities of the District, for which a credit against general facilities charges may be recognized. Such a credit may not be applied against the Regional Connection Charge. The Regional Connection Charge must be paid and shall not be eligible for any credit for work done to construct, improve or enhance general facilities of the District.

Payment of one-half (1/2) of the total Regional Connection Charge due for the Project shall be made by Developer/Owner before Project construction begins.

Payment of the remaining one-half (1/2) of the total Regional Connection Charge due for the Project shall be made by Developer/Owner prior to the District's final acceptance of the Project.

E. Prior to the commencement of Project construction, the District may, at its sole discretion, require the Developer/Owner to submit for District approval, a Project Estimate (Exhibit A hereto) identifying the estimated cost and funding source for each Project element. If applicable, the Project Estimate shall specify which Project elements are General Facilities and which Project elements are to be subject to the Reimbursement Agreement herein. The parties recognize that the actual costs of construction may vary from the Project Estimate and that the Project Estimate is to be used as a guide for development of the Reimbursement Agreement herein and determination of fees and charges during Final Acceptance.

4. PAYMENT - SECURITY OF FEES

The Project Deposit identified in Item 3.B. above shall be paid by the Developer/Owner to the District as follows:

A. One-half (1/2) of the fee at the time this Agreement is made.

B. Second one-half (1/2) of the fee shall be paid before Project construction begins.

C. Any other fees or charges incurred by the District for the Project that are not covered by the Project Deposit and not otherwise described herein, shall be paid in full prior to final acceptance of the Project by the District.

5. PRELIMINARY ENGINEERING

A. The Developer/Owner may have his own professional engineer prepare plans and specifications for water mains or the Developer/Owner may have the District's engineer prepare said plans and specifications.

B. The Developer/Owner shall furnish two (2) copies of the proposed plat map to a scale of 1 inch = 100 feet or 1 inch = 50 feet with contour intervals of 5 feet or less, and proposed road profile sheets prior to the District's ordering of engineering design or plan review from its engineer. Final plat map shall be furnished as soon as possible. The Developer/Owner shall also provide the description, location and elevation of all bench mark data available on the project site and this information, wherever possible, shall be indicated on the maps furnished by the Developer/Owner. The datum used shall be the District's and not an assumed datum.

C. The District recommends pump station and pump system plans and specifications be prepared by the District.

6. DESIGN AND CONSTRUCTION

A. The design and construction of the water mains shall be subject to standards of design and construction set forth in the District’s "Developer Project Manual" and other related standards, as interpreted by the District.

B. The Developer/Owner acknowledges receipt of the District's "Developer Project Manual," the contents of which are hereby incorporated as part of this agreement.

C. The District reserves the right to update the design and construction standards set forth in its “Developer Project Manual” at any time and to require changes in Developer/Owner’s plans before or after their approval. The Project shall also comply with Washington State Department of Health and Washington State Department of Ecology design standards and requirements.

D. The District Engineer retains exclusive and sole authority to determine when the Developer/Owner’s Engineer complies with the design and

construction standards set forth in the District's "Developer Project Manual." The District Engineer is the final design approval authority and the Developer/Owner shall not commence construction until the District Engineer approves the design and the Developer/Owner receives a notice to proceed. It is the Developer/Owner's responsibility to ensure that the plans prepared by his or her engineer conform in all respects to District standards. Any failure by the District to discover errors, omissions, or discrepancies in the plans shall not relieve the Developer/Owner of this responsibility.

E. The District will make available to the Developer/Owner information it knowingly has in its possession regarding existing utilities and obstructions. Such information, however, is not guaranteed to be complete or accurate. Developer/Owner is responsible for conducting his or her own independent investigation and review of nearby existing utilities and potential obstructions. Developer/Owner agrees that the provision of incomplete or erroneous information by the District shall not be the cause of liability against the District or its consultants, nor shall it relieve the Developer of responsibility for reporting any damage its activities may cause to other utilities.

7. EVIDENCE OF INSURANCE

See Section 15 of the General Conditions (Section 00700 of the Developer Project Manual) for insurance requirements.

8. BONDS

A. PERFORMANCE BOND. Prior to the beginning of Project construction, the Developer/Owner or the Developer/Owner's contractor shall provide to the District, at the Developer/Owner's expense, a performance bond in penal sum equal to the cost of all labor, materials and equipment, including Washington State sales tax, necessary to complete the work within the public right-of-way, conditioned upon the performance by the Developer/Owner of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon the prompt payment by the Developer/Owner to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. See Section 16 of the General Conditions (Section 00700 of the Developer Project Manual) for further information on performance bond requirements. The bond shall be in a form acceptable to the District.

B. MAINTENANCE BOND. In addition to the performance bond required by paragraph 8A herein, the Developer/Owner shall provide a maintenance bond in an amount equal to fifteen percent (15%) of the cost of the Project, but in no event less than two thousand dollars ($2,000.00). The maintenance bond shall guarantee that the water system transferred to the District by bill of sale shall remain free of defects and in proper working order for a period of two (2) years from the date of final acceptance of the Project improvements by the District and shall be in a form acceptable to the District.

C. The District may accept a refundable cash deposit, assignment of savings or irrevocable letter of credit in lieu of the performance bond and/or

maintenance bond, so long as the operative terms and conditions of the deposit, assignment of savings or irrevocable letter of credit are the same as those for performance and/or maintenance bonds as provided in paragraphs 8A and 8B and Section 16 of the General Conditions. The assignment of savings or irrevocable letter of credit shall be with a U.S. based financial institution and said account shall be insured by the Federal Deposit Insurance Corporation ("FDIC") for up to Two Hundred Fifty Thousand Dollars ($250,000.00). The assignment of savings or irrevocable letter of credit shall be in a form acceptable to the District. The District shall release the bond, assignment of savings, refundable cash deposit or irrevocable letter of credit, as appropriate, on satisfactory completion of the construction contract or completion of the warranty period and satisfaction of all obligations thereof.

9 SPECIAL CONDITION AND INDEMNFICATION

This Agreement is conditioned upon Whatcom County's determination, and the determination of any authorized body reviewing Whatcom County's determination, that the provision of water and/or sewer service pursuant to this Project complies with the Washington State Growth Management Act, Chapter 36.70A RCW. The Developer/Owner agrees to indemnify and hold harmless the District from any and all claims, suits, actions, or administrative proceedings, and any liability, loss or damage of any kind or nature, including legal defense costs and fees, based upon any such actual or alleged violation.

10. EASEMENTS

The Developer/Owner shall provide the District with all required easements at its sole cost, regardless of any changes to Project design, together with evidence of title, all subject to approval of the District. The easement legal description shall be prepared by a licensed professional surveyor and shall bear his seal. The District Engineer will place the easement on the proper form acceptable for recording with the county auditor, with the District as Grantee, and it will be returned to the Developer/Owner for signature. Where applicable, the Developer/Owner shall provide an easement compatible with the District's Comprehensive Water Plan to insure continuation of the water line. At the completion of Project construction and prior to the District accepting the Project, a final signed easement shall be delivered to the District by the Developer/Owner.

Easements required for intervening properties shall be obtained by the Developer/Owner prior to construction start. All easements shall be granted to the District; plat general dedicated easements are not acceptable.

Developer/Owner shall provide a title insurance policy establishing clear title in grantor of the easement to the District in a sum not less than $1,000.00 per 500 lineal feet of the easement.

11. PERMITS AND COMPLIANCE

All the necessary permits (with the sole exception of the County Revocable Encroachment Permit for work in County right-of-way) shall be obtained by the Developer/Owner. Developer/Owner shall bear sole responsibility for compliance with all local, state and federal laws applicable to Project construction. The

District shall be provided with a copy of all applicable permits before Project construction begins. Construction shall proceed in accordance with all permits, approvals, and other governmental requirements, including without limitation the Whatcom County Development Standards and other District requirements. The District reserves the right to cancel, terminate, suspend, or not renew or extend this Agreement in the event that the Developer/Owner, or the agents thereof, are not in compliance with this Agreement, the District's "Developer's Project Manual," the terms of any permits or approvals, the Whatcom County Development Standards, or any other government requirements.

12. GRADING OF ROADS

Developer/Owner shall grade all roads to the design subgrade elevation prior to the start of Project construction and shall advise the District in writing of any changes which may be contemplated during construction. If the Developer/Owner changes the subgrade elevation of the road after completion of the extension, or any part thereof, the Developer/Owner shall be responsible for all costs incurred for the extension as a result of said change in subgrade elevation. This obligation shall remain in full force until Whatcom County or other municipality releases the right-of-way or road construction bond or bond of other description in connection with the Developer/Owner's obligation for completion of the roads within the area.

13. WATER

The District shall supply flushing water (approximately two fillings of the pipe system) for the Project. Water for excessive flushing or other purposes such as settling and dust control shall be purchased by the Developer/Owner from the District at the current cost established by the District for this purpose.

14. CONNECTION TO THE DISTRICT'S SYSTEM

Not less than 48 hours prior to the time that said Project is partially or fully completed and connection to the District's System is desired, written application for permission to make the actual connection at a specified time shall be made by the Developer/Owner. All new connections to the existing system and all testing of the new line shall require authorization of the District and shall be conducted in the presence of the District's representatives. All inspections, connections, and testing shall be made during normal working hours, unless prior arrangements have been made with the District.

15. BLAINE ANNEXATION AGREEMENT

For property located within the City of Blaine's Urban Growth Area, Developer/Owner shall execute a no-protest annexation agreement with the City of Blaine prior to the District authorizing connection to the existing system.

16. FINAL ACCEPTANCE

The District agrees to accept title to the Project extension, subject to the terms herein, when all work has been completed and when the District has made final inspection and given approval of the system as having been completed in accordance with the plans and specifications. Final acceptance of said Project extension shall be by motion or resolution of the Board of Commissioners;

provided that, if by motion the vote shall be recorded in the minutes of the meeting. The project shall only be eligible for Final Acceptance after District receipt of a completed and executed bill of sale; easements; maintenance bond, cash deposit, assignment of savings or irrevocable letter of credit; and all other documents required pursuant to this Agreement. Payment in full of all fees and charges, and execution of any applicable Reimbursement Agreement, shall also be required prior to Final Acceptance.

Within ninety (90) days following Final Acceptance, the Developer/Owner may elect to connect lots within the Property to the District's system. Connection shall be effected by paying any General Facilities Charges and Regional Connection Charges owing and by commencing and continuing payment of monthly charges for the lot. After ninety (90) days following Final Acceptance, no lot within the Property will be allowed to connect unless such connection occurs in conjunction with a building permit.

17. BILL OF SALE

Developer/Owner agrees to execute a bill of sale approved by the attorney for the District within sixty (60) days of the approved and completed Project extension. Said bill of sale will provide for transfer of title of the constructed Project extension from the Developer/Owner to the District and will further include the following items, statements, and warranties for the benefit of the District:

A. Cost including administration, legal and engineering fees, for the water main installation.

B. The Developer/Owner will warrant (1) that he is the lawful owner of said Project extension and that he has the right to transfer title; (2) that the Project extension is free from all encumbrances; (3) that all bills for labor and material, and all taxes, have been paid, and Developer/Owner has provided a certificate or statement from Developer/Owner's Contractor and Engineer, each acknowledging they have been paid in full; (4) that all laws, regulations, and ordinances pertaining to construction of the Project extension have been complied with; and (5) that there are no lawsuits pending involving the Project. Developer/Owner will agree to hold the District harmless from and to defend all claims and demands made against the District which implicate any of the above warranties for a period of one (1) year from the date of the bill of sale.

C. The Developer/Owner will warrant that the Project extension is in proper working order, condition and repair, and is fit for its intended purpose and has been constructed in accordance with District standards.

D. The Developer/Owner will warrant that for a period of two (2) years from the date of final acceptance of the Project extension, said extension and all parts thereof shall remain in proper working order, condition and repair; and the Developer/Owner shall repair or replace, at Developer/Owner's expense, any work or material which may prove defective during the warranty period.

E. Consideration will be recited that Developer/Owner grants the Project extension to District for the consideration of incorporating the system in the overall water system of the District.

18. REIMBURSEMENT AGREEMENT EXECUTION AND RECORDING

Following completion of Project construction, execution, delivery and receipt of a bill of sale, maintenance bond, necessary easements and all other required documents, and payment in full of all fees and charges, and Final Acceptance of the Project extension by the District, the parties will, only if applicable, enter into a Reimbursement Agreement at the request of the Developer/Owner, in the form and pursuant to the terms set forth in the Reimbursement Agreement form that is attached (only if applicable) as Exhibit "B" to this Agreement. The Developer/Owner shall submit to the District all contracts and costs related to the Project. The District's Engineer will determine the benefit area of the Project and verify the costs eligible for reimbursement. If the District determines that no benefit area per Title 57 RCW exists, then no Reimbursement Agreement will result. The Reimbursement Agreement must be signed and notarized by the Developer/Owner prior to Final Acceptance. The District will record any such Reimbursement Agreement with the county auditor at the Developer/Owner's expense. Requests by the Developer/Owner to establish a Reimbursement Agreement after the District's Final Acceptance will not be considered.

19. RESPONSIBILITY FOR PROJECT MANAGEMENT

The Developer/Owner shall be responsible for project management and coordination. Project management includes but is not limited to overall project coordination, utility and road locations and elevations and conflicts of same.

20. DURATION OF AGREEMENT; LIMITATION OF PERIOD FOR ACCEPTANCE

The Project extension shall be complete and accepted within two years of the date of acceptance of this Application by the District. If the Project extension is not completed and accepted within two years from the date below, this Agreement shall be deemed terminated, unless and until Developer/Owner shall make a new Agreement or District consents to the extension of the existing Agreement and Developer/Owner pays any and all District costs associated with such new or extended Agreement, all as determined by the Board of Commissioners.

21. BREACH OFCONTRACT – ATTORNEY'S FEES

A breach of any provision of this Agreement shall constitute a total breach hereof, and shall subject the Developer/Owner to cancellation of the Agreement, forfeiture of deposits, and a claim for other relieve as allowed by law. In the event of litigation regarding the terms or performance of this Agreement, the substantially prevailing party shall be entitled to an award of reasonable attorney's fees and costs.

22. NO THIRD PARTY RIGHTS CREATED

This Agreement is made entirely for the benefit of the District and the Developer/Owner. No third party shall have any rights hereunder, whether by agency or as a third party beneficiary, or otherwise.

23. COMPLETE AGREEMENT

This Agreement constitutes the entire agreement between the Developer/Owner and the District. This Agreement may be modified in writing only, upon mutual agreement of the parties.

24. JOINT AND SEVERAL LIABILITY

Each and every person or entity party to this Agreement as "Developer" and/or "Owner" shall be jointly and severely liable for performance of the obligations in this Agreement. The District shall have the right to full performance of this Agreement from each and every person identified as "Developer" and/or "Owner" without regard to the respective obligations that such persons or entities may have to each other. The joint and several liability of all persons and entities identified as Developer and/or Owner for performance of the obligations herein is a material part of this agreement.

25. SALE OF PROPERTY PRIOR TO PROJECT COMPLETION

This Agreement shall be binding upon the successors and assigns of the parties and shall run with the land until completion of the project.

Dated this _____ day of _____, _____.

DEVELOPER

_____

BIRCH BAY WATER & SEWER DISTRICT

By _____
Secretary, Board of Commissioners

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

_____
Print Name:_____
NOTARY PUBLIC
My commission expires: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

_____
Print Name:_____
NOTARY PUBLIC
My commission expires: _____

EXHIBIT A

BIRCH BAY WATER AND SEWER DISTRICT

DEVELOPER EXTENSION PROJECT ELEMENTS AND FINANCIAL RESPONSIBILITY

PROJECT ELEMENTS			FINANCIAL RESPONSIBILITY			
			1	2	3	4
	Estimated	% of	General Facilities		Local Facilities	
Description	Project Cost	Project Cost	District	Payback	Developer	Latecomers
Totals	**$0**	**0%**	**$0**	**$0**	**$0**	**$0**

Total District Responsibility- Column 1

Total Payback for General Facilities - Column 2

(initially paid by Developer, credited against GFC due for corresponding system - water or sewer, remainder if any reimbursed per agreement)

Total Developer Responsibility - Column 3

Total Latecomers for Local Facilities - Column 4

(initially paid by Developer, reimbursed per agreement)

After Recording Please Return To:
Attn:
Birch Bay Water and Sewer District
7096 Point Whitehorn Road
Birch Bay, Washington 98230-9675
(360) 371-7100

Document Title(s): Reimbursement Agreement

Reference Number(s) of Documents Assigned or Released: N/A
[ ] Additional on page _____ of document.

Grantor(s): (Print Last name, First name, and Initials)
1._____
2._____
3._____
4._____
5._____
[ ] Additional on page _____ of document.

Grantee(s): Birch Bay Water and Sewer District

Legal Description (abbreviated): _____
[ ] Additional legal description is on page one of document.

Assessor's Property Tax Parcel / Account Number: _____
[ ] Additional Parcel Numbers for additional legals are on page ___ of document.

REIMBURSEMENT AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20___ between BIRCH BAY WATER AND SEWER DISTRICT, a municipal corporation ("District") and _____, hereinafter referred to as “Developer/Owner”, respectively.

RECITALS:

A. The District is a duly organized water and sewer district under the laws of the State of Washington, and is empowered to furnish both water and sewer service, among other things, to property owners within and without the District in the manner provided by law; and

B. Developer/Owner heretofore entered into a Developer Extension Agreement ("Agreement") with District for the construction and installation of water and sewer system extensions to provide service to the area described on Exhibit "A" ("Developed Area") attached hereto; and Developer/Owner completed installation of water and sewer system extensions in accordance with the terms of the Agreement, portions of which are a benefit to real property within the District other than the Developed Area, which consists of water and sewer lines of a size and location described on Exhibits "B1” and “B2”, respectively attached hereto and designated "Water/Sewer Extension Facilities"; and Developer/Owner is entitled to reimbursement from developers and real property owners seeking connection to such facilities for the cost of such facilities in excess of Developer’s/Owner's fair pro rata share therefor, which costs have been determined as set forth below; and

C. The District will collect charges from the owners of property within the District, benefiting from the installation of the aforesaid Water/Sewer Extension Facilities; and such charges are the sole source of funds for the District from which reimbursement to the Developer/Owner can and will be made, as and when the same are collected; and

D. The District is permitted to enter into a Reimbursement Agreement with Developer/Owner under the provisions of RCW 35.91 *et seq.* and 57.08.005; and the parties desire to enter into a written agreement with reference to the foregoing matter;

NOW, THEREFORE, IN CONSIDERATION OF THE FOLLOWING terms and conditions, the District and the Developer/Owner agree as follows:

1. **Completion of Facilities**. The installation of the Water/Sewer Extension Facilities described on Exhibits "B1" and "B2" in the developed area have been completed by Developer/Owner under an extension agreement with the District; and title thereto will be transferred to the District, and such Facilities will be a part of the District water and sewer system.

2. **Records/Costs.** Developer/Owner has obtained and submitted to the District accurate records which have been provided to the District of the actual cost of installing such Facilities in accordance with the Agreement; and the District Engineer has reviewed and approved the costs of such Facilities as reasonable costs and District accepts such costs as costs which are subject to reimbursement; and District agrees to reimburse Developer/Owner in the manner and on the terms and conditions set forth in this agreement, in an amount not to exceed _____ for water facilities and _____ for sewer facilities, less administrative costs incurred by the District in collecting reimbursement charges. Developer/Owner agrees to reimburse the District for all administrative costs incurred by the District in collecting reimbursement charges. This reimbursement of collection related administrative costs and charges due from Developer/Owner to the District shall be deducted from the amount reimbursed to the Developer/Owner as provided in Paragraph 3.B.2. herein.

3. **Method of Reimbursement**

A. **Benefited Properties** The properties benefiting from the installation of the Extension Facilities as determined in the sole discretion of the District, and which did not contribute to the original cost thereof are as described on Exhibit "C" attached hereto.

B. **Charges.**

1. **Amount** Prior to allowing a benefited property to connect to the Extension Facilities, the District shall collect the fair pro rata share of the cost of installing such facilities as a charge from the owners of benefited properties. The benefited properties to which this provision shall apply are set forth on Exhibit "C". The

amount of such reimbursement charges to be collected prior to each connection is also set forth on Exhibit "C". Such charges may include, but are not limited to, pro rata share of District legal, engineering, administrative, set-up, handling and actual costs of the facility. Such reimbursement charges shall be in addition to all other District charges in effect at the time of seeking connection to such extension facilities, including without limitation, general facilities fees. Upon application by affected property owners, the District may further segregate reimbursement charges attributed to property benefited by the Extension Facilities. All costs of such segregation shall be borne by the party requesting such segregation.

2. **Payment** District shall deduct from all reimbursement charges it collects an amount equal to ___ per cent (_%) of each collected amount to cover its administrative collection costs, and the remaining balance shall be paid over to Developer/Owner within sixty (60) days after receipt thereof.

C. **Payment Procedure** The District shall forward reimbursement funds referenced herein to Developer/Owner or to Developer's/Owner's agent as authorized by Developer/Owner to the District in writing. Developer/Owner hereby directs that reimbursement funds be mailed to the following address, unless later directed by Developer/Owner in writing:

_____

_____

_____

As a condition of receiving such reimbursement funds, Developer/Owner or Developer's/Owner's agent shall execute a receipt to the District for such reimbursement amounts so paid upon a receipt form provided by the District. Such form shall include the legal description and name of the owner of the connecting property making payment of such amount to the District. The District shall have no obligation to segregate reimbursement funds to be received among individual property owners. Each payment will be made payable to all parties identified as the Developer/Owner in this Agreement in lump sum and it shall be the sole responsibility of the Developer/Owner to disburse funds received among individual property owners.

In the event of dispute as to the rightful party to receive such funds, District may pay the same to the Developer/Owner referenced herein or interplead such funds to the court; in either event, District shall thereupon be relieved of any further obligation or of any liability hereunder as to such reimbursement funds so paid. The Developer/Owner shall indemnify the District for any liability and costs, including attorney fees, incurred by the District in such interpleader action or in otherwise making reimbursement payment in accordance with the terms of this Agreement..

4. **District Authority; Effective Date; and Contract Duration** The District is authorized to enter into this agreement by virtue of the provisions of RCW 35.91 et seq. and RCW 57.08.005; and this Agreement shall remain in full force and effect for a period of twenty (20) years, beginning from the date of final acceptance of title to the extension facilities by the District's Commissioners. All of Developer's/Owner's rights to reimbursement shall terminate upon expiration of said twenty (20) year term, regardless of the status of reimbursement at that time.

5. **Recording** This contract shall be recorded in the office of the Whatcom County Auditor, Whatcom County, Washington, immediately upon execution by the District and the Developer/Owner.

6. **Agreement Implementation** The District will use its best efforts to collect and distribute the funds pursuant to the process set forth in this Agreement. However, the District, its officials, employees or agents shall not be held liable or responsible for failure to implement any of the provisions of this Agreement unless such failure was willful or intentional.

7. **General** This Agreement constitutes the entire agreement between the parties. All exhibits referred to herein are by this reference made a part of this Agreement as though set forth in full. This Agreement is binding upon the heirs, executors, administrators, successors and assigns, of each of the parties hereto.

8. **Assignment** The Developer/Owner shall not assign the whole or any part of this Agreement without the prior written consent of the District, and in the event of such assignment shall notify the District of the Name and address of the assignee.

9. **Contact Information.** As required by law, every two (2) years from the date of this Agreement, the Developer/Owner shall provide the District with an updated

contact information for Developer/Owner, including the current name, address, and telephone number of the person, company, or partnership that originally entered into this Agreement. If the Developer/Owner fails to comply with the notification requirements of this section within sixty (60) days of every two (2) year anniversary date as specified above, then the City may collect any reimbursement funds owed to the Developer/Owner under the Agreement and any such funds collected will be deposited in the capital fund of the District, to be used at the District's discretion for its capital purposes.

BIRCH BAY WATER & SEWER DISTRICT

By: _____

Its: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ of BIRCH BAY WATER & SEWER DISTRICT to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

_____

Print Name:_____
NOTARY PUBLIC

My commission expires:_____

DEVELOPER/OWNER:

By
Name

Address: _____

_____

Telephone: _____

By
Name

Address: _____

_____

Telephone: _____

By
Name

Address: _____

_____

Telephone: _____

By
Name

Address: _____

_____

Telephone: _____

By
Name

Address: _____

_____

Telephone: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

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Print Name:_____
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STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

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Print Name:_____
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STATE OF WASHINGTON)
) ss.
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Print Name:_____
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STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

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IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

Print Name:_____
NOTARY PUBLIC

My commission expires:_____

BIRCH BAY WATER AND SEWER DISTRICT
Whatcom County, Washington

DEVELOPER EXTENSION CHECKLIST - WATER

LOCATION: _____

PROJECT: _____ PHONE: _____

DEVELOPER/OWNER: _____ PHONE: _____

ENGINEER: _____ PHONE: _____

CONTRACTOR: _____ PHONE: _____

			DATE	AMOUNT
A.	APPLICATION			
	1.	Preliminary plans submitted to District.	_____	
	2.	Developer Project Manual obtained by Developer.	_____	
	3.	Application submitted to District.	_____	_____
	4.	Fees Paid: $500 Application Review Fee	_____	_____
	5.	District review and approval of application.	_____	_____
	6.	Board hearing if application is rejected by Commissioners.	_____	
	7.	Forward information for Agreement.	_____	
B.	PRELIMINARY			
	1.	Agreement completed by Developer.	_____	
	2.	Preliminary plan submitted to District by Developer.	_____	
	3.	SEPA/Shoreline (if required) compliance submitted to District by Developer.	_____	
	4.	Agreement approved by Board of Commissioners.	_____	

C. BEFORE PLAN REVIEW OR DESIGN

1. Fees Paid: One-half (1/2) of fee (See Agreement - Item 3B) paid by Developer. _____

2. Preliminary plat provided by Developer. _____

3. Contour map submitted to District: Scale 1" = 50' or 1" = 100' horizontal and 1" = 5' vertical. _____

4. Road/Stormwater profiles provided by Developer. _____

5. Plans submitted to District for review _____

6. Notice to proceed to District's engineer. _____

D. REQUIRED BEFORE CONSTRUCTION BEGINS

1. Plans and specifications approved by District and letter sent to Developer. _____

2. Plans and specifications sent to Whatcom County Public Works Department by District. (County Roads) _____ _____

3. Fees Paid: DOH review fee paid by Developer to District (supply, intertie or treatment projects only). _____ _____

4. Plans and specifications sent to DOH by District (transmission, storage or supply projects only). _____

5. Approval of Contractor by District. _____

6. Performance Bond (or other security) submitted by Developer. _____ _____

7. Certificate of Insurance, Insurance Questionnaire and all endorsements submitted by Developer. (Asbestos Insurance required/provided?) _____

8. Revocable encroachment permit (County roads) obtained by District. _____ _____

9. Other State, County and/or Federal permits acquired by Developer. _____

10. DOH approval received (see #5 above). _____

11. Hold harmless letter submitted to District if construction is to start prior to agency approval(s). _____

12. Material and equipment list submitted by Developer. _____

13. Preconstruction meeting held by Developer. (Minimum 7 days' notice required for scheduling) _____

14. Construction stakes in place by Developer a minimum of 2 days prior to construction. _____

15. Property boundary stakes in place by Developer. _____

16. Third party easements secured and submitted to District by Developer. _____ _____

17. Fees Paid:
Additional one-half (1/2) of fee (See Agreement - Item 3B) paid by Developer. _____ _____

18. Fees Paid:
One-half (1/2) of water connection charge paid by Developer. _____ _____

E. CONSTRUCTION

1. District approves construction start. _____

2. District inspects project. FROM: _____ TO: _____

3. Pressure test, disinfection and bacteria test completed and passed. _____

4. Punch list submitted to Contractor and Developer. _____

5. Punch list items inspected and revised punch list submitted to Contractor and Developer

if necessary. _____

6. Final inspections and approval. _____

7. Letter to Developer requesting as-builts, easements, and bill of sale. _____

8. Memo to file that project is "construction complete". _____

F. AFTER CONSTRUCTION

1. Easement restoration releases sent to property owner. _____

2. Contractor performs additional work on easement restoration, if necessary. _____

3. Easement restoration releases signed and submitted to District. _____

4. Reproducible as-built construction drawings and final easements submitted to District for review. _____

5. As-builts and easements returned to Developer's engineer for revisions, if necessary. _____

6. Easements signed by Developer and returned to District. _____

7. Executed Bill of Sale and Certification of Costs delivered to District. _____

8. Easements, approved and recorded by District. _____

9. Project cost submitted to District Treasurer for inclusion in Plant-in-Service. _____ _____

10. As-builts approved, 1/4 sections and general map revised. _____

11. Pick up billing on A/R. _____

12. Developer expenses brought current and paid. _____ _____

13. Fees Paid:
Remaining one-half (1/2) of water connection charge paid. _____ _____

14. District pays payback amount to proper parties, if necessary. _____ _____

15. Developer/Owner executes no-protest annexation agreement with City of Blaine if project located within City Urban Growth Area. _____

16. District accepts title to system extension. _____

17. Engineer completes Construction Report for Public Water System Projects to District file. _____

18. Execution and recording of payback agreement by District. _____

19. Release of performance bond (or other security) by District. _____ _____

20. Begin two-year warranty period. _____

21. Maintenance Bond submitted by Developer _____ _____

G. FINAL ACCEPTANCE

1. 11 and 23-month warranty inspection completed by District. _____

2. Developer makes warranty corrections, if necessary. _____

3. District makes final acceptance. _____

4. Release of maintenance bond by District _____

5. Release excess fee to Developer by District. _____ _____

6. Letter sent to Developer stating project has been completed. _____

BIRCH BAY WATER AND SEWER DISTRICT

DESIGN AND CONSTRUCTION STANDARDS - WATER

1. GENERAL

All extensions to the water system must conform to the standards of the District and the requirements of the County and State Departments of Health. In general, the Developer is required to construct the water lines through his property in order to allow for future extension, expansion and continuation of the District's distribution system and/or for conformance with the Comprehensive Water System Plan. The following items are necessary to meet the conditions.

The District and its consultants do not insure the correctness of the information supplied to the Developer from the District's records. The Developer shall verify by survey any information provided by the District prior to using the information in design or construction.

A. Plans and Specifications

The installation of water extensions shall be made in accordance with these Conditions and Standards. The scale shall be: horizontal 1" = 50' or other scale as appropriate for the specific project, subject to the approval of the District; vertical 1" = 5' on 22" x 34" mylar. The minimum text height shall be 0.12 inch. The plans shall be sealed by a Professional Engineer licensed in Washington. Enclosed is a sample plan showing a typical water design. Drafting of plans for the District shall conform to this example. The water extension shall be shown on a sheet separate from the sewer, storm drainage and roadway plans. The plans shall indicate the distance from the point of connection to the nearest existing isolation valves. If the project is part of a phased development, a plan of the entire development shall be included, with the current phase clearly indicated.

The construction plans shall be reviewed or prepared by the District's Engineer. The developer shall submit two (2) sets of printed plans for review by the District. When the plans have been determined to meet the District standards, then a final set of reproducible plans shall be submitted to the District. These reproducible plans shall receive the District's "Plan Review" approval stamp. The District shall submit the plans to the regulatory agencies for approval, if necessary. After approvals have been received, a set of plans stamped "Issued for Construction" shall be made available to the Developer.

When the Contractor completes the water line work, the water plans shall be revised to conform with construction records, and then sent to the District. Archival quality plots on mylar are required for District record drawings.

B. Right-of-Way and Monuments

All existing rights-of-way in which the water extension is to be made shall be improved prior to preparation of construction plans and installation of the water mains. Water mains in public right of way shall be a minimum of five (5) feet from the edge of right-of-way. Permanent easements shall be not less than twenty feet (20') in width. Public rights-of-way shall be cleared, grubbed and graded in accordance with the requirements of Whatcom County. Monuments disturbed or destroyed shall be replaced at the Developer's expense.

2. DESIGN STANDARDS

A. The water system extension shall be routed as necessary to meet the following criteria:

i. Provide water line to serve all the frontage of all lots or structures in the proposed development.
ii. Connect between the water system in the proposed development and the District's existing water distribution system at the location and in the manner (e.g., "wet tap" on main, connection at existing plugged or capped end, "cut-in" tee and valves) indicated by the District.
iii. Extend water line through the property for potential future connection in accordance with the District's Comprehensive Water System Plan or as required by the District.
iv. "Loop" the water system within the proposed development and/or with multiple connections to the existing water distribution system in accordance with the District's Comprehensive Water System Plan or as required by the District or as required to provide the required flow to the most remote fire hydrant in the proposed water extension.
v. Locate the water system in the public right-of-way to the maximum extent feasible.
vi. Locate valves at two of three branches of tee connections, three of four branches at cross connections, additional valve at tee or cross connection at discretion of District for present or future needs, at changes in pipe diameter and at intervals of no more than 800 feet along the water main in the distribution system and 1,320 feet in transmission mains. Valve spacing shall not exceed 500 feet in commercial, industrial and multi-family districts. Additional valves

may be required at each connection, at the District's discretion, to facilitate flushing or other operation and maintenance needs.

B. Water line size shall be determined as necessary to meet all of the following criteria, subject to approval by the District:

i. In accordance with size indicated in District Comprehensive Water System Plan.
ii. As necessary to maintain minimum pressure in system of 20 psi under minimum fire flow and maximum day demand operating condition, and as necessary to maintain minimum pressure in system of 30 psi under maximum day and peak hour demand operating conditions, always with maximum velocity of eight feet per second and maximum pressure of 80 psi.
iii. Minimum diameter of 8 inches if providing fire flow to a fire hydrant assembly.
iv. Maximum of 50 feet of 6-inch diameter of lateral to a fire hydrant from the distribution main.
v. Minimum of 4-inch diameter for distribution main without fire flow and hydrants and serving more than 10 single-family residences, subject to pressure and velocity limits in ii above.
vi. Minimum of 2-inch diameter for distribution main without fire flow and hydrants and serving less than 10 single-family residences, subject to pressure and velocity limits in ii above.
vii. 4-inch diameter and larger mains shall be cement-lined ductile iron, pressure class 350, polyethylene encased, per Specification Section 02610.
viii. 2-inch diameter water mains shall be 200-psi high-density polyethylene, per Specification Section 02610.

C. Water system extensions shall be sized for the following minimum fire flows according to Whatcom County Zoning Designation, or greater as required by the local fire district or Whatcom County Fire Marshal, or as indicated in the District's Comprehensive Water Plan:

Zoning	Fire Flow and Duration
R5A, R10A	Not required for new development
URM6	750 gpm for 60 minutes
UR4	500 gpm for 60 minutes
RC, NC, GC	Along Birch Bay Drive, 1,500 gpm for 120 minutes. In the GC area at the intersection of Blaine and Alderson Roads, 1,250 gpm for 60 minutes. Otherwise, 1,000 gpm for 120 minutes as required by the County Fire Marshal.

D. Gate valves shall conform to AWWA C-509 or C-515 Resilient Seat and shall be furnished with a concrete valve marker. Valve marker shall be

painted and stenciled to District requirements. Valves 12" and larger shall be butterfly valves. See Specification 02640.

E. Valve boxes in shoulder of road shall be buried with valve markers located as required.

F. The minimum cover on water mains shall be three feet unless otherwise approved by the District's Engineer, or as required by Road Agency.

G. Water side services shall be 200 PSI P.E. pipe ASTM D2239 (3/4" single and 1" double) with brass fittings (see parts list on detail). The service line shall be installed to within 12 inches of property line of each lot and shall be 18 inches below grade to top of meter stop.

H. Meter boxes shall be furnished and installed by the Developer.

I. Casings under roadway for far side services may be required.

J. Fire hydrants shall conform to AWWA C-502 and shall be M&H Style 929 Reliant, Clow Medallion, Waterous Pacer WB-67, or Mueller Super Centurion 250 with a 5¼ inch main valve opening equipped with a Storz adapter No. S-37 and two (2) 2-1/2" Hose Connections (all N.S.T.) Refer to Section 02645 for complete hydrant specifications. Fire hydrants shall be spaced at distances appropriate for the type of development with a maximum distance of 250 feet from the hydrant to the furthest structure. Areas with flow requirement greater than 2,000 gpm will require closer hydrant spacing, per local code and fire official requirements. All fire flow rates, number, location and spacing of fire hydrants shall be as required by the local fire official. Where the rate of fire flow required for a specific building is greater than 1,000 gpm, more than one point of supply from the system is required, with a maximum of 1,000 gpm per fire hydrant. Fire hydrants shall be painted with two coats of paint to meet District requirements and installed without guard posts. Hydrant main sizes shall be 8" diameter on dead end mains. Six-inch (6") laterals to hydrants shall be a maximum of fifty feet (50') in length. When lateral exceeds 50 feet, gate valves shall be installed on the lateral at the mainline tee and within 10 feet of the hydrant. See Standard Details and Specification 02645.

K. A two (2) inch or four (4) inch blow off assembly as required by the detail shall be installed at all dead-end water mains (temporary or permanent). Air and Air Vacuum relief valves shall be installed at high points of water transmission and distribution mains, except where waived by the District.

L. Water lines shall generally be located on the north or east side of the public right-of-way, in accordance with the Whatcom County Development Standards.

M. Water line marker posts shall be installed at changes of direction, at terminations and every 300 feet along water lines on easements.

N. Galvanized pipe shall not be used underground.

O. Valves on dedicated fire sprinkler or other fire protection service lines shall be installed with post-indicator assemblies. Maximum height for the post indicator shall be 36 inches above the adjacent grade.

P. A double detector check assembly is required between the potable water system and private fire sprinkler and/or standpipe connections. The use of fire retardants, anti-freeze or other hazardous additives in the fire sprinkler system is prohibited.

Q. Booster pump stations and water storage facilities shall be sized in accordance with the District's Comprehensive Water System Plan. In general, booster pump stations (BPS) shall be designed under the following criteria, and in accordance with a project-specific report and plan approval process, with review by DOH:

i. Located above grade in permanent building, with paved access, on site with appropriate drainage facilities and protected from flooding.
ii. Building shall be of low-maintenance durable construction in conformance with local codes and regulations. Building materials shall be split-face CMU walls with metal roofing, or as otherwise agreed by the District.
iii. BPS shall have potable water pumps with non-overloading motors, minimum of two for domestic demand, and three or more if fire flow is to be provided by the BPS. Pumps and pumping system shall have capacity to meet the pressure, maximum day demand, and, as applicable, fire flow demand requirements for the station's service area.
iv. BPS shall include isolation valves, check valves, pressure regulating valves, and flow meter.
v. BPS shall be automatically controlled as appropriate for its location and purpose in the water system, with telemetry to District Headquarters.
vi. BPS shall have on site standby power facilities unless otherwise waived by the District.
vii. BPS shall be designed in accordance with the requirements of the DOH Water System Design Manual, latest edition.

R. Water system extensions shall also comply with the DOH Water System Design Manual and Whatcom County Coordinated Water System Plan (WCCWSP), latest editions. If there is a conflict between the requirements of this document, the Design Manual and the WCCWSP, the stricter requirements shall govern.

3. EASEMENTS

Legal descriptions for easements to be dedicated to the District for all portions of the water system which lie outside of public street rights-of-way shall be signed and stamped by a professional land surveyor and transmitted to the District.

Easements shall be a minimum of twenty (20) feet in width, or as required by the District. An easement may coincide with another utility easement, except that all sanitary sewer lines must be ten feet or more from water lines and other utilities must be a minimum of five feet from the waterlines. Water lines shall be located no closer than ten (10) feet from the easement edge. At the discretion of the District, there shall be a separate easement provided for each lot that a waterline crosses. These easements are required by the District regardless of easements recorded with property deeds or plats.

Easements must be approved by the District prior to water service connection.

4. CONSTRUCTION AND INSPECTION

A. Installation and Inspection

No work on the water system shall be performed without a District Inspector being present. The District may refuse acceptance of any portion of the work installed without the Inspector having reviewed the work. The District must be notified a minimum of two full work days in advance of a firm starting date and time to arrange for and schedule the Inspector. Work must proceed in a continuous manner. If there are breaks in construction, there must be two working days' notice before beginning work again.

The approved construction plans and specifications shall be followed. No deviations will be allowed without request for change and approval received from the District. The District reserves the right to order changes in the event of conditions or circumstances discovered during construction; such changes could result from the ability or care shown by the Contractor, natural and man-made conditions, or any other reason.

The Contractor shall exercise extreme care in checking and cleaning all pipes and fittings of dirt, debris, and/or any foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal system installed when it is to be left for any period of time, including lunch breaks, coffee breaks, and overnight. Pipe and fittings will be cleaned before installation if contaminated by dust, smoke, exhaust or any other material. Material contaminated by petroleum products or questionable chemical will be rejected. No trench water is to be allowed to enter installed system.

All taps of existing District mains must be performed while the District Inspector is present.

Final tie-in to the existing District system will not be permitted until after acceptance of the entire installation by the District. Acceptance will not be

made until all submittals required are completed and after acceptable system installation is complete.

The entire water system shall be hydrostatically pressure tested as in accordance with Specification Section 02660, Waterlines, of this manual. The Contractor shall provide all testing equipment. The final testing shall be performed in the presence of the District's Inspector.

Before being placed into service, all new water mains and repaired portions of or extensions to existing mains shall be disinfected in accordance with Specification Section 02660, Waterlines, of this manual.

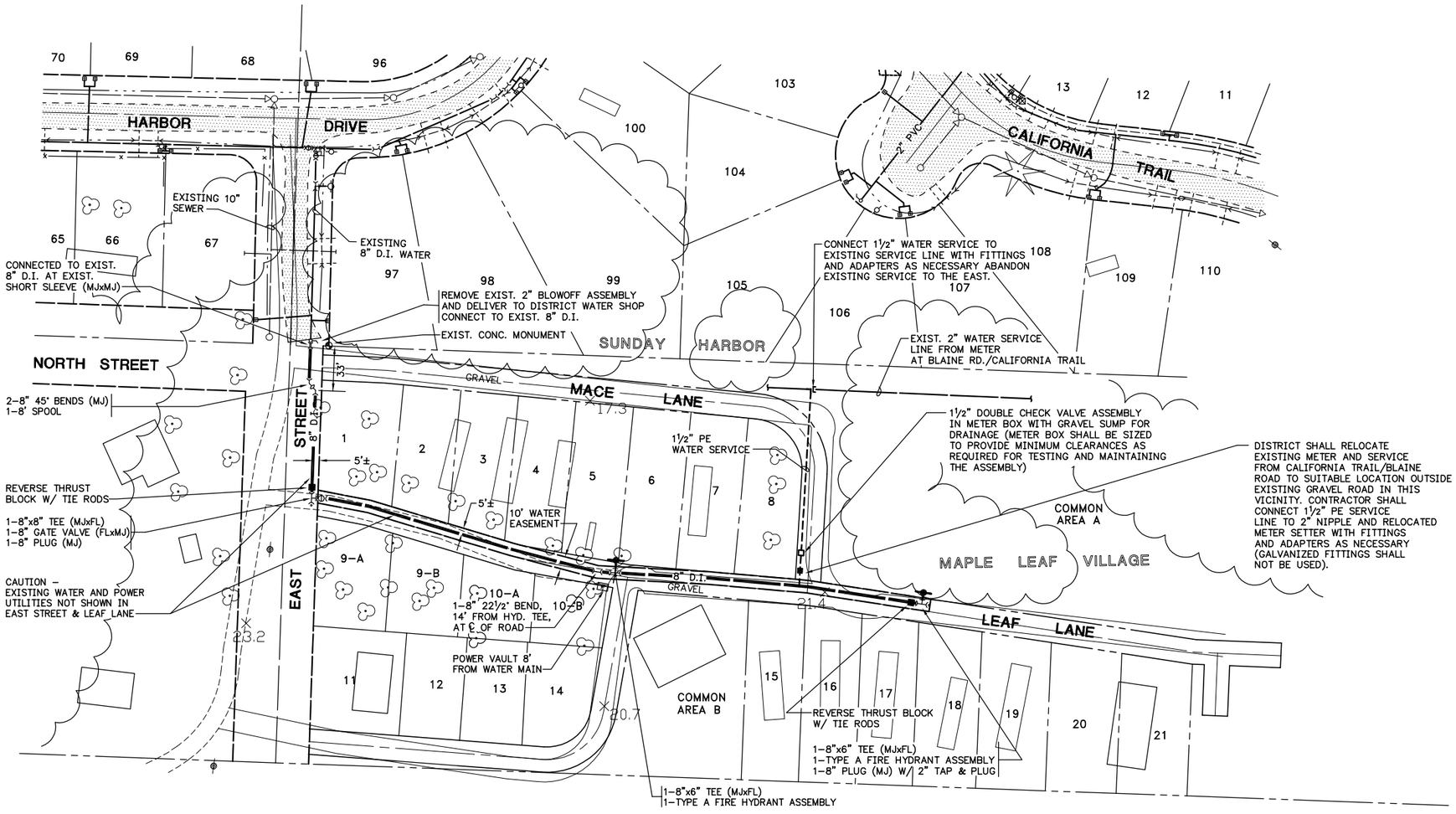
B. As-Built Drawings

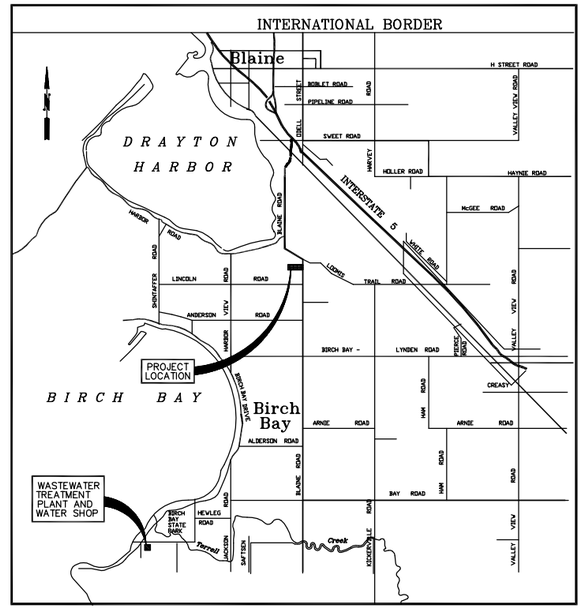
When the Contractor completes the water system work, the water plans shall be revised to conform with construction records, and then sent to the District. Archival plots on mylar are required for the District's record drawings. Prior to submitting revised plans, valve and blowoff location and horizontal alignment shall be verified by a professional land surveyor. The location and type of all installed fittings shall be shown relative to monuments, lot corners, etc. Where butterfly valves are used, the location of the operating nut relative to the pipe centerline shall be shown.

GENERAL NOTES

USE THE NOTES PROVIDED IN THE DEVELOPER MANUAL.

A PORTION OF SECTION __, T__ N., R_E., W.M. WHATCOM CO., WASHINGTON





VICINITY MAP

NOT TO SCALE

LEGEND

- EXIST. DRIVEWAY / ACCESS (GRAVEL)
- EXIST. ASPHALT PAVEMENT
- EXIST. DITCH LINE
- EXIST. FENCE LINE
- EXIST. SEWER LINE
- EXIST. WATER LINE
- PROPOSED WATER LINE
- EXIST. CULVERT
- FIRE HYDRANT (FH)
- WATER VALVE (WV)
- BLOW-OFF ASSEMBLY
- PROPOSED WATER SERVICE
- EXISTING WATER SERVICE
- EXIST. UTILITY POLE
- EXIST. ROAD SIGN
- EXIST. TREES
- EXIST. UTILITY BOX

CALL 2 BUSINESS DAYS BEFORE YOU DIG 1-800-424-5555

No.	Date	By	Ckd.	Appr.	Revision

STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

Drawn By ____ Date ____ Checked By ____ Date ____

Designed By ____ Date ____ Approved By ____ Date ____

BIRCH BAY WATER & SEWER DISTRICT

Scale: Horiz. 1"=50' Vert. ____

Job No. ____

PROJECT NAME

WATER PLAN

Sheet 1 Of 1

DE #

STANDARD GENERAL NOTES

1. **ALL WORK SHALL CONFORM TO THE RULES AND REGULATIONS OF BIRCH BAY WATER AND SEWER DISTRICT. THE STANDARD DETAILS AND SPECIFICATIONS ARE CONTAINED IN A BOUND VOLUME TITLED "DEVELOPER PROJECT MANUAL", INCLUDED HEREIN BY REFERENCE.**

2. **THE DISTRICT SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY BIRCH BAY WATER AND SEWER DISTRICT.**

3. **TYPICAL WATER SERVICE TO BE 200 PSI P.E. ASTM D2239 (3/4" SINGLE AND 1" DOUBLE SERVICE).**

4. **WATER MAINS ARE TO BE PRESSURE CLASS 350 CEMENT LINED DUCTILE IRON SIZE NOTED ON PLANS PER SECTION 2610 OF THE SPECIFICATIONS.**

5. **SERVICES SHALL BE LOCATED TO PROVIDE WATER SERVICE ON OPPOSITE SIDE OF LOT FROM SEWER STUB LOCATION.**

6. **ALL VALVES ADJACENT TO TEE OR CROSS SHALL BE FLANGE CONNECTED.**

7. **ALL VALVES SHALL BE FURNISHED WITH A CONCRETE VALVE MARKER.**

8. **LOCATIONS SHOWN ON EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON. SEE SECTION 02760 OF SPECIFICATIONS.**

9. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR HIS ENGINEER.

10. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND EIGHTEEN (18) FEET VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SITUATIONS OCCURRING WITH LESS THAN MINIMUM SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH SECTION C1-9.1 OF THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, LATEST EDITION.

11. WHILE CUTTING OR WORKING WITH ASBESTOS CEMENT PIPE, ALL FEDERAL, STATE AND LOCAL REGULATIONS MUST BE OBSERVED.

NOTICE:

CAUTION -- EXTREME HAZARD -- OVERHEAD ELECTRICAL SERVICE LINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. ELECTRICAL LINES SHOWN ON THE DRAWINGS ARE LOCATED BY POINT-TO-POINT, POWER-POLE-TO-POWER-POLE CONNECTION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND DETERMINE THE EXTENT OF HAZARD AND REMEDIAL MEASURES AND SHALL TAKE WHATEVER PRECAUTIONS MAY BE REQUIRED. SEE SECTION 02760 OF SPECIFICATIONS.

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we, _____, the Developer/Owner/Contractor named in the Developer Extension Agreement hereinafter referred to as PRINCIPAL, and _____ as SURETY, are held and firmly bound unto the State of Washington, and unto the_____, hereinafter called the District named in said Developer Extension Agreement, _____ _____ in the penal sum of _____ DOLLARS ($_____), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, assigns, administrators and successors jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that Whereas, the Principal entered into a contract with the District, dated _____, 20___, for providing such Work in connection with the _ _____Developer Extension Project in Birch Bay, County of Whatcom, State of Washington.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform all of the provisions and fulfill all of the undertakings covenants, terms, conditions and agreements of said Developer Extension Agreement during the period of the original contract and any extensions thereof that may be granted by the District, with or without notices to the surety; and during the life of any guarantee required under the Developer Extension Agreement; and shall also well and truly perform and fulfill all of the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Developer Extension Agreement that may hereafter be made; notice of which modifications to the surety being hereby waives; and furthermore shall pay all laborers, mechanics, and subcontractors and material men, and all persons who shall supply such person or persons and such principal or subcontractors with provisions and supplies for the carrying on of such work, shall indemnify and safe harmless District from all costs and damage by reason of the principal's default of failure to do so, and shall pay the State of Washington sales and use taxes, and amounts due said state pursuant to Titles 50 and 51 of the Revised Code of Washington then this obligation to be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bonded parties have executed this instrument under their separate seals this _____ day of _____, 20___, the name and corporate seal of each corporate party hereto affixed, and these presents duly signed by its undersigned representatives pursuant to authority of its governing body.

_____
PRINCIPAL

TWO WITNESSES:

_____

_____

ATTEST (If Corporation)

By:_____

Title:_____

Corporate Seal:

_____
SURETY

By:_____

Title:_____

CERTIFICATES AS TO CORPORATE SEAL

I hereby certify that I am the (Assistant) Secretary of the Corporation named as Principal in the within Bond: that _____ who signed the said Bond on behalf of the Principal was _____ of said Corporation, that I know his signature thereto is genuine, and that said Bond was duly signed, sealed, and attested for and in behalf of said Corporation by authority of its governing body.

_____
Secretary or Assistant Secretary

A copy of this bond shall be filed with the County Auditor

BILL OF SALE
FOR WATER MAIN AND SEWER MAIN EXTENSION
IN ACCORDANCE WITH CONDITIONS AND STANDARDS
FOR OWNER OF WATER AND SEWER EXTENSIONS

THIS BILL OF SALE is made this _____ day of _____ , 20__, by and between the developers of,_____ , known as _____, a Washington corporation, hereinafter referred to as "Owner", and BIRCH BAY WATER AND SEWER DISTRICT, a municipal corporation, hereinafter referred to as "District".

In consideration of the District agreeing to the Owner's extension of the District's water and sewer system, the Owner, by this Bill of Sale, hereby transfers and conveys in all respects the extended water main and sewer main as described herein to the District as follows:

1. Transfer and Description of Water Main and Sewer Main Extensions. The Owner does hereby transfer, convey and assign all right, interest and title to the District by way of this Bill of Sale to that property described on Exhibit A attached hereto and incorporated fully herein by this reference.

2. Costs. The total cost, including administration, legal engineering and construction for the water main and sewer main extensions is outlined on Exhibit B attached hereto and incorporated fully herein by this reference.

3. Representations. The Owner hereby represents that they are the true and lawful Owners of said property and that water main and sewer main extensions as described above is free and clear of all encumbrances; that all bills for labor and materials have been paid in full by the Owner and Developer/Owner has provided to District a certificate or statement from Developer/Owner's Contractor and Engineer, each acknowledging they have been paid in full; that the Owner has the right to transfer said title and will warrant and defend the same against any lawful claims and demands of all persons for a period of one (1) year from the date of this Bill of Sale; and that the Owner hereby warrants and represents that this Bill of Sale is hereby executed and the water main and sewer main extensions are hereby transferred, assigned and conveyed in all respects to the District in consideration of incorporating the extension into the overall water and sewer system of the District.

4. Warranties. The Owner warrants that for a period of two (2) years from the date of this Bill of Sale the water and sewer system will remain in perfect working order and condition except where abused and neglected by the District, and the Owner will repair or replace at its cost and expense any work or material that may prove to be defective during the two (2) year period of said warranty.

DATED the day and year first written above.

By_____
President
By_____
Secretary

STATE OF WASHINGTON)
)ss
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ and _____ signed this instrument, on oath stated that they were authorized to execute the instrument, and acknowledged it as the President and Secretary of _____, a Washington corporation, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

Dated:_____

_____
NOTARY PUBLIC in and for the State of Washington. My commission expires_____

EXHIBIT A

Approximately:

1. _____ lineal feet of ____" water line; and
2. _____ lineal feet of ____" sewer line.

Beginning _____ and extending therefrom approximately _____ feet _____ along _____.

EXHIBIT B
CERTIFICATION OF COSTS OF CONSTRUCTION
OF DEVELOPER EXTENSION (WATER) CONVEYED TO
BIRCH BAY WATER AND SEWER DISTRICT

The undersigned is the Developer of the plat of _____ and has, pursuant to an agreement with Birch Bay Water and Sewer District dated the _____ day of _____, 20____, constructed certain water facilities which after connection to the water system of Birch Bay Water and Sewer District are to be conveyed to the District by the Developer.

In accordance with the terms of the said Developer Extension Agreement between the undersigned and Birch Bay Water and Sewer District, the undersigned hereby certifies that the costs of construction of the facility being conveyed to the District pursuant to said Developer Extension Agreement are as follows:

A.	Materials	$_____
B.	Labor	$_____
C.	Engineering	$_____
D.	Permits & Fees	$_____
E.	Other Costs	
	_____	$_____
	_____	$_____
	_____	$_____
	TOTAL COSTS OF CONSTRUCTION OF FACILITY	$_____

CERTIFIED TO BIRCH BAY WATER AND SEWER DISTRICT BY _____
(insert name of developer if an individual or corporation if a corporate developer)

BY _____, President

Corporate Seal
(if required)

BY _____, Secretary

INDIVIDUAL ACKNOWLEDGEMENT:

STATE OF WASHINGTON)
)ss
COUNTY OF WHATCOM)

On this day, personally appeared before me _____, to me known to be the individual described in and who executed the within and foregoing instrument and acknowledged to me that he signed the same as his free and voluntary act and deed for the uses and purposes therein mentioned.

WITNESS my hand and official seal this _____ day of _____, 20___.

_____
NOTARY PUBLIC in and for the State of Washington,
residing at _____

MAINTENANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That we,_____, as Principal, and _____ _____, a corporation organized and doing business under and by virtue of the laws of the State of Washington, and duly licensed to conduct a general surety business in the State of Washington as Surety, are bound unto Birch Bay Water and Sewer District as Obligee in the sum of _____ _____($_____) Dollars for which payment, well and truly to be made; we bind ourselves, our heirs, executors, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THE OBLIGATION is that the above named Principal has caused to be constructed water and/or sewer systems in that subdivision known as _____ located in Section ___, Township ____ _____, Range ___ _____, of W.M., Whatcom County, Washington; and

THE FURTHER CONDITION is that the undersigned warrants the performance and guarantees the workmanship and materials used in the construction of the water and/or sewer systems and will make repairs, correct deficiencies, and perform other than routine maintenance for a period of two years from the acceptance of said water and/or sewer systems as constructed to District Standards, by the District.

IN ADDITION, if the water and/or sewer systems require repairs or maintenance within the two-year period, the parties agree to reimbursement as follows:

1. The District shall perform all emergency repairs. If damage was caused because of faulty workmanship, materials, or design, then the District shall be reimbursed for its efforts. If the emergency did not relate to the workmanship, materials, or design, then the District shall bear the costs of repair.
2. If the repair or maintenance is not of an emergency nature but still is the result of faulty workmanship, materials, or design, then the District shall give the undersigned a seven (7) day written notice to repair the damage which will be repaired by the undersigned at their expense. If, after seven (7) days, the repairs are not done or efforts to rectify the situation are not agreed to, the District shall then do the work at the expense of the undersigned.
3. If it is routine maintenance or repair not related to the workmanship, materials, or design of the water and/or sewer systems, then the District shall perform the work at its own expense.

At the end of the two-year period, the undersigned shall request the District to cause an inspection of the water and/or sewer systems and, if found to be in condition satisfactory to the District, then this obligation shall become null and void, and any

remaining funds shall be returned to the undersigned; otherwise this bond shall remain in full force and effect until the water and/or sewer systems are placed in satisfactory condition.

IN WITNESS WHEREOF, the seal and signature of the said Principal is hereto affixed and the corporate seal and the name of the Surety is hereto affixed and attested by its duly authorized attorney-in-fact at _____, Washington, this _____ day of _____, 20_____.

PRINCIPAL	SURETY
_____	_____
Address:_____	Address:_____
_____	_____

ASSIGNMENT OF BANK SAVINGS ACCOUNT

FOR VALUE RECEIVED**,** the undersigned developer (hereinafter referred to as "Developer") does hereby assign and set over to the Birch Bay Water and Sewer District, State of Washington, all right, title, and interest in and to _____, ($_____) Dollars in Savings Account No. _____ ("Savings Account") in the _____ Bank, _____ Branch ("Bank"), in the name of the Birch Bay Water and Sewer District ("District") with sole power and authority to demand, call and receive said deposit and to give receipt and acquittance therefore in the event the Developer fails to perform in accordance with the provisions of _____ Developer Extension Agreement and/or District requirements. This Assignment shall be subject to the following terms and conditions.

1. This Assignment is limited to the principal sum, or $_____ only. This Assignment shall not relate to any interest which accrues on said account, and said interest may be withdrawn by the Developer at any time.

2. This Assignment is for providing a security deposit with the Birch Bay Water and Sewer District to assure performance of Developer obligations in accordance with the _____ Developer Extension Agreement and other requirements of the District for property located at _____, Washington.

3. It is understood and agreed that _____ Bank holds the passbook covering said Savings Account in its possession and agrees to hold $_____ until a release of this Assignment from the District is received. It is further understood that this Assignment is subject to judgments which may be rendered against _____ in accordance with the provision(s) of the District Developers' Extension Agreement. Release of this deposit will be in accordance with the rules and regulations adopted by _____Bank and this Assignment.

4. In the event that the Developer declines, defaults or fails to perform on the obligation(s) referred to above, as determined by the District, a written notice shall be sent to the Developer requiring performance to be complete within seven (7) days after the date of mailing of said notice, unless a longer time is allowed in the sole discretion of the District. If the performance is not complete as required by the notice or any extension thereof granted in the sole discretion of the District, the District shall have the right to proceed with the work itself, including select and retain contractors for the work, and shall charge all costs, labor, materials, engineering, legal, taxes, incidental costs and expenses and a five percent (5%) administrative overhead fee to the Developer's account. The District shall thereupon send an invoice for its charges to the Developer and to the Bank, and within ten (10) days of receipt of said invoice, the Bank shall pay the same to the District from the funds held in the assigned Savings Account.

5. Upon final completion of the obligations under the above-referenced Developer's Extension Agreement and satisfaction of all related District requirements, the Developer may apply to the District for a release of any remaining funds held in the assigned Savings Account. If the District finds, in its sole discretion, that the work has been satisfactorily completed it shall notify the Bank, in writing, that the remaining balance of the funds in the assigned Savings Account may be released to Developer. Upon said funds being released this Assignment shall terminate and no party shall have any further obligations hereunder.

6. This Assignment is irrevocable without the written consent of the District. The Assignment shall continue in effect until the obligations secured hereby are completed to the satisfaction of the District. The assigned funds shall be held exclusively for the benefit of the District and shall not be subject to further assignment or encumbrance of the Developer or attachment by any creditors of the Developer.

7. Time is of the essence. If litigation is filed to enforce any term of this Assignment, the prevailing party, as between the District and the Developer, shall be entitled to judgment for court costs and reasonable attorney's fees incurred therein.

8. Notices required or sent pursuant to this Assignment shall be sent by first class mail to the parties hereto at the following addresses:

District:
General Manager
Birch Bay Water and Sewer District
7096 Point Whitehorn Road
Birch Bay, WA 98230

DEVELOPER: _____
_____
_____

BANK: _____
_____
_____

Each party hereto shall be responsible for providing written notice to the other parties of any change in address.

9. This Assignment is binding upon the parties, their heirs, successors and assigns.

Signed and dated at _____, Washington, this _____day of_____, 20__.

_____
Developer

By: _____
Title:_____

APPROVED AND ACCEPTED:

The undersigned hereby accepts the foregoing Assignment of Savings Account No._____
In the amount of $_____ in satisfaction of bond requirement of the _____Developer Extension Agreement and Birch Bay Water and Sewer District.

Birch Bay Water and Sewer District

By:_____Title:_____
__

APPROVED AND ACCEPTED:

The undersigned accepts the forgoing assignment and to host said account pursuant to the terms thereof.

_____Bank _____Branch

By:_____ Title:_____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

_____
Print Name:_____
NOTARY PUBLIC
My commission expires: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

Print Name:_____
NOTARY PUBLIC
My commission expires: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

Print Name:_____
NOTARY PUBLIC
My commission expires: _____

11- AND 23- MONTH INSPECTION

Final inspection report for:

1. Name of Development _____

2. Contractor _____

3. Developer _____

4. Date of Inspection _____

5. Inspector _____

INSPECTION CHECKLIST:

a. Condition of Roadway: _____

_____

b. Condition of Water Main: _____

_____

c. Condition of Valves, Fire Hydrants, blow-offs, etc.: _____

_____

_____

d. Any other utilities problems visible; water boxes, valve box, light poles, storm drains, etc.

_____

_____

_____

e. What conditions need to be corrected in order to approve project. Use additional page(s), if necessary:

_____

_____

SECTION C

DEVELOPER SEWER EXTENSION

BIRCH BAY WATER AND SEWER DISTRICT

Whatcom County, Washington

CONDITIONS AND STANDARDS

FOR

DEVELOPER SEWER EXTENSIONS

Pursuant to the Municipal Water and Sewer

Facilities Act

(RCW 35.91)

EXTENSION: _____

DEVELOPER: _____

_____

PROPERTY OWNER _____

_____

DATE: _____

BIRCH BAY WATER AND SEWER DISTRICT
WHATCOM COUNTY, WASHINGTON

APPLICATION FOR DEVELOPER EXTENSION
TO SANITARY SEWER SYSTEM

1. The undersigned applies to Birch Bay Water and Sewer District, Birch Bay, Washington, for permission to construct and install an extension of the District's sanitary sewer system located in public rights-of-way under the District's franchise, and/or on easements over private property to connect to the District's sanitary sewer system, all of which are subject to the approval of the District.

2. A check for the $500.00 review fee for this application is attached.

3. The proposed extension will be installed in roads and/or easements and/or on other approved public rights-of-way and shall be for the use and benefit of the property legally described as follows:

   The common street address of the property is _____,

   and the legal description of the property is:_____

   _____

4. (a) Describe the type of improvements planned for the above-described property, i.e., single family residences, other individual residential units or commercial usage, and the proposed number of units.

   _____

   _____

   _____

   (b) Attached to the application shall be two copies of each of the following:

   - A preliminary plan setting forth the proposed development.

     The plan shall include property boundary lines, indication of type of development, location of roads, building and/or other important features, type of building construction, and the number of units shall be stated.

   - A final or preliminary plat map or property map of the property to be developed.

- A contour map of the area with a five foot contour interval or less. Datum shall be based on the most recent U.S.C.G.S. with benchmark locations shown.

- Existing and proposed roadway profiles.

5. Set forth the proposed date for construction of the project and the anticipated completion date for the project:

   Start of Construction:_____

   Completion Construction:_____

6. Set forth common street address and telephone number of Developer and Property Owner:

   Developer:_____

   Property Owner:_____

7. (a) Have you made an application to Whatcom County or any other municipality having jurisdiction of the project for a building permit or for approval of a plat, a short plat, a rezone or a planned unit development? If yes, list the name of the agency or agencies and type of action requested.

Name of Agencies	Type of Action	Dates Applied

   (b) Have you prepared an environmental checklist, negative declaration of EIS?

   Yes _____ No _____

   If yes, list name of lead agency:

   _____

   Date of application:_____

   If an EIS, negative declaration or checklist has been completed, attach a copy.

8. The Developer Project Manual includes a Developer Extension checklist. Please advise if there are any items on the checklist with which you have a question or you cannot comply.

_____

_____

_____

9. Do you want the District's consultants to prepare the plan for the proposed project?

Yes _____ No _____

Prepared by: _____
Date: _____

Developer: _____
Telephone No.: _____

Property Owner: _____
Telephone No.: _____

Engineer: _____
Address: _____
Telephone No.: _____

Architect: _____
Address: _____
Telephone No.: _____

Contact Person: _____
Address: _____
Telephone No.: _____

REVIEW OF APPLICATION

DEVELOPER SEWER EXTENSION

1. Have all the questions in the application been adequately addressed?

   Yes _____ No _____

   Comments:_____

   _____

2. Upon the submission of the preliminary plan to the District, the District's Engineer and General Manager will estimate the wastewater flow for the contemplated improvement. Does the anticipated flow exceed the capacity of the contemplated improvement and/or existing system?

   Yes _____ No _____

3. Is a latecomer's charge, connection charge, or other charges against the real property subject to the developer extension?

   Yes _____ No _____

4. Is the project located in the Urban Growth Area?

   Yes _____ No _____

5. Is the project in an annexed area?

   Yes _____ No _____

   If no, has the Owner requested the District to initiate the annexation process?

   Yes _____ No _____

6. Does this project require an amendment to the District's comprehensive plan?

   Yes _____ No _____

7. Has schematic design been reviewed with District Staff for configuration, vehicular access, slope, depth, other issues?

   Yes _____ No _____

8. Does this proposal conform to the District's design standards?

Yes _____ No _____

If no, have variances requiring District approval been reviewed and approved by District Staff?

Yes _____ No _____

9. District has reviewed application.

Comments:_____

_____

_____

Prepared by:_____

Accepted by:_____

Rejected by:_____

AUTHORIZATION LETTER

RE:

Dear Developer:

This letter shall acknowledge receipt of your deposit in the amount of $_____ for a developer extension agreement by the Birch Bay Water and Sewer District. Your deposit has been provided for the development known as:

By your signature at the bottom of this letter, you shall, on behalf of the developer and this development, authorize the District to expend such monies as may be necessary for preliminary engineering and legal fees for this developer extension. You, on behalf of the developer, further acknowledge and authorize the District to satisfy such obligations with the deposit herein provided, prior to execution of the Developer Extension Agreement.

Very truly yours,

General Manager
Birch Bay Water and Sewer District

Read and Approved:

_____
Developer or Property Owner

After Recording Please Return To:

Attn:
Birch Bay Water and Sewer District
7096 Point Whitehorn Road
Birch Bay, Washington 98230-9675
(360) 371-7100

Document Title(s): Developer Extension Agreement

Reference Number(s) of Documents Assigned or Released: N/A

[ ] Additional on page _____ of document.

Grantor(s): (Print Last name, First name, and Initials)

1._____
2._____
3._____

[ ] Additional on page _____ of document.

Grantee(s): Birch Bay Water and Sewer District

Legal Description (abbreviated: i.e. lot, block, plat of section, township, range):

_____

[X] Additional legal description is on page two of document.

Assessor's Property Tax Parcel / Account Number:_____

[ ] Additional Parcel Numbers for additional legals are on page ___ of document.

BIRCH BAY WATER AND SEWER DISTRICT
Whatcom County, Washington

DEVELOPER EXTENSION AGREEMENT

SEWER

This Developer Extension Agreement ("Agreement") is entered this _____ day of _____, _____, by and between _____("Developer") and _____, ("Owner") (together referred to as "Developer/Owner"), and the Birch Bay Water and Sewer District in Whatcom County, Washington (hereinafter the "District"). By signing this Agreement, Developer hereby requests permission from the District to construct and install an extension in the public right-of-way under the District's franchise therefore, and/or on easements which are subject to the approval of the District.

1. LOCATION AND EXTENSION

The proposed extension will be installed in roads and/or easements and/or on other approved rights-of-way and shall be for the use and benefit of the property hereinafter legally described as follows:

Legal Description of Property:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The above described property is hereafter referred to as the "Property."

2. DESCRIPTION OF EXTENSION AND OWNERSHIP

The proposed extension will consist of approximately _____ lineal feet of sewer pipe and appurtenances (hereafter "Project" or "Project extension"), and shall be installed in accordance with plans and specifications approved by the District, in accordance with the standards and conditions for constructing extensions to the sewer system adopted by the Board of Commissioners of the District, and the conditions approved by the Board of Commissioners of the District for service to

the Property per the developer extension application review process, the terms and conditions of which are attached hereto and made a part hereof.

The Owner represents, guarantees and warrants that he/she/it is the owner of the "Property."

3. FEES AND CHARGES

A. Unless otherwise agreed herein, all costs incurred by the District on this project shall be borne by the Developer/Owner. The Developer/Owner shall deposit a fee (the Project Deposit) which shall be determined by the District after review of application. The fee shall be payment for all costs to be incurred by the District for inspection, engineering, legal, financial or any other services performed by or for the District relating to this Project. Developer/Owner shall pay the District for staff hourly wages and benefits for work performed by District staff on the Project, plus an overhead fee. The overhead fee shall be calculated pursuant to District Code Section 2.24.010 and is subject to change without notice during the term of this Agreement. An administrative overhead fee of five percent (5%) shall be added to all fees charged by outside professional or other services. The Developer/Owner shall be responsible for the payment of all such costs incurred by the District prior to Final Acceptance by the District and for two years thereafter. The meaning of the term "final acceptance" as used in this Agreement is set forth in Section 15 herein.

B. The fee is retained for two years after Final Acceptance, at which time any remaining unexpended fee will be returned to the Developer/Owner.

Sewer General Facilities Charge – The Developer/Owner shall pay the District's General Facilities Charge for sewer service facilities in the amount currently established at District Code Section 8.08.050 for each equivalent living unit (ELU) to be located on the Property, as defined at District Code Section 8.04.010 and any amendments thereto. The Developer/Owner shall not be subject to increases in the General Facilities Charge until expiration of the two (2) year term of this Agreement or until completion and acceptance of the Project, whichever occurs first.

Should the General Facilities Charge be increased, before or after completion and acceptance of the Project, but prior to actual connection to the system and commencement of monthly service payments to the District, the property owner at the time of connection to the system shall be subject to such increased General Facilities Charge and shall pay the difference to the District between the General Facilities Charge previously paid to the District and the General Facilities Charge currently in effect at

the time of connection. This sum shall be paid prior to the District providing service.

The General Facilities Charge reimburses the District for a pro rata share of the cost of the general system required to furnish District-wide service. Such system consists of both existing facilities constructed and future facilities to be constructed as identified in adopted District plans.

The District will allow a credit against the General Facilities charge to any Developer/Owner who is required to install General Facilities. Such credits include but are not limited to the difference between the cost of ten inch (10") diameter lines and any such larger lines that the District may require the Developer/Owner to install.

Payment of one-half (1/2) of the total General Facilities charges due for the Project shall be made by Developer/Owner before Project construction begins.

Payment of the remaining one-half (1/2) of the total General Facilities charges due for the Project shall be made by Developer/Owner prior to the District's final acceptance of the Project.

C. Prior to commencement of Project construction, the District may, at its sole discretion, require the Developer/Owner to submit for District approval, a Project Estimate (Exhibit A hereto) identifying the estimated cost and funding source for each Project element. If applicable, the Project Estimate shall specify which Project elements are General Facilities and which Project elements are to be subject to the Reimbursement Agreement herein. The parties recognize that the actual costs of construction may vary from the Project Estimate and that the Project Estimate is to be used as a guide for development of the Reimbursement Agreement herein and determination of fees and charges during Final Acceptance.

D. System isolation deposit - Prior to commencement of Project construction, a $1,000 system isolation deposit shall be paid to the District. The isolation device shall be in place and inspected by the District prior to the start of construction. It shall remain in place and be functional during construction and shall not be removed without the authorization of the District. If the above stipulations are not adhered to, the $1,000 deposit shall be forfeited.

4. PAYMENT - SECURITY OF FEES

The Project Deposit identified in Item 3.A. above shall be paid by the Developer/Owner to the District as follows:

A. One-half (1/2) of the fee at the time the Agreement is made.

B. Second one-half (1/2) of the fee shall be paid before Project construction begins.

C. Any fees or charges incurred by the District for the Project that are not covered by the Project Deposit, shall be paid in full prior to final acceptance of the Project by the District.

5. PRELIMINARY ENGINEERING

A. The Developer/Owner may have his own professional engineer prepare plans and specifications for sewer lines or the Developer/Owner may have the District's engineer prepare said plans and specifications.

B. The Developer/Owner shall furnish two (2) copies of the proposed plat map to a scale of 1 inch = 100 feet or 1 inch = 50 feet with contour intervals of 5 feet or less, and proposed road profile sheets prior to the District's ordering of engineering design or plan review from its engineer. Final plat map shall be furnished as soon as possible. The Developer/Owner shall also provide the description, location and elevation of all bench mark data available on the project site and this information, wherever possible, shall be indicated on the maps furnished by the Developer/Owner. The datum used shall be the District's and not an assumed datum.

C. The District recommends pump station and pump system plans and specifications be prepared by the District.

6. DESIGN AND CONSTRUCTION

A. The design and construction of the sewer lines shall be subject to standards of design and construction set forth in the District's "Developer Project Manual" and other related standards, as interpreted by the District.

B. The Developer/Owner acknowledges receipt of the District's "Developer Project Manual," the contents of which are hereby incorporated as part of this Agreement.

C. The District reserves the right to update the design and construction standards set forth in its "Developer Project Manual" at any time and to require changes in Developer/Owner's plans before or after their approval. The Project shall also comply with Washington State Department of Health and Washington State Department of Ecology design standards and requirements

D. The District Engineer retains exclusive and sole authority to determine when the Developer/Owner's Engineer complies with the design and construction standards set forth in the District's "Developer Project Manual." The District Engineer is the final design approval authority and the Developer/Owner shall not commence construction until the District Engineer approves the design and the Developer/Owner receives a notice to proceed. It is the Developer/Owner's responsibility to ensure that the plans prepared by his or her engineer conform in all respects to District standards. Any failure by the District to discover errors, omissions, or discrepancies in the plans shall not relieve the Developer/Owner of this responsibility.

E. The District will make available to the Developer/Owner information it knowingly has in its possession regarding existing utilities and obstructions. Such information, however, is not guaranteed to be complete or accurate. Developer/Owner is responsible for conducting his or her own independent investigation and review of nearby existing utilities and potential obstructions. Developer/Owner agrees that the provision of incomplete or erroneous information by the District shall not be the cause of liability against the District or its consultants, nor shall it relieve the Developer of responsibility for reporting any damage its activities may cause to other utilities.

7. EVIDENCE OF INSURANCE

See Section 15 of the General Conditions (Section 00700 of the Developer Project Manual) for insurance requirements.

8. BONDS

A. PERFORMANCE BOND. Prior to the beginning of construction, the Developer/Owner or the Developer/Owner's contractor shall provide to the District, at the Developer/Owner's expense, a performance bond in penal sum equal to the cost of all labor, materials and equipment, including Washington State sales tax, necessary to complete the work within the public right-of-way, conditioned upon the performance by the Developer/Owner of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon the prompt payment by the Developer/Owner to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. See Section 16 of the General Conditions (Section 00700 of the Developer Project Manual) for further information on performance bond requirements. The bond shall be in a form acceptable to the District.

B. MAINTENANCE BOND. In addition to the performance bond required by paragraph 8A herein, the Developer/Owner shall provide a maintenance bond in an amount equal to fifteen percent (15%) of the cost of the Project, but in no event less than two thousand dollars ($2,000.00). The maintenance bond shall guarantee that the sewer system transferred to

the District by bill of sale shall remain free of defects and in proper working order for a period of two (2) years from the date of final acceptance of the Project improvements by the District and shall be in a form acceptable to the District.

C. The District may accept a refundable cash deposit, assignment of savings or irrevocable letter of credit in lieu of the performance bond and/or maintenance bond, so long as the operative terms and conditions of the deposit, assignment of savings or irrevocable letter of credit are the same as those for performance and/or maintenance bonds as provided in paragraphs 8A and 8B and Section 16 of the General Conditions. The assignment of savings or irrevocable letter of credit shall be with a U.S. based financial institution and said account shall be insured by the Federal Deposit Insurance Corporation ("FDIC") for up to Two Hundred Fifty Thousand Dollars ($250,000.00). The assignment of savings or irrevocable letter of credit shall be in a form acceptable to the District. The District shall release the bond, assignment of savings, refundable cash deposit or irrevocable letter of credit, as appropriate, on satisfactory completion of the construction contract or completion of the warranty period and satisfaction of all obligations thereof.

9. SPECIAL CONDITION AND INDEMNFICATION

This Agreement is conditioned upon Whatcom County's determination, and the determination of any authorized body reviewing Whatcom County's determination, that the provision of water and/or sewer service pursuant to this Project complies with the Washington State Growth Management Act, Chapter 36.70A RCW. The Developer/Owner agrees to indemnify and hold harmless the District from any and all claims, suits, actions, or administrative proceedings, and any liability, loss or damage of any kind or nature, including legal defense costs and fees, based upon any such actual or alleged violation.

10. EASEMENTS

The Developer/Owner shall provide the District with all required easements at its sole cost, regardless of any changes to Project design, together with evidence of title, all subject to approval of the District. The easement legal description shall be prepared by a licensed professional surveyor and shall bear his seal. The District Engineer will place the easement on the proper form acceptable for recording with the county auditor, with the District as Grantee, and it will be returned to the Developer/Owner for signature. Where applicable, the Developer/Owner shall provide an easement compatible with the District's Comprehensive Sewer Plan to insure continuation of the sewer line. At the completion of construction and prior to the District accepting the sewer extension, a final signed easement shall be delivered to the District by the Developer/Owner.

Easements required for intervening properties shall be obtained by the Developer/Owner prior to construction start. All easements shall be granted to the District; plat general dedicated easements are not acceptable.

Developer/Owner shall provide a title insurance policy establishing clear title in grantor of the easement to the District in a sum not less than $1,000.00 per 500 lineal feet of the easement.

11. PERMITS AND COMPLIANCE

All the necessary permits (with the sole exception of the County Revocable Encroachment Permit for work in the County right-of-way) shall be obtained by the Developer/Owner. Developer/Owner shall bear sole responsibility for compliance with all local, state and federal laws applicable to Project construction. The District shall be provided with a copy of all applicable permits before construction begins. Construction shall proceed in accordance with all permits, approvals, and other governmental requirements, including without limitation the Whatcom County Development Standards and other District requirements. The District reserves the right to cancel, terminate, suspend, or not renew or extend this Agreement in the event that the Developer/Owner, or the agents thereof, are not in compliance with this Agreement, the District's "Developer's Project Manual," the terms of any permits or approvals, the Whatcom County Development Standards, or any other government requirements.

12. GRADING OF ROADS

Developer/Owner shall grade all roads to the design subgrade elevation prior to the start of construction and shall advise the District in writing of any changes which may be contemplated during construction. If the Developer/Owner changes the subgrade elevation of the road after completion of the extension, or any part thereof, the Developer/Owner shall be responsible for all costs incurred for the extension as a result of said change in subgrade elevation. This obligation shall remain in full force until Whatcom County or other municipality releases the right-of-way or road construction bond or bond of other description in connection with the Developer/Owner's obligation for completion of the roads within the area.

13. WATER

The District shall supply flushing water (approximately two fillings of the pipe system) for the Developer/Owner's project. Water for excessive flushing or other purposes such as settling and dust control shall be purchased by the Developer/Owner from the District at the current cost established by the District for this purpose.

14. MAINTENANCE OF CORRECT GRADES

The Developer/Owner shall maintain the design slope between manholes and shall check all intermediate grade stakes by means of a taut grade wire between at least three intermediate grade stakes. The use of a laser for maintaining pipe slope does not preclude the use of grade stakes or the checking of said stakes. In the event that the grade stakes do not line up, the work shall be stopped until the situation is corrected. The Developer/Owner shall make certain that all sewer slopes toward the connection to the existing sewer and that all sewers run at a constant grade and alignment between manholes. The Developer/Owner shall confirm that the sewer main is installed at a slope no less than that indicated on the approved plans, unless approved by the District.

15. CONNECTION TO THE DISTRICT'S SYSTEM

Not less than 48 hours prior to the time that said Project is partially or fully completed and connection to the District's System is desired, written application for permission to make the actual connection at a specified time shall be made by the Developer/Owner. All new connections to the existing system and all testing of the new line shall require authorization of the District and shall be conducted in the presence of the District's representatives. A tightline bypass or grouted plug shall be used at the connection point to the existing sewer.

16. FINAL ACCEPTANCE

The District agrees to accept title to the Project extension, subject to the terms herein, when all work has been completed and when the District has made final inspection and given approval of the system as having been completed in accordance with the plans and specifications. Final acceptance of said Project extension shall be by motion or resolution of the Board of Commissioners; provided that, if by motion the vote shall be recorded in the minutes of the meeting. The Project extension shall only be eligible for Final Acceptance after District receipt of a completed and executed bill of sale; easements; maintenance bond, cash deposit, assignment of savings or irrevocable letter of credit and all other documents required pursuant to this Agreement. Payment in full of all fees and charges and execution of any applicable Reimbursement Agreement shall also be required prior to Final Acceptance.

Within ninety (90) days following Final Acceptance, the Developer/Owner may elect to connect lots within the Property to the District's system. Connection shall be effected by paying any General Facilities Charges owing and by commencing and continuing payment of monthly charges for the lot. After ninety (90) days following Final Acceptance, no lot within the Property will be allowed to connect unless such connection occurs in conjunction with a building permit.

17. BILL OF SALE

Developer/Owner agrees to execute a bill of sale approved by the Attorney for the District within sixty (60) days of the approved and completed Project extension. Said bill of sale will provide for transfer of title of the constructed Project extension from the Developer/Owner to the District and will further include the following items, statements, and warranties for the benefit of the District:

A. Cost including administration, legal and engineering fees, for the sewer main installation.

B. The Developer/Owner will warrant (1) that he is the lawful owner of said Project extension and that he has the right to transfer title; (2) that the Project extension is free from all encumbrances; (3) that all bills for labor and material, and all taxes, have been paid, and Developer/Owner has provided a certificate or statement from Developer/Owner's Contractor and Engineer, each acknowledging they have been paid in full; (4) that all laws, regulations, and ordinances pertaining to construction of the Project extension have been complied with; and (5) that there are no lawsuits pending involving the Project. Developer/Owner will agree to hold the District harmless from and to defend all claims and demands made against the District which implicate any of the above warranties for a period of one (1) year from the date of the bill of sale.

C. The Developer/Owner will warrant that the Project extension is in proper working order, condition and repair, and is fit for its intended purpose and has been constructed in accordance with District standards.

D. The Developer/Owner will warrant that for a period of two (2) years from the date of final acceptance of the Project extension, said extension and all parts thereof shall remain in proper working order, condition and repair; and the Developer/Owner shall repair or replace, at Developer/Owner's expense, any work or material which may prove defective during the warranty period.

E. Consideration will be recited that Developer/Owner grants the Project extension to District for the consideration of incorporating the system in the overall sewer system of the District.

18. REIMBURSEMENT AGREEMENT EXECUTION AND RECORDING

Following completion of Project construction, execution, delivery and receipt of a bill of sale, maintenance bond, necessary easements and all other required documents, and payment in full of all fees and charges, and Final Acceptance of the Project extension by the District, the parties will, only if applicable, enter into a Reimbursement Agreement at the request of the Developer/Owner, in the form

and pursuant to the terms set forth in the Reimbursement Agreement form that is attached (only if applicable) as Exhibit "B" to this Agreement. The Developer/Owner shall submit to the District all contracts and costs related to the Project. The District's Engineer will determine the benefit area of the Project and verify the costs eligible for reimbursement. If the District determines that no benefit area per Title 57 RCW exists, then no Reimbursement Agreement will result. The Reimbursement Agreement must be signed and notarized by the Developer/Owner prior to Final Acceptance. The District will record any such Reimbursement Agreement with the county auditor at the Developer/Owner's expense. Requests by the Developer/Owner to establish a Reimbursement Agreement after the District's Final Acceptance will not be considered.

19. RESPONSIBILITY FOR PROJECT MANAGEMENT

The Developer/Owner shall be responsible for project management and coordination. Project management includes but is not limited to overall project coordination, utility and road locations and elevations and conflicts of same.

20. DURATION OF AGREEMENT; LIMITATION OF PERIOD FOR ACCEPTANCE

The Project extension shall be complete and accepted within two years of the date of acceptance of this Application by the District. If the extension is not completed and accepted within two years from the date below, this Agreement shall be deemed terminated, unless and until Developer/Owner shall make a new Agreement or District consents to the extension of the existing Agreement and Developer/Owner pays any and all District costs associated with such new or extended Agreement, all as determined by the Board of Commissioners.

21. BREACH OFCONTRACT – ATTORNEY'S FEES

A breach of any provision of this Agreement shall constitute a total breach hereof, and shall subject the Developer/Owner to cancellation of the Agreement, forfeiture of deposits, and a claim for other relieve as allowed by law. In the event of litigation regarding the terms or performance of this Agreement, the substantially prevailing party shall be entitled to an award of reasonable attorney's fees and costs.

22. NO THIRD PARTY RIGHTS CREATED

This Agreement is made entirely for the benefit of the District and the Developer/Owner. No third party shall have any rights hereunder, whether by agency or as a third party beneficiary, or otherwise.

23. COMPLETE AGREEMENT

This Agreement constitutes the entire agreement between the Developer/Owner and the District. This Agreement may be modified in writing only, upon mutual agreement of the parties.

24. JOINT AND SEVERAL LIABILITY

Each and every person or entity party to this Agreement as "Developer" and/or "Owner" shall be jointly and severally liable for performance of the obligations in this Agreement. The District shall have the right to full performance of this Agreement from each and every person identified as "Developer" and/or "Owner" without regard to the respective obligations that such persons or entities may have to each other. The joint and several liability of all persons and entities identified as Developer and/or Owner for performance of the obligations herein is a material part of this Agreement.

25. SALE OF PROPERTY PRIOR TO PROJECT COMPLETION

This Agreement shall be binding upon the successors and assigns of the parties and shall run with the land until completion of the project.

Dated this _____ day of _____, _____.

DEVELOPER

_____

BIRCH BAY WATER & SEWER DISTRICT

By _____
Secretary, Board of Commissioners

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

Print Name:_____
NOTARY PUBLIC
My commission expires: _____

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal this _____ day of _____, 20__.

Print Name:_____
NOTARY PUBLIC
My commission expires: _____

STANDARD FORMS FOR

EXHIBIT A – FINANCIAL RESPONSIBILITY ALLOCATION

and

EXHIBIT B – REIMBURSEMENT AGREEMENT

Are included in Section B

BIRCH BAY WATER AND SEWER DISTRICT
Whatcom County, Washington

DEVELOPER EXTENSION CHECKLIST - SEWER

LOCATION: _____

PROJECT: _____ PHONE: _____

DEVELOPER/OWNER: _____ PHONE: _____

ENGINEER: _____ PHONE: _____

CONTRACTOR: _____ PHONE: _____

		DATE	AMOUNT
A.	APPLICATION		
1.	Preliminary plans submitted to District.	_____	
2.	Developer Project Manual obtained by Developer.	_____	
3.	Application submitted to District.	_____	_____
4.	Fees Paid: $500 Application Review Fee	_____	_____
5.	District review and approval of application.	_____	_____
6.	Board hearing if application is rejected by Commissioners.	_____	
7.	Forward information for Agreement .	_____	
B.	PRELIMINARY		
1.	Agreement completed by Developer.	_____	
2.	Preliminary plan submitted to District by Developer.	_____	
3.	SEPA/Shoreline compliance submitted to District by Developer.	_____	

4. Agreement approved by Board of Commissioners. _____

C. BEFORE PLAN REVIEW OR DESIGN

1. Fees Paid: One-half (1/2) of fee (See Agreement - Item 3A) paid by Developer. _____

2. Preliminary plat provided by Developer. _____

3. Contour map submitted to District: Scale 1" = 50' or 1" = 100' horizontal and 1" = 5' or 1" = 10' vertical. _____

4. Road/Stormwater profiles provided by Developer. _____

5. Plans submitted to District for review _____

6. Notice to proceed to District's engineer. _____

D. REQUIRED BEFORE CONSTRUCTION BEGINS

1. Plans and specifications approved by District and letter sent to Developer. _____

2. Plans and specifications sent to Whatcom County Public Works Department by District. (County Roads) _____ _____

3. Approval of Contractor by District. _____

4. Performance Bond or other security submitted by Developer. _____ _____
Cash deposit in lieu of Performance Bond (optional). _____

5. Certificate of Insurance, Insurance Questionnaire and all endorsements submitted by Developer. (Asbestos insurance required/provided?) _____

6. Revocable encroachment permit (County roads) obtained by District. _____ _____

7. Other State, County, and/or Federal permits acquired by Developer. _____

8. Material and equipment list submitted by Developer. _____

9. Preconstruction meeting held by Developer. (Minimum 7 days notice required for scheduling). _____

10. Construction stakes in place and cut sheets to District by Developer a minimum of 2 days prior to construction. _____

11. Property boundary stakes in place by Developer. _____

12. Third party easements secured and submitted to District by Developer. _____ _____

13. Fees Paid: Additional one-half (1/2) of fee (See Agreement - Item 3A) paid by Developer. _____ _____

14. Fees Paid: One-half (1/2) of sewer connection charge paid by Developer. _____ _____

15. Fees Paid: $1,000.00 system isolation deposit. _____ _____

16. Plug or tightline bypass inspected and approved. _____ _____

E. CONSTRUCTION

1. District approves construction start. _____

2. District releases cut sheets. _____

3. District inspects project. FROM: _____ TO: _____

4. Air test, lamp, mandrel and video inspection completed and passed. _____

5. Punch list submitted to Contractor and Developer. _____

6. Punch list items inspected and revised punch list submitted to Contractor and Developer if necessary. _____

7. Final inspections and approval. _____

8. Letter to Developer requesting as-builts, easements, approved plat and bill of sale. _____

9. Memo to file that project is "construction complete". _____

F. REQUIREMENTS BEFORE SIDE SEWER CONNECTION

1. As-builts, easements, and on-from-to submitted to District for review. _____

2. As-builts and easements returned to Developer's Engineer for revisions, if necessary. _____

3. As-builts, easements and bill of sale exhibit approved _____

4. Easements signed by Developer and returned to District. _____

5. Bill of Sale and Certification of Costs executed and returned to District. _____

6. Easements sent to County for recording. _____

7. District pays payback amount to proper parties, if necessary. _____ _____

8. District authorizes system tie-in. _____

9. District issues side sewer permit. _____

10. District refunds system isolation deposit. _____ _____

11. District inspects and approves system tie-in and side sewer. _____

G. AFTER CONSTRUCTION

1. Execution and recording of payback agreement by District. _____ _____

2. Easement restoration releases sent to property owner (if required). _____

3. Contractor performs additional work on easement restoration, if necessary. _____

4. Easement restoration releases signed and submitted to District. _____

5. Project cost submitted to District Treasurer for inclusion in Plant-in-Service. _____

6. 1/4 section(s) and general map revised. _____

7. Pick up billing on A/R. _____

8. Developer expenses brought current and paid. _____

9. Fees Paid: Remaining one-half (1/2) of sewer connection charge paid. _____ _____

10. Execute maintenance bond by Developer, if required. _____

11. Release of performance bond (or cash deposit) by District. _____

12. Begin two- (2) year warranty period. _____

H. FINAL ACCEPTANCE

1. 11- and 23- month warranty inspection completed by District. _____

2. Developer makes warranty corrections, if necessary. _____

3. District makes final acceptance. _____

4. Release excess fee to Developer by District. _____ _____

5. Release of maintenance bond by District. _____ _____

6. Letter sent to Developer stating project has been completed. _____

BIRCH BAY WATER AND SEWER DISTRICT

DESIGN AND CONSTRUCTION STANDARDS - SEWER

1. GENERAL

All extensions to the sewer system must conform to the design standards of the District. In general, the Developer is required to construct the sewer lines through his property in order to allow for future extension, expansion and continuation of the District's collection system and/or for conformance with the Comprehensive Sewer System Plan. The following items are necessary to meet the conditions.

The District and its consultants do not insure the correctness of the information supplied to the Developer from the District's records. The Developer shall verify by survey any information provided by the District prior to using the information in design or construction.

A. Plans and Specifications

The installation of sewer extensions shall be made in accordance with these Conditions and Standards. The scale shall be: horizontal 1" = 50" or other scale as appropriate for the specific project, subject to the approval of the District; vertical 1" = 5' on 22" x 34" mylar. The minimum text height shall be 0.12 inch. The plans shall be sealed by a Professional Engineer licensed in Washington. Enclosed is a sample plan showing a typical sewer design. Drafting of plans for the District shall conform to this example. The sewer extension shall be shown on a sheet separate from the sewer, storm drainage and roadway plans. If the project is part of a phased development, a plan of the entire development shall be included, with the current phase clearly indicated.

The construction plans shall be reviewed or prepared by the District's Engineer. The developer shall submit three (3) sets of plans for review by the District. When the plans have been determined to meet the District standards, then a final set of reproducible plans shall be submitted to the District. These reproducible plans shall receive the Districts "Plan Review" approval stamp. The District shall submit the plans to the regulatory agencies for approval. After approvals have been received, a set of plans stamped "Issued for Construction" shall be made available to the developer.

When the Contractor completes the mainline sewer work and the manholes have been adjusted to the finish grade, the mylars of the sewer plans shall be revised to conform with construction records, and then sent

to the District. Prior to submitting revised plans, manhole inverts and horizontal alignment shall be verified by a professional land surveyor. Photomylars are required for the District record drawings.

B. Right-of-Way and Monuments

All existing rights-of-way in which the sewer extension is to be made shall be improved prior to preparation of construction plans and installation of the sewers. Permanent private easements shall be not less than twenty feet (20') in width. Public rights-of-way shall be cleared, grubbed and graded in accordance with the requirements of Whatcom County. Monuments disturbed or destroyed shall be replaced at the Developer's expense.

2. DESIGN STANDARDS

A. Unless otherwise called for by the District on the plans or standard provision in the Technical Specifications, gravity sewers shall be constructed of PVC pipe.

Plastic-PVC	ASTM D3034-SDR 35 or F789
Ductile Iron (Polyethylene Encased)	AWWA C151
Concrete	ASTM C-14 Class 2

B. Manholes shall be precast, shall be 48" I.D. in accordance with the specifications and Detail Nos. 13 and 14 and shall conform to ASTM C478. Manhole frames and covers shall be locking type in accordance with the specifications and Detail No. 12 and shall be supplied with stainless steel allen head cap screws.

C. Pressure mains shall be ductile iron, high density polyethylene (HDPE), or PVC, of a pressure class suitable for the anticipated working and surge pressure.

D. All joints for sewers or pressure mains shall be of the rubber gasket type for ductile iron or PVC pipe, or butt-fusion for HDPE pipe.

E. The sewer system extension shall be sized and routed to meet the following criteria:

i. Provide sewer line to serve all the frontage of all lots or structures in the proposed development, so as to limit the length of side sewers to 150 feet.

ii. Connect between the sewer system in the proposed development and the District's existing sewer collection system and in the manner indicated by the District.

iii. Extend sewer line through the property for potential future connection or extension in accordance with the District's Comprehensive Sewer System Plan or as required by the District.

iv. Pipe diameter shall be minimum of 8 inches, or larger as required for future service in accordance with District's Comprehensive Sewer System Plan.

F. Minimum grade for 8-inch mains shall be 0.50% and the minimum grade for sewer mains that will not be extended shall be 0.75%, unless otherwise approved by the District. Minimum grade and design criteria, unless District criteria is more stringent, shall be in accordance with "Criteria for Sewage Works Design", Washington State Department of Ecology (DOE); latest edition. However, grades between 0.40% and 0.50% may be approved by the District for use on non-terminal 8-inch sewer runs if topographic or other conditions prevent use of the minimum slope. If a slope of less than 0.50% is approved, the sewer must be constructed at no less than minimum slope approved. Slopes shall be expressed to two decimal places if shown as a percentage, or to four decimal places if expressed as a ration (i.e., feet of rise per feet of run). DOE-minimum slopes for sewer mains larger than 8-inch diameter may only be used upon approval of the District.

G. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 400 feet. Manholes shall be a minimum of six (6) feet deep, and shall be seven (7) feet deep where possible, and shall be used at the termination of each sewer, unless otherwise approved by District. Joints on manhole sections shall be rubber gasket type and shall be externally sealed per the Details and Specifications.

H. The grade for 6" side sewer stubs shall be a minimum of two percent (2%).

I. A tight line by-pass shall be required to separate existing flows from the new connection, until final acceptance of the sewer extension. A grouted in-place plug shall be required at the connection of a new system to a dead end existing manhole, until final acceptance of the sewer extension.

J. Sewer lines shall generally be located five (5) feet on either side of centerline, in accordance with Whatcom County Development Standards.

K. Terminal manholes where future connection/extension may occur shall not be channeled. A grouted bottom sloping to the outlet shall be constructed.

L. Pump stations shall have at least two submersible wastewater pumps with a standby power generator and telemetry system. All equipment shall meet the requirements and approval of the District.

M. All-weather vehicular access suitable for use by District sewer maintenance vehicles, and access right of way or easement granted to the District, shall be provided to all manholes and/or cleanouts on the public sewer extension, unless waived by the District.

3. EASEMENTS

Legal descriptions for easements to be dedicated to the District for all portions of the sewer system which lie outside of public street right-of-ways shall be signed and stamped by a professional land surveyor and transmitted to the District. Easements shall be twenty (20) feet in width, or as required by the District. An easement may coincide with another utility easement, except that all sanitary sewer lines must be ten feet or more from waterlines and other utilities must be a minimum of five feet from the sewer lines. Sewer shall be located no closer than ten (10) feet from the easement edge. There shall be a separate easement provided for each lot that a sewer line crosses. These easements are required by the District regardless of easements recorded with property deeds or plats.

Easements must be approved by the District prior to sewer service connection.

4. CONSTRUCTION AND INSPECTION

A. Installation and Inspection

No work on the sewer system shall be performed without a District Inspector being present. The District may refuse acceptance of any portion of the work installed without the Inspector having reviewed the work. The District must be notified a minimum of two full working days in advance of a firm starting date and time to arrange for and schedule the Inspector. Work must proceed in a continuous manner. If there are breaks in construction, there must be two working days notice before beginning work again.

The Developer or Contractor shall furnish cut sheets to the Engineer for review two work days prior to the start of construction. Cut sheets shall include offset hubs at manholes (new and/or existing) and at 25’ and 50’ upstream of manholes (unless the distance to the next manhole is shorter) and every 100 feet thereafter. Construction shall not commence

until Contractor has received the cut sheets stamped “issued for construction” from the Engineer.

The approved construction plans and specifications shall be followed. No deviations will be allowed without request for change and approval received from the District. The District reserves the right to order changes in the event of conditions or circumstances discovered during construction; such changes could result from the ability or care shown by the Contractor, natural and man-made conditions, or any other reason.

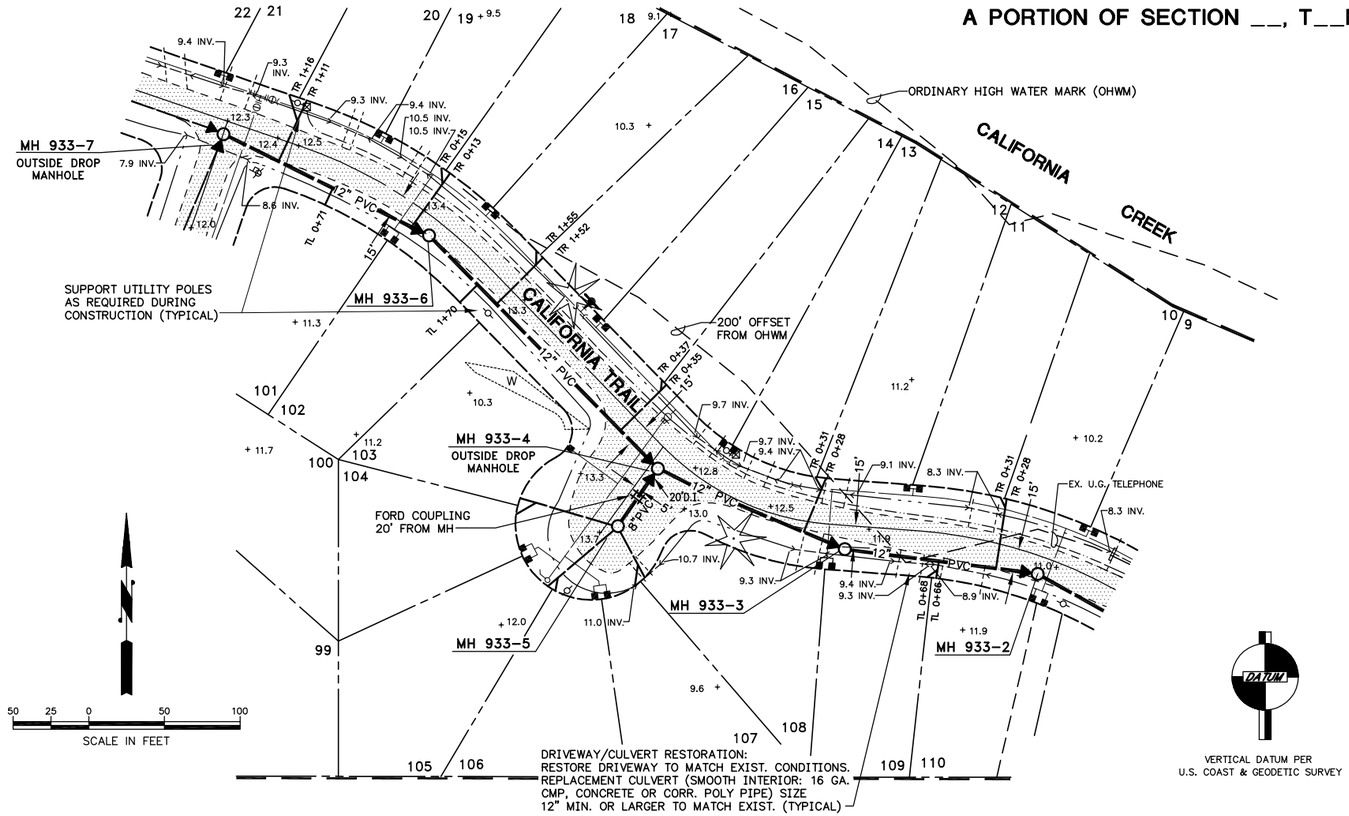
The Contractor shall exercise extreme care in checking and cleaning all pipes and fittings of dirt, debris, and/or any foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal system installed when it is to be left for any period of time, including lunch breaks, coffee breaks, and overnight. Pipe and fittings will be cleaned before installation if contaminated by dust, smoke, exhaust or any other material. Material contaminated by petroleum products or questionable chemical will be rejected. No trench water is to be allowed to enter installed system.

All connections to existing District mains and manholes must be performed while the District Inspector is present.

B. As-Built Drawings

When the Contractor completes the sewer system work, the mylars of the sewer plans shall be revised to conform with construction records, and then sent to the District. Photomylars are required for the District’s record drawings. Prior to submitting revised plans, manhole and cleanout location elevation and horizontal alignment shall be verified by a professional land surveyor.

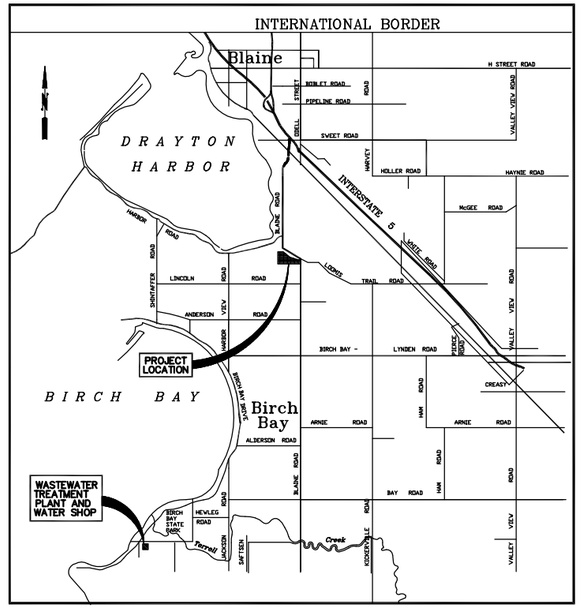
A PORTION OF SECTION __, T__N, R_E, W.M., WHATCOM COUNTY, WASHINGTON



VERTICAL DATUM PER
U.S. COAST & GEODETIC SURVEY

GENERAL NOTES

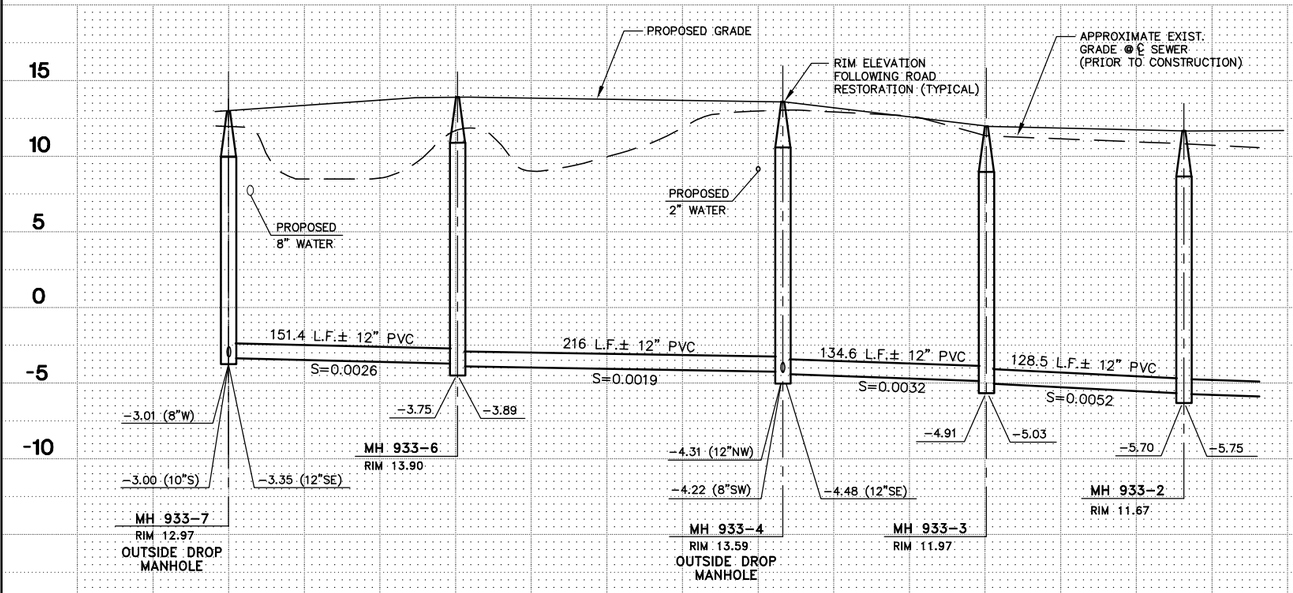
USE THE NOTES PROVIDED IN THE DEVELOPER MANUAL.

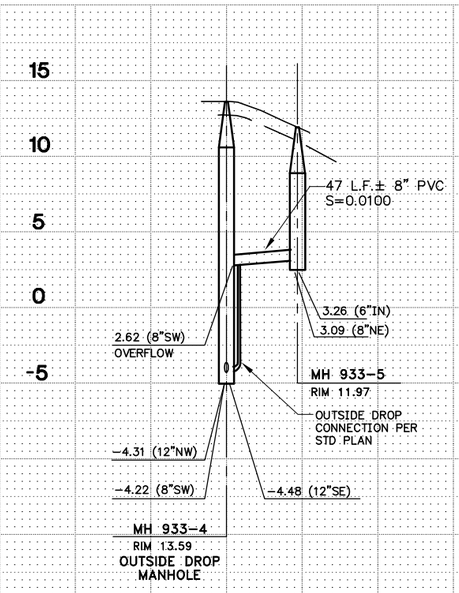


VICINITY MAP

NOT TO SCALE

CALL 2 BUSINESS DAYS BEFORE YOU DIG 1-800-424-5555





LEGEND

- EXISTING WATER SERVICE
- EXIST. UTILITY POLE
- EXIST. ROAD SIGN
- EXIST. TREES
- W — EXIST. WETLAND
- EXIST. UTILITY BOX
- SAMPLING STATION
- GRAVEL — EXIST. DRIVEWAY / ACCESS
- EXIST. ASPHALT PAVEMENT
- EXIST. DITCH LINE
- EXIST. FENCE LINE
- EXIST. SEWER LINE
- PROPOSED SEWER LINE
- EXIST. WATER LINE
- EXIST. PROPERTY LINE
- EXIST. RIGHT-OF-WAY LINE
- ORDINARY HIGH WATER MARK (OHWM)

No.	Date	By	Ckd.	Appr.	Revision

Approved By:

STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date	Checked By	Date
Designed By	Date	Approved By	Date

BIRCH BAY WATER & SEWER DISTRICT

Scale:
Horiz. 1"=50'
Vert. 1"=5'
Job No.

PROJECT NAME

SEWER PLAN & PROFILE

Sheet 1
Of 1
DE #

STANDARD GENERAL NOTES

1. **ALL WORK SHALL CONFORM TO THE RULES AND REGULATIONS OF BIRCH BAY WATER AND SEWER DISTRICT. THE STANDARD DETAILS AND SPECIFICATIONS ARE CONTAINED IN A BOUND VOLUME TITLED "DEVELOPER PROJECT MANUAL", INCLUDED HEREIN BY REFERENCE.**

2. **THE DISTRICT SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY BIRCH BAY WATER AND SEWER DISTRICT.**

3. **TYPICAL SIDE SEWERS TO BE 6 INCH MINIMUM PIPE DIAMETER TO THE PROPERTY LINE, INSTALLED AT A SLOPE NECESSARY FOR GRAVITY SEWER SERVICE TO THE PROPOSED BUILDING CONNECTION, BUT NOT LESS THAN 2.0%. SIDE SEWERS SHALL BE LOCATED ON OPPOSITE SIDE OF LOT FROM WATER SERVICES.**

4. **SEWER MAINS SHALL BE INSTALLED AT NO LESS THAN THE SLOPE INDICATED ON THE DRAWING, UNLESS OTHERWISE APPROVED BY THE DISTRICT.**

5. **A 1-1/4 INCH WHITE PVC PIPE, ASTM 2241 SDR 21 200 PSI. SHALL BE PLACED VERTICALLY AT THE END OF EACH STUB AND SHALL RISE 2 FEET ABOVE FINISH GRADE LEVEL. BOTH ENDS OF THE PVC PIPE SHALL HAVE CAPS GLUED ON AND THE PIPE INTERIOR KEPT CLEAN FOR THE PURPOSE OF FUTURE DEPTH MEASUREMENT.**

6. **LOCATIONS SHOWN ON EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON. SEE SECTION 02760 OF SPECIFICATIONS.**

7. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR HIS ENGINEER.

8. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND THREE (3) FEET VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SITUATIONS OCCURRING WITH LESS THAN MINIMUM SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH SECTION C1-9.1 OF THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, LATEST EDITION.

9. A PLUG SHALL BE PLACED IN THE OUTLET PIPE OF THE EXISTING MANHOLE WHICH IS TO BE CONNECTED TO OR THE OUTLET PIPE OF THE FIRST NEW MANHOLE CONSTRUCTED. THIS PLUG SHALL REMAIN IN PLACE AND MAY NOT BE REMOVED WITHOUT THE PERMISSION OF THE SEWER DISTRICT. REMOVAL WILL RESULT IN FORFEITURE OF SYSTEM ISOLATION DEPOSIT.

NOTICE:

CAUTION -- EXTREME HAZARD -- OVERHEAD ELECTRICAL SERVICE LINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. ELECTRICAL LINES SHOWN ON THE DRAWINGS ARE LOCATED BY POINT-TO-POINT, POWER-POLE-TO-POWER-POLE CONNECTION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND DETERMINE THE EXTENT OF HAZARD AND REMEDIAL MEASURES AND SHALL TAKE WHATEVER PRECAUTIONS MAY BE REQUIRED. SEE SECTION 02760 OF SPECIFICATIONS.

PERFORMANCE BOND

(Standard form included in Section B)

BILL OF SALE

(Standard form included in Section B)

EXHIBIT B
CERTIFICATION OF COSTS OF CONSTRUCTION
OF DEVELOPER EXTENSION (SEWER) CONVEYED TO
BIRCH BAY WATER AND SEWER DISTRICT

The undersigned is the Developer of the plat of _____ and has, pursuant to an agreement with Birch Bay Water and Sewer District dated the _____ day of _____, 20____, constructed certain sewer facilities which after connection to the sewer system of Birch Bay Water and Sewer District are to be conveyed to the District by the Developer.

In accordance with the terms of the said Developer Extension Agreement between the undersigned and Birch Bay Water and Sewer District, the undersigned hereby certifies that the costs of construction of the facility being conveyed to the District pursuant to said Developer Extension Agreement are as follows:

A.	Materials	$_____
B.	Labor	$_____
C.	Engineering	$_____
D.	Permits & Fees	$_____
E.	Other Costs	
	_____	$_____
	_____	$_____
	_____	$_____
	TOTAL COSTS OF CONSTRUCTION OF FACILITY	$_____

CERTIFIED TO BIRCH BAY WATER AND SEWER DISTRICT BY _____
(insert name of developer if an individual or corporation if a corporate developer)

BY _____, President

Corporate Seal (if required)

BY _____, Secretary

INDIVIDUAL ACKNOWLEDGEMENT:

STATE OF WASHINGTON)
)ss
COUNTY OF WHATCOM)

On this day, personally appeared before me _____, to me known to be the individual described in and who executed the within and foregoing instrument and acknowledged to me that he signed the same as his free and voluntary act and deed for the uses and purposes therein mentioned.

WITNESS my hand and official seal this _____ day of _____, 20___.

_____
NOTARY PUBLIC in and for the State of Washington,
residing at _____

MAINTENANCE BOND

(Standard form included in Section B)

ASSIGNMENT OF SAVINGS

(Standard form included in Section B)

11- AND 23-MONTH INSPECTION

Final inspection report for:

1. Name of Development _____

2. Contractor _____

3. Developer/Owner _____

4. Date of Inspection _____

5. Inspector _____

INSPECTION CHECKLIST:

a. Condition of Roadway: _____

_____

b. Condition of Sewer Main: _____

_____

c. Condition of Manholes: _____

_____

d. Any other utilities problems visible; water boxes, valve box, light poles, storm drains, etc.

_____

_____

e. What conditions need to be corrected in order to approve project. Use additional page(s), if necessary:

_____

_____

SECTION D

CONSTRUCTION/CONDITIONS/SPECIFICATIONS

CONSTRUCTION INFORMATION

Developers shall make themselves familiar with the Developer Project Manual. Developers who have not made themselves familiar with the manual have most commonly had problems in the following areas; this listing is not a substitute for reading and implementing the requirements of the Developer Project Manual.

1. "Performance Bond' and "Certificate of Insurance" with Endorsements and Insurance Questionnaire shall be turned into the District prior to construction. The Certificate of Insurance shall be completed as noted in Section 15 of the General Conditions. A sample copy of the Certificate of Insurance is also contained herein.

2. Connection to existing line - Connections shall be made in a way that debris and water from the construction site is kept from entering the existing system. See Sections 02605, 02660 and 02730 of Specifications. If a manhole is constructed over an existing line, the existing line shall not be broken without District authorization.

3. Isolate existing system - The existing system shall be protected using an isolation device (usually a plug). The isolation device shall be in place and inspected by the District prior to construction. The device shall remain in place and functional during construction. It shall not be removed until authorized by the District. If the above stipulations are not adhered to, the Developer will forfeit the $1,000 system isolation deposit.

4. Cut sheet - Cut sheets shall be given to the inspector two working days in advance of construction for the purpose of checking. All cut sheets used on the job site shall be issued through the District's inspector. Line and grade shall be checked at each hub. Cut sheets shall show cuts at the first 25 and 50 foot station out of the downstream manhole, then every 50 feet thereafter.

5. Notice to Inspector - The inspector shall be notified 2 working days in advance of construction. Where work is to be done on the weekend the inspector shall be notified in advance of such work.

6. Manholes - Joints between precast manhole sections shall be gasketed and externally sealed as specified. Safety steps shall be used. Manhole covers shall be as specified.

7. PVC Pipe - Bedding material is not clean pea gravel: bedding shall have sand content. Exact bedding material description is noted in Section 02222 of the Specifications. PVC pipe shall have a mandrel passed through it to check for any deflections in the pipe. The Contractor shall supply the mandrel and the District shall approve the mandrel and witness the test.

8. Side Sewers - 6 x 6 inch tees or wyes shall be installed at the end of each side sewer. Maximum slope for side sewers is 2-foot vertical to 1-foot horizontal and a minimum slope is 2 percent. Side sewer locations shall be marked as noted in Section 02730. No side sewer shall be covered without being inspected. Where the service is to be provided to individual lots, property corners shall be staked.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

	CONTACT NAME:
	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A :	
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** 74424315 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☒ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	☐ OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
	☐ **UMBRELLA LIAB** ☐ OCCUR						EACH OCCURRENCE	$
	☐ **EXCESS LIAB** ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
	Professional Liab;Claims Made						Per Claim Aggregate	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

SECTION 00650
INSURANCE QUESTIONNAIRE

**NOTE: THIS QUESTIONNAIRE MUST BE COMPLETED AND ATTACHED TO CERTIFICATE OF INSURANCE

Contractor: _____
Project: _____
Ref. #: _____
Owner: _____

Are the following coverage's and/or conditions in effect?

	YES	NO
The Policy form is ISO Commercial General Liability (CGL) form CG 00 01 or CG 00 02 (circle one). If NO, attach a copy of the policy with required coverage's clearly identified	_____	_____
(CGL) Ongoing Operations coverage (similar to CG 20 10 10 01, CG 20 10 07 04, or equivalent)	_____	_____
	_____	_____
(CGL) Products and Completed operation coverage (similar to CG 20 37 10 01, CG 20 37 07 04, or equivalent)	_____	_____
Cross Liability clause (or equivalent wording)	_____	_____
Personal Injury Liability coverage (with employee exclusion deleted)	_____	_____
Broad Form Property Damage with X, C and U Hazards included	_____	_____
Blanket Contractual Liability coverage applying to this contract	_____	_____
Employers Liability – Stop Gap	_____	_____

Deductibles or SIR's: GL _____ AL __ Excess _____

Insurer Best Rating GL _____ AL __ Excess _____

This Questionnaire is issued as a matter of information. This Questionnaire is not an insurance policy and does not amend, extend or alter the coverage afforded by the policies indicated on the attached Certificate Of Insurance.

Agency/Broker	Completed by (type)
Address	Completed by (signature)
Name of person to contact	Telephone number

* * * END OF SECTION * * *

INDEX

SECTION 00700

GENERAL CONDITIONS FOR DEVELOPER EXTENSIONS

SECTION 00700
GENERAL CONDITIONS FOR DEVELOPER EXTENSIONS

1. DEFINITIONS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof.

1.1 ADDITIONAL DRAWINGS
All drawings prepared and issued or approved by the Engineer subsequent to approval of the Contract Drawings, and for further explanation or amplification of the Contract Drawings, or for the revision of the same, all as herein provided.

1.2 APPROVAL OR APPROVED
To accept as satisfactory in concept, type, size and standard of quality.

1.3 BONDS
Performance and Payment Bond and Maintenance Bond and other instruments of security furnished by the Developer and his Surety in accordance with the Contract Documents.

1.4 CONTRACT OR THIS CONTRACT
The particular Contract or Developer Extension Agreement executed by the Developer and the District, of which these General Conditions are integral parts.

1.5 CONTRACT DOCUMENTS
The Developer Extension Agreement including the District's Developer Project Manual, the Drawings approved by the District per the Developer Extension Agreement and all other documents and information set forth or referenced therein.

1.6 CONTRACT DRAWINGS OR DRAWINGS
The part of the Contract Documents which shows the characteristics and scope of the Work to be performed and which have been prepared or reviewed by the Engineer.

1.7 CONTRACTOR
The person, firm or corporation contracted by the Developer to complete the Work indicated in the Contract Documents.

1.8 DEVELOPER
Property owner to be benefitted by the proposed developer extension, including the property owner and Developer's agents and Contractor. A party to the Developer Extension Agreement.

1.9 DEVELOPER EXTENSION AGREEMENT
The particular Contract between the Developer and District establishing the conditions and standards for completion of a developer water extension or developer sewer extension.

1.10 DEVELOPER PROJECT MANUAL
The most current collection of documents including information on the developer extension process, conditions and standards for developer water extensions, and conditions and standards for developer sewer extensions provided by the District.

1.11 DISTRICT
Birch Bay Water and Sewer District, a party to the Developer Extension Agreement, and typically referred to as the District in the Developer Project Manual.

1.12 ENGINEER
The District's staff Engineer, or District's Consulting Engineer retained by the District, acting either directly or through his authorized assistants. The District has the right and authority to employ several engineering firms, engineers, inspectors and the like and assign to them various engineering or administrative duties, functions and responsibilities of the "Engineer" as that term is used in this Contract. In such case the District shall advise the Contractor at the pre-construction conference or thereafter in writing of those divisions or assignments of engineering or administrative duties, functions and responsibilities and the firms or persons designated to perform them, and the designee shall be the "Engineer" for contract purposes within the context of the designation.

1.13 EQUIPMENT
The machinery, accessories, appurtenances and manufactured articles to be furnished and/or installed under the Contract.

1.14 EQUIPMENT DATA
Manufacturer's catalog sheets, brochures, diagrams, schematic drawings, performance charts and other descriptive data for Equipment to be furnished by the Contractor as required and provided in the Contract Documents.

1.15 EQUIVALENT
When applied to an alternate of any kind, the word "equivalent" shall mean the following: equal in force, amount, functional performance, appearance and like in significant import but not necessarily admitting to superposition or be like in detail.

1.16 FURNISH AND PROVIDE
All essentials to performance of the function implied by the named subject, article or Material shall be supplied for use, and unless otherwise specifically excepted, the named article, subject or Material is to be incorporated into the Work in the proper place and sequence and in a manner to attain satisfactorily the results required.

1.17 INSTALL
To set up for use or service. However, the use of this word shall not be deemed to imply that the subject shall not be supplied by and at the sole expense of the Contractor.

1.18 ITEM
A convenient subdivision of Work.

1.19 LATEST REVISION (AMENDMENT, ISSUE, SPECIFICATION)
Wherever this (these) phrase(s) is (are) used "Latest" shall refer to the revision (amendment, issue, specification) in effect on the date of the Contract.

1.20 LAWS
The laws of the place where the Work is to be performed (Federal, State and Local).

1.21 LINE AND GRADE
Horizontal and vertical control for all Work which shall be carried from the Contractor’s professional surveyor’s points in a manner established by the professional surveyor.

1.22 MATERIAL OR MATERIALS
Machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with the Contract.

1.23 PLANS
All official Drawings or reproductions of Drawings made or to be made pertaining to the Work provided for in the Contract, or to any structure connected therewith.

1.24 POINTS
All marks, bench marks, reference points, stakes, hubs, tacks, etc., established by the Engineer for horizontal and vertical control of the Work.

1.25 PRODUCT
This term shall include Materials, systems and Equipment.

1.26 PROJECT
The structure or improvement to be constructed in whole or in part through the performance of the Contract.

1.27 PROJECT MANUAL
The Project Manual is defined as the Developer Project Manual and includes the general conditions of the Developer Extension Agreement, the Specifications and related information, requirements and standards.

1.28 RELATED REQUIREMENTS SPECIFIED ELSEWHERE AND RELATED WORK SPECIFIED ELSEWHERE
General terms. Items listed under these headings are for convenient cross reference, but the Items listed are not exclusive of other Contract requirements and in no way limit the Specifications applicable.

1.29 REQUIRE
To call for as necessary and essential.

1.30 REQUIREMENTS
A necessity.

1.31 RESIDENT PROJECT REPRESENTATIVE
The authorized representative of the District who is assigned to the Project site or any part thereof and is sometimes referred to as Resident Engineer or Inspector.

1.32 SHOP DRAWINGS
All shop details necessary for the fabrication and installation of structural steel, pipe, machinery, Equipment, including schedules and bending diagrams of reinforcing steel, and other detailed drawings, to be furnished by the Contractor as required and provided in the Contract Documents.

1.33 SIDE SEWER STUB
The side sewer pipeline beginning at the main line sewer and extending to the vicinity of the property line if construction is on public property or to the margin of the permanent easement if construction is on private property.

1.34 SPECIFICATIONS
The prescribed directions, requirements, explanations, terms and provisions pertaining to the various features of the Work to be done, or manner and method of performance, and the manner and method of measurements and payments contained in Division 1 through 16 of the Project Manual. They also include directions, requirements and explanations as set forth on the Plans.

1.35 SUBCONTRACTOR
Any person, firm or corporation other than an employee of the Contractor, supplying for and under agreement, either with the Contractor, or any Subcontractor of the Contractor, labor or Materials, or both, at the site of the Project in connection with this Contract.

1.36 SUITABLE
Qualified and in all respects adapted to the use and purpose specified.

1.37 SUPPLIER
Any person or organization who supplies Materials or Equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

1.38 SURETY
Any firm or corporation executing a surety bond or Bonds payable to the District, securing the performance of the Contract either in whole or in part.

1.39 WORDS AND PHRASES
Whenever the words, "as required", "as permitted", or words of like effect are used, it shall be understood that the requirements, or permission of the District or Engineer is intended. The words, "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary, or proper in the judgment of the District and Engineer, except in reference to provisions for safety facilities where the judgment of the State Safety Inspectors or persons in similar authority (other than the Engineer or District) shall be intended.

1.40 TIME LIMITS
All time limits stated in the Contract Documents are of the essence of the Contract.

1.41 WORK
The work necessary to manufacture and deliver the machinery, Equipment and Material and/or the furnishing of all labor, tools, Material, Equipment, construction Equipment, working drawings where required, and other necessities for the construction or erection of the structures, facilities or improvements shown and called for in the Contract Documents and the act of constructing or erecting said structures, facilities or improvements complete. It is specifically stipulated that the Drawings, Specifications, and other Contract Documents do not purport to control the method of performing the work, but only the requirements to the nature of the completed work, the Contractor assuming the entire responsibility for methods of performing and installing the work. Suggestions as to method included in the Contract Documents or given by the Engineer shall be deemed advisory only and the feasibility of such methods or the lack thereof shall not affect the Developer’s or Contractor's liability under this Contract.

1.42 WRITTEN NOTICE
Any notice to any party of the Agreement relative to any part of this Agreement in writing

and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Project.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 SCOPE OF WORK

A. The Contractor may be furnished additional instructions and detail drawings, by the Engineer as necessary to carry out the work required by the Contract Documents.

2.2 ADDITIONAL DRAWINGS

A. The Additional Drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the Additional Drawings and instructions.

2.3 NOTICES TO THE DEVELOPER

A. Any notices or services, which it may be necessary to deliver to the Developer in connection with this Contract may be sent to the Developer by regular mail to the Developer's address as recorded in the signed Developer Extension Agreement or, if such address is lacking, to such other address as the District may deem proper.

3. CORRELATION AND INTENT OF DOCUMENTS

3.1 CONTRACT DOCUMENTS

A. As provided in the Agreement, the Contract Documents are complementary and what is called for by any one shall be binding as if called for by all. The intention of the Documents is to include, unless otherwise specifically stated, all labor and Materials, Equipment, and transportation necessary for the proper execution of the Work. It is the intent of this Contract and its Drawings and Specifications and other Contract Documents to specify and set forth a complete operating unit or system ready for use between the Contract limits. In determining the scope of Work the Plans and Specifications and Contract Documents shall be considered in their entirety. Where Items of the Work are specified or shown in general terms or without complete detail it is intended that such Item shall be a complete operating Item regardless of whether or not every detail has been set forth in the Contract Documents and omission of such details shall not be construed to mean that they are to be omitted by the Contractor. Omission of a major Item shall not be construed to mean that such Item may be omitted by the Contractor and the Contractor may be required to perform such major Item. This section of General Conditions is intended to supplement the other Contract Documents. If a conflict between the Developer Extension Agreement or other Contract Documents and these General Conditions occurs, the conflict shall be resolved in favor of the Developer Extension Agreement or other Contract Document.

3.2 REFERENCE STANDARDS

A. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the Latest standard specification, manual, code or law or regulation in effect at the time of execution of the Contract, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of District, Developer, Contractor or Engineer, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the other provisions of this Contract.

4. CONFORMITY TO DRAWINGS AND SPECIFICATIONS

4.1 CONTRACT DOCUMENTS

A. All Work shall be done in strict conformity to the Drawings and Specifications and to the exact Line and Grades as fixed by field survey.

B. The District reserves the right to make reasonable changes in location of Materials and Equipment, if such is considered expedient for a better constructed and operable unit or system; considering, however, that such changes are made prior to any Work done on said Item to be changed. Such changes to be done at no additional cost to the District.

4.2 ALTERNATE DESIGNS INITIATED BY THE CONTRACTOR

A. In the event that the Developer or Contractor shall request, or submit, an alternate design, or designs for some portion of his Work, the Engineer will consider such alternate designs with reasonable promptness. Such requests for either a design review of alternate plans submitted by the Contractor, or request for a redesign initiated by the Contractor, as set forth above shall be made in writing to the Engineer.

B. Provided that such proposed alternate designs, or requested redesigns appear reasonable and satisfactory to the Engineer, the Engineer will perform an engineering review of the proposed alternate design, or if requested by the Contractor the Engineer will perform an engineering redesign of the Work to assure its compatibility within the framework of a complete operating unit, or system, ready for use between the Contract limits.

C. The cost of the engineering review of the proposed alternate, or the cost of an engineering redesign as requested by the Contractor will be charged to the Developer by the District at the Engineer's currently established rate.

5. MATERIALS AND APPLIANCES

5.1 PROVISIONS

A. Unless otherwise stipulated, the Developer shall Provide and pay for all Materials, labor, water, tools, equipment, light, power, transportation, and all other facilities necessary for the execution and completion of the Work.

6. DOCUMENTS

6.1 FURNISHED BY THE CONTRACTOR

A. Contractor shall Provide himself with Drawings and Project Manual at the location and under the conditions described in the Contract Documents.

B. Contractor shall Provide himself with such documents as may be incorporated into the Contract by reference.

C. Contractor shall Provide himself with such Government Specifications, American National Standards, State Standards and other such drawings, specifications or standards as may be referred to in the Project Manual or on the Drawings, which are by such reference incorporated into the Contract Documents as if set forth herein in full.

D. Contractor shall Provide himself with access to such codes, local regulations and Laws as may be required by law, regulation and/or the Contract.

6.2 OWNERSHIP OF DRAWINGS

A. All Drawings and Specifications are to become the property of the District upon completion of the Work, and shall be turned over to the District upon demand, and shall not be used for any other work.

7. STATUS OF THE ENGINEER

7.1 INSPECTION

A. The Engineer shall act as advisor and consultant to the District in engineering matters relating to the Contract. The Engineer shall have access to the site of the Work and all Work and material to observe the progress and quality of the executed Work.

B. The District, through its duly authorized official, shall have the authority to stop the

Work whenever in his opinion such stoppage is necessary to insure the proper execution of the Contract, and any order by the District to stop Work shall in no case relieve the Developer from the obligations of his Contract.

7.2 INTENT OF DRAWINGS AND SPECIFICATIONS

A. To avoid any misunderstandings which might arise as to the import of anything contained in the Drawings and Specifications or as to any discrepancy, error, or omission therein, seeming or actual, the Engineer's decision as to the true intent and meaning, and correction thereof, shall be binding and final. All dimensions will be considered valid. In the event of omitted dimensions, Work shall not be started until the necessary dimensions have been obtained from the Engineer in writing.

7.3 ENGINEER TO HAVE ACCESS

A. The Engineer shall at all times have access to all parts of the Work and to the shops wherein the Work is in preparation for the purpose of inspection, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

8. PAYMENT FOR QUALITY CONTROL

8.1 GENERAL

A. The Contractor shall Provide at his expense the testing and inspection services required by the Contract Documents.

9. ROYALTIES AND PATENTS

9.1 PAYMENT AND USE

A. If the Drawings or Specifications require, as part of the completed Work the installation of a patented appliance, device or article or the continued use after completion of the Work of a patented process, for use of which any royalties or license fees are chargeable for such continued use, the District will pay such royalties or license fees from and after the completion date of the contract.

B. The Developer or Contractor shall pay all other royalties and license fees, and shall hold and save the District and its officers, agents or employees harmless from liability for violation of patent rights, including all costs and legal expenses, for, or on account of, any patented invention, process, article, or appliance manufactured for or used in the performance of the Contract, including its use by the District.

10. SURVEYS

10.1 STAKES AND MARKS TO BE PRESERVED

A. All marks, bench marks, reference Points and stakes established by the Engineer to control construction of this Project, shall be carefully preserved by the Contractor, and in case of their destruction by the Contractor or any of his employees, such stake will be replaced by the Engineer at the Contractor's expense and the full cost of replacement will be borne by the Contractor.

B. Where in the opinion of the Engineer, any section corner, section sub-division corner, plat, USC and GS, USGS or other official monument or bench mark is in danger of being disturbed by normal construction operations, it will be referenced by the Engineer and replaced by the Engineer after completion of all construction Work. All costs in connection with the referencing and replacing of monuments shall be at the expense of the Developer.

C. Any other monuments not referenced by the Engineer that are disturbed by construction operations shall be reset by the Contractor in accordance with recognized Engineering and Surveying practices at his expense. Property corners, fences and other indications of property lines shall be referenced by the Contractor prior to construction and reset after completion of the construction operations in accordance with recognized Engineering and Surveying practices at the expense of the Contractor. In the event that any of these Items are not replaced by the Contractor, they shall be replaced by the Engineer and the cost of this Work shall be billed to the

Developer by the District and such costs shall constitute a basis for a lien against the Contractor's Work.

11. PROTECTION OF WORK, PROPERTY AND PERSONS

11.1 SAFETY AND HEALTH REGULATIONS

A. In order to protect the lives and health of his employees under the Contract, the Developer and its Contractor shall comply with all pertinent provisions of applicable Laws and regulations as they pertain to health and safety standards; and with all state and local safety acts and regulations applicable to the Work; and shall maintain an accurate record of all cases of death, occupational disease and injury arising out of and in the course of employment on Work under the Contract. The Developer and its Contractor shall be solely and completely responsible for safety and safety conditions on the job site, including the safety of all persons and property during performance of the Work and additionally, while workers are in transit to and from the job site. The services of the District's or its Engineer's personnel in conducting a construction review of the Developer's and Contractor's performance is not intended nor shall be interpreted to include review of the adequacy of the Developer's and Contractor's Work methods, equipment, bracing, scaffolding, or trenching, or safety measures in, on, or near the construction site.

B. The Developer and its Contractor shall be solely and completely responsible to perform all Work and Furnish all Materials in strict compliance with all applicable state, city, county, and federal Laws, regulations, ordinances, orders and codes. The Developer's and Contractor's attention is directed to the requirements of the Washington Industrial Safety and Health Act, WISHA, RCW 49.17. The Developer and its Contractor shall Provide safe access for the District and its inspectors to adequately inspect the quality of Work and the conformance with Project Specifications.

11.2 EMERGENCIES

A. In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or District, shall act to prevent threatened damage, injury or loss. He will give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

11.3 CARE AND PROTECTION OF WORK

A. The Developer and Contractor shall be responsible for all damages that occur as a result of his fault or negligence in connection with the prosecution of the Contract and shall be responsible for the proper care and protection of all Materials delivered and Work performed until completion, and final acceptance by the District. Such proper care and protection shall include necessary provisions to prevent damage or loss of Material and Equipment due to fire, flood, theft and/or vandalism.

B. The Contractor shall Provide such heat, covering and enclosures as are necessary to protect all Work and Materials against damage by weather conditions.

12. SUPERVISION

12.1 GENERAL

A. The Contractor shall keep on his Work during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Engineer. The Superintendent shall represent the Contractor in his absence and all directions given to him shall be binding as if given to the Contractor. The Contractor shall designate, in writing, who his superintendent is to be.

B. The Contractor shall give efficient supervision to the Work, using his best skill and attention. He shall carefully study and compare all Drawings and Specifications and other instructions, and shall at once report to the Engineer any error, inconsistency,

or omissions which he may discover.

13. WARRANTY OF TITLE

13.1 MATERIAL, SUPPLIES, AND EQUIPMENT

A. No Material, supplies, or Equipment for the Work under this Contract shall be purchased subject to any security transaction, chattel mortgage or under a conditional sale or other agreement by which an interest therein or if any part thereof is retained by the seller or Supplier or any other person. The Developer and Contractor warrant good title to all Material, supplies and Equipment installed or incorporated in the Work and agrees upon completion of all Work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the District free from any claims, liens, or charges and further agrees that neither he nor any person, firm or corporation furnishing any Materials or labor for any Work covered by this Contract shall have any right to a lien upon the premises or any improvement or any appurtenances thereon, provided that this shall not preclude the Contractor from installing metering devices and other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the city. In the event of the installation of any such metering devices or equipment, the Contractor shall advise the District as to the owner thereof. Nothing contained in this article, however, shall defeat or impair the right of such persons to look to funds due the Developer or Contractor in the hands of the District. The provisions of this subsection shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing Materials for the Work when no formal contract is entered into for such Materials.

14. CORRECTION, UTILIZATION OF DEFECTIVE WORK

14.1 REJECTED MATERIALS AND WORKMANSHIP

A. The Engineer shall have the right to reject Materials and workmanship which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected Materials shall be removed from the premises without charge to the District. If the Contractor does not correct such rejected Work within a reasonable time, fixed by Written Notice, the District may correct same and charge the expense to the Contractor.

14.2 REINSPECTION

Should it be considered necessary or advisable by the Engineer at any time before final acceptance of the entire Work to make an examination of Work already completed, by removing or tearing out any portion thereof, the Contractor shall on request promptly Furnish all necessary facilities, labor and Materials. If such Work is found to be defective in any respect due to the fault of the Contractor or his Subcontractor, he shall defray all the expenses of such examinations and satisfactory reconstruction.

14.3 DISTRICT MAY CORRECT DEFECTIVE WORK

If Contractor fails within a reasonable time after Written Notice from the Engineer to proceed to correct defective Work or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, District may, after seven (7) days' Written Notice to Contractor, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph District shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, District may exclude Contractor from all or part of the site, take possession of all or part of the Work, and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all Materials and Equipment stored at the site or are stored elsewhere. Contractor shall allow District, District's representatives,

agents and employees such access to the site as may be necessary to enable District to exercise the rights and remedies under this Article. All direct, indirect and consequential costs of District in exercising such rights and remedies will be charged against Developer in an amount approved as to reasonableness by Engineer. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration costs and all costs of repair and replacement of Work of others destroyed or damaged by correction, removal or replacement of Contractor's defective Work. Contractor shall not be allowed an extension of the contract time because of any delay in performance of the Work attributable to the exercise by District of District's rights and remedies hereunder.

15. INSURANCE

15.1 GENERAL

A. The Developer shall Provide to the District a certificate(s) of insurance and endorsements for each policy of insurance meeting the requirements set forth herein when prior to start of construction. The certificate and endorsements shall conform to the following requirements:

1. An ACORD certificate or a form determined by the District to be Equivalent. The certificate or an endorsement form shall indicate the Developer's insurance is primary and non-contributory.
2. The Developer shall obtain endorsement forms CG 20 10 10 01 and CG 20 37 10 01, or the Equivalent of each, naming the District and all other parties listed herein as additional insured(s) and providing the policy number. If the Developer is unsuccessful in securing these endorsements after exerting commercially reasonable efforts, the Developer shall obtain other endorsements providing Equivalent coverage to the additional insured(s), subject to the review and approval of such other endorsement forms by the District. A statement of additional insured status on an ACORD certificate of insurance shall not satisfy this requirement. Commercially reasonable efforts shall be evidenced by a signed statement by the Developer's insurance broker certifying the endorsement forms required by the District are not available, and the endorsements submitted provide Equivalent coverage to the additional insured(s).
3. Any other amendatory endorsements to show the coverage required herein.

15.2 WORKER'S COMPENSATION AND LIABILITY INSURANCE

A. The Developer's Contractor shall maintain worker's compensation insurance and/or longshore and harbor's workers insurance (or Jones Act coverage for all employees eligible for same) as required by state or federal statutes for all employees employed to be engaged in Work under this Contract on the Project and, in case any such Work is sublet, the Developer's Contractor shall require the Subcontractor similarly to Provide worker's compensation insurance and/or longshore and harbor's workers insurance (or Jones Act coverage) for all the latter's' employees to be engaged in such Work. The Developer's Contractor's Labor and Industries account number shall be noted on the Certificate of Insurance. In the event any class of employees engaged in the Work under this Contract is not covered under worker's compensation insurance and/or longshore and harbor's workers insurance (or Jones Act coverage) as required by state and federal statute, the Developer shall maintain and cause the Contractor and each Subcontractor to maintain employees liability insurance for limits of at least $1,000,000 each employee for disease or accident, and shall Furnish the District with satisfactory evidence of such.

15.3 PUBLIC LIABILITY INSURANCE

A. The Developer shall obtain and keep in force during the term of any contract, Commercial General Liability and Auto Liability insurance policies with insurance

companies which have an A. M. Best's rating of "A VII" or better, and who are approved by the Insurance Commissioner of the State of Washington pursuant to Title 48 RCW. All insurance coverage required by these Specifications shall be written and provided by "occurrence-based" policy forms rather than "claims-made" forms.

B. Prior to the execution of the Contract, the Developer shall purchase and maintain during the term of the Contract Comprehensive General Liability and Auto Liability insurance policies meeting the requirements set forth herein. The Developer shall file with the District a certified copy of all policies of insurance, endorsements, and coverages or a Certificate of Insurance with such endorsements attached, as are necessary to comply with these Specifications. Failure of the Developer to fully comply with the requirements regarding insurance shall be considered a material breach of Contract and shall be cause for immediate termination of the Contract and of any and all District obligations, regarding same.

C. The Developer shall not begin Work under the Contract or under any special condition until all required policies of insurance, endorsements and coverages have been obtained and until such insurance has been approved by the District. Said insurance shall provide coverage to the Developer, District and Engineer. The coverage so provided shall protect against claims from bodily injuries, including accidental death, as well as claims for property damages which may arise from any act or omission of the Developer, the Developer's Contractor, his Subcontractors, or by anyone directly or indirectly employed by any of them. Approval of Developer's insurance by the District shall not relieve Developer from any requirements to obtain specific insurance, endorsements and coverages required by the Contract unless otherwise agreed in writing as a modification of this Contract.

D. The insurance policies shall include an endorsement which specifically names the District, its elected or appointed officers, officials, employees, Engineer and agents and volunteers as additional insureds with regards to damages and defense of claims arising from: (a) activities performed by or on behalf of the Developer; or (b) products and completed operation of the Developer, or (c) premises or equipment leased, owned or used by the Developer. The insurance shall be maintained in full force and effect at the Developer's expense throughout the term of the Contract.

E. The District shall provide the District at least forty-five (45) days' Written Notice of cancellation, nonrenewal, material reduction or modification of coverage. Such notice to District shall be made by certified mail. The insurance policies shall include an endorsement which requires that the District be given such 45 days' notice. The Developer shall maintain its products completed operations coverage for a minimum of three years after the termination of the Contract.

F. The coverage provided by the Developer's insurance policies shall be primary to any insurance maintained by the District. Any insurance that might cover this Contract which are maintained by the District shall be in excess of the Developer's insurance and shall not contribute with it.

G. The Developer's insurance policies shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured as respects any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured. However, this provision shall not increase the limits of the insurer's liability.

H. The General Aggregate provision of the Developer's insurance policy shall be amended to show that the General Aggregate Limit of the policies apply separately to this Project.

I. The Developer's insurance policies shall not contain deductible or self-insured retentions in excess of $10,000 unless approved by the District.

J. The Developer's insurance policies shall contain a provision that the District has no obligation to report events which might give rise to a claim until a claim has been filed with the District's Board of Commissioners.
K. Providing of coverages in the stated amounts shall not be construed to relieve the Developer from liability in excess of such limits.
L. The Developer shall have its Insurance agent/representative complete the Insurance Coverage Questionnaire contained in the Developer Project Manual and attach it to the Certificate of Insurance for District's approval. Notations made on the certificate of insurance as to satisfying these insurance requirements is not sufficient evidence – only endorsements to the affected policies will be accepted.
M. The contractual coverage of the Developer's policy or policies shall be sufficiently broad enough to insure for the provisions of the hold harmless and indemnification clauses included in the Contract.
N. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Developer's and its Contractor's responsibility for payment of damages resulting from their operations under this Contract.
O. Type of Limits of Insurance Required:
    1. Commercial General Liability
        a. $2,000,000 each occurrence Bodily Injury and Property Damage Liability
        b. $2,000,000 annual aggregate
        c. Employees and volunteers as additional insureds
        d. Premises and operations
        e. Broad form property damage including underground, explosion and collapse hazards (XCU)
        f. Products completed operations (including three years beyond Contract term)
        g. Blanket contractual
        h. Subcontractors
        i. Personal Injury with employee exclusion deleted
        j. Employer's liability (Stop gap)
    2. Automobile Liability
    3. $2,000,000 per accident Bodily Injury and Property Damage Liability, including any owned automobile, hired automobile or non-owned automobile
    4. Umbrella Liability
        a. $2,000,000 per occurrence
        b. $2,000,000 aggregate
    5. As an alternative to the above indicated Commercial General Liability and Umbrella Liability insurance policies, the Developer may provide the District with an Owner and Contractors Protective (OCP) Policy with a limit of coverage of $5,000,000. The Developer shall additionally provide the District with evidence that the District and Engineer have been named as additional insured on the Contractor's general liability policy for at least products completed operations coverage.

P. For projects where asbestos containing materials have been identified on the Plans:
    1. The Developer shall assume all risk and liability for the handling, removal and disposal of asbestos containing material (ACM). The Developer shall comply with all federal, state and local Laws, statutes and regulatory agency regulations and requirements including but not limited to the requirements relating to environmental pollution and the requirements relating to the handling, removal and disposal of ACM. The Developer shall insure that all Work that involves ACM complies with all federal, state and local Laws and regulations. The Developer shall be

responsible for any and all fines or penalties that may be levied due to the Developer's or its Contractor's violation of any of the aforementioned Laws and regulations.

2. In addition to the insurance requirements in this Contract, the Developer shall provide liability insurance covering bodily injury and property damage resulting from Work associated with ACM. The District, its elected and appointed officials, officers, employees, agents, Engineer, shall be indemnified and held harmless by Developer from any and all liability arising out of the Work and incidental efforts involving ACM, including the handling, removal and disposal of such materials.
3. The District, its elected or appointed officials, officers, employees, Engineer, agents and volunteers shall be added as insureds on the Developer's policy with regard to damages and defense of claims arising from (a) activities performed by or on behalf of the Developer; (b) products and completed operations of the Developer; and (c) premises owned, leased or used by the Developer, as all respects asbestos containing materials.
4. The limits of such coverage shall be as follows:
   a. Occurrence Basis

Bodily Injury	$2,000,000 per occurrence
Property Damage	$2,000,000 per occurrence
	$2,000,000 annual aggregate

15.4 BUILDER'S RISK INSURANCE

A. For Project or portion of Project involving structures (e.g. pump/lift/booster stations, reservoirs, buildings of any type), the Developer shall maintain for the life of the Contract Builder's Risk Insurance, including coverage for earthquake and flood perils, for 100% of the completed value of the structure portion of the Project. An installation floater with coverage no more restrictive than the Builder's Risk coverage described above may be used in lieu of the Builder's Risk coverage when appropriate. The District is to be an insured on the policy. The insurance carrier shall be notified of partial occupation or use by the District. Such partial occupation or use shall not void the insurance.

16. CONTRACT SECURITY

16.1 PERFORMANCE AND PAYMENT BOND AND MAINTENANCE BOND

The Developer shall prior to start of the Work Furnish the District with a Performance and Payment Bond in penal sum equal to the amount of the estimated value of the Work, as approved by the District or its Engineer, conditioned upon the performance by the Developer of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Developer and its Contractor to all persons supplying labor and Materials in the prosecution of the Work provided by the Contract Documents. The Performance and Payment Bond shall hold the District harmless from claims by all persons supplying labor and Materials which would arise under the public works lien statutes, mechanics' lien statutes or other source. The Developer shall prior to Final Acceptance of the Work Furnish the District with a Maintenance Bond in penal sum equal to the amount directed in the Developer Extension Agreement. Such Bonds shall be executed by the Developer and a corporate bonding company licensed to transact such business in the State of Washington and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570.

A. The expense of the Bonds shall be borne by the Developer. If at any time a Surety on any such bond is declared a bankrupt or loses its right to do business in the State of Washington or is removed from the list of Surety Companies Acceptable on Federal

Bonds, Developer shall substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the District. The premiums on such Bonds shall be paid by the Developer. No further payments shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished acceptable Bonds to the District.

17. INDEMNFICATION

17.1 The Developer shall defend, indemnify and save harmless the District, its officers, Engineer, employees and agents, from any and every claim and risk and all losses, damages, demands, suits, judgments and attorney fees, and other expenses of any kind, on account of injury to or death of any and all persons and/or on account of all property damage of any kind, whether tangible or intangible, including loss of use resulting therefrom, in connection with the Work performed under this contract, or caused or occasioned in whole or in part by reason for the presence of the Developer, its Contractor or its Subcontractors, or their property, employees or agents, upon or in proximity to the property of the District or any other property upon which the Developer or its Contractor is performing any Work called for or in connection with this contract, except only for those losses resulting solely from the negligence of the District, its officers, Engineer, employees and agents. Should a court of competent jurisdiction determine that this Agreement is subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of the Developer or its Contractor and the District, its members, officers, Engineer, employees, and agents, the Developer or its Contractor's liability hereunder shall be only to the extent of the Developer or its Contractor's negligence. This indemnification provision 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, Contractor, or any Subcontractor, under workman's compensation acts, disability benefit acts or other employee benefit acts. It is further specifically and expressly understood that the indemnification provided herein constitutes Developer's and its Contractor's and Subcontractor's waiver of immunity under industrial insurance, Title 51 RCW, solely for the purposes of this indemnification. This waiver has been mutually negotiated by the parties. If a lawsuit results with respect to this hold harmless provision, the Developer shall appear and defend that lawsuit at its own cost and expense, and if judgment is rendered or settlement made requiring payment of damages by the District, its officers, Engineer, agents, employees and agents, the Developer shall pay the same

18. PROPERTY RESTORATION

18.1 Whenever the Developer fails to repair or restore existing improvements damaged by his operations within seventy-two (72) hours of Written Notice, the District may order said Work done by others and all costs incurred shall be paid by the Developer.

19. SEPARATE CONTRACTS

19.1 RELATIONS WITH OTHER CONTRACTORS AND DISTRICT

A. The District reserves the right to award other contracts in connection with this Work. The Developer shall afford other contractors reasonable opportunity for the introduction and storage of their Materials and the execution of their work, and shall properly connect and coordinate his Work with theirs.

B. If any part of the Developer's Contractor's Work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect, and within fourteen (14) calendar days after given notice to proceed, report in writing to the Engineer, any defect in such work that render it unsuitable for such proper execution and results. His failure so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his Work except as to the defects which may develop in the other contractor's work after the execution of the

Contractor's Work.

C. To insure proper execution of his subsequent Work, the Contractor shall measure work already in place and shall report in writing to the Engineer any discrepancies between the executed work and the Drawings.

19.2 DISTRICT FREE FROM DAMAGE CLAIMS

If, through acts of neglect or unjustified omissions or default on the part of the Developer, its Contractor, another contractor or any subcontractor of any other contractor shall suffer loss or damage to the Work, the Developer agrees to settle with such other contractor or subcontractor by agreement or arbitration, if such contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the District on account of any damage alleged to have been so sustained, the District shall notify the Developer, who shall indemnify, and save harmless the District and shall assume and pay for the defense costs of any such claims, provided however that the Contractor shall have no liability to indemnify against liability for loss or damages caused by or resulting from the sole negligence of the District and/or Engineer, and in the event that such liability for loss or damages to Work is caused by the concurrent negligence of the District and/or Engineer or its agents or employees and the Developer or its Contractor or its agents or employees, the obligation hereof shall be enforceable only to the extent of the Developer or its Contractor's negligence.

19.3 OCCUPANCY OF THE SITE

A. Nothing herein contained shall be interpreted as granting to the Developer or Contractor exclusive occupancy of the site of the Project. The Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If the performance of any contract is likely to be interfered with by the simultaneous execution of some other contract or contracts, the District shall decide which contractor shall cease Work temporarily and which contractor shall continue, or whether the Work under the contracts can be coordinated so that the contractors may proceed simultaneously. The District shall not be responsible for any damages suffered or extra costs incurred by the Developer or Contractor resulting directly or indirectly from the performance or attempted performance of any other contract or contracts existing or known to be pending at time of Contract.

20. SUBCONTRACTORS

20.1 SPECIALTY SUBCONTRACTORS

A. Specialty Subcontractors shall be utilized for the performance of such parts of the Work under this Contract as under normal contract practices, are performed by Specialty Subcontractors, unless the District determines that the Contractor has heretofore customarily performed such specialty Work with his own organization and is equipped to do so, or unless the District determines that performance of the specialty Work by Specialty Subcontractors will result in increased costs or inordinate delays.

20.2 CONTRACTOR RESPONSIBLE FOR SUBCONTRACTORS

A. The Contractor shall not subcontract any Work to be performed or any Materials to be furnished in the performance of the Contract without the prior written consent of the District. If the Contractor shall subcontract any part of this Contract, the Contractor shall be fully responsible to the District for the acts and omissions of his Subcontractor and of the persons either directly or indirectly employed by the Subcontractor, as he is for the acts and omissions of himself and of persons directly employed by him. Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the District.

20.3 DISTRICT'S APPROVAL OF SUBCONTRACTOR

A. The District's consent to or approval of any subcontract under this Contract shall not in any way relieve the Developer or its Contractor of his obligations under this Contract and no such consent or approval shall be deemed to waive any provisions of this Contract.

21. ENGINEER'S AUTHORITY

21.1 LIMITATION

A. The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

22. LAND AND RIGHT-OF-WAY

22.1 PROVIDED BY DISTRICT

A. Unless expressed in the Contract or otherwise in writing by the District, the District will not provide land and/or right-of-way necessary for carrying out the completion of the Work to be performed pursuant to the Contract Documents except for Work proposed for completion in existing public agency rights-of-way or in existing District's easements, for which the District has an existing easement, permit or franchise for its systems in such rights of way.

B. The Developer shall meet and fulfill all covenants and stipulations of each right of way permit obtained by the District for this Project. The Developer is required to protect the District on all easements and to do all necessary Work required to protect the covenants and stipulations on each right of way.

C. The District will provide to the Contractor information which delineates and describes the lands owned and right-of-way acquired.

22.2 PROVIDED BY DEVELOPER

A. The Developer or its Contractor shall provide at his own expense and without liability to the District any additional land and access thereto that the Contractor may desire for completion of the Work, for temporary construction facilities, or for storage of Materials.

22.3 WORK ON RIGHT-OF-WAY OTHER THAN DISTRICT'S

A. Work on railroad, state highway, other public road, or any right-of-way other than the District's shall be in conformity with the requirements of the authority having jurisdiction over such right-of-way. The Contractor shall obtain all required permits, provide all required notice, and perform all necessary restoration Work.

22.4 WATER COURSES

A. The Developer shall provide for the flow of all water courses, sewers or drains, intercepted or disturbed by the Contractor during the progress of the Work, and shall pay any damage that may be caused by flood waters, alterations of flow patterns and all erosion damage resulting therefrom.

23. WARRANTIES

23.1 GENERAL GUARANTEE AND WARRANTY

A. For a period of two (2) years from the date of final acceptance of the Work under the Contract, workmanship and Materials, and Equipment furnished by the Developer and

incorporated in the Project, shall be guaranteed by the Developer to remain in normal working order and condition except where abused or neglected by the District, and the Developer shall repair or replace at his own expense any Work or Material that may prove to be defective during the period of this guarantee. The Developer shall obtain warranties from Contractor and from Subcontractors and Suppliers of Materials or Equipment where such warranties are specifically required herein, and shall deliver copies to the District upon completion of the Work.

B. Neither the acceptance of the Work by the District nor any provision in the Contract nor partial or entire use or occupancy of the premises by the District shall constitute an acceptance of Work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibilities for faulty Materials and workmanship.

23.2 EQUIPMENT WARRANTY

A. Equipment furnished shall bear a two (2) year (from date of final acceptance of the Work under the Contract by the District) manufacturer's warranty against defects in Materials and workmanship, in addition to the Developer's wo-year guarantee unless specified elsewhere in these Specifications. All parts or Equipment found defective or showing signs of undue wear within two (2) years from date of final acceptance, shall be replaced at no cost to the District. The warranty shall be in full effect with no qualifications or reservations.

24. COMPLIANCE WITH LAWS

24.1 GENERAL

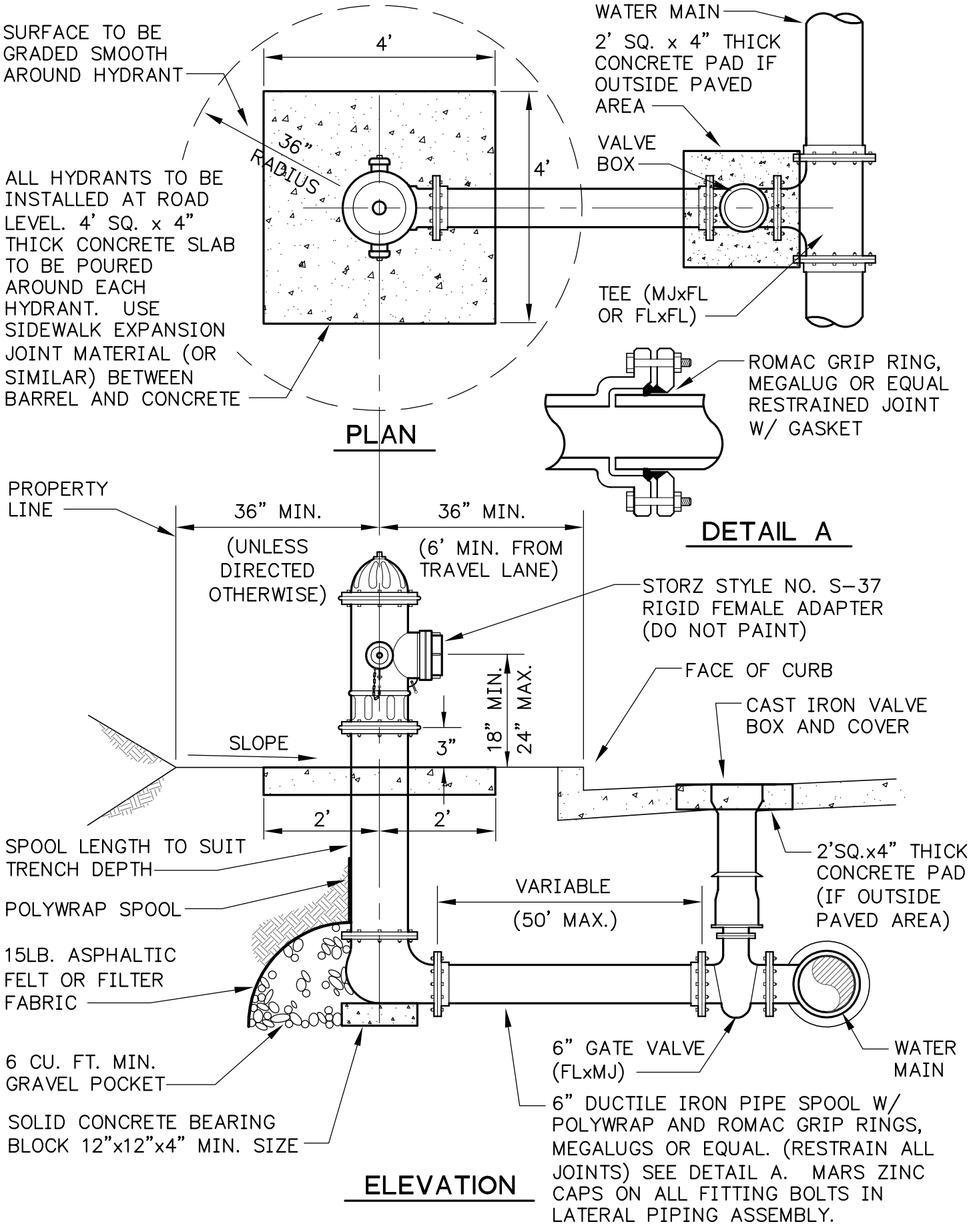
A. In all operations connected with the Work embraced in this agreement, the Developer shall be held responsible for any failure to respect, adhere to, and comply with, all ordinances, Laws and public permits governing, controlling or limiting in any way the action of those engaged upon the Work. If Developer observes that the Specifications or Drawings are at variance with any laws or regulations, Developer shall give Engineer prompt Written Notice thereof.

* * * END OF SECTION * * *

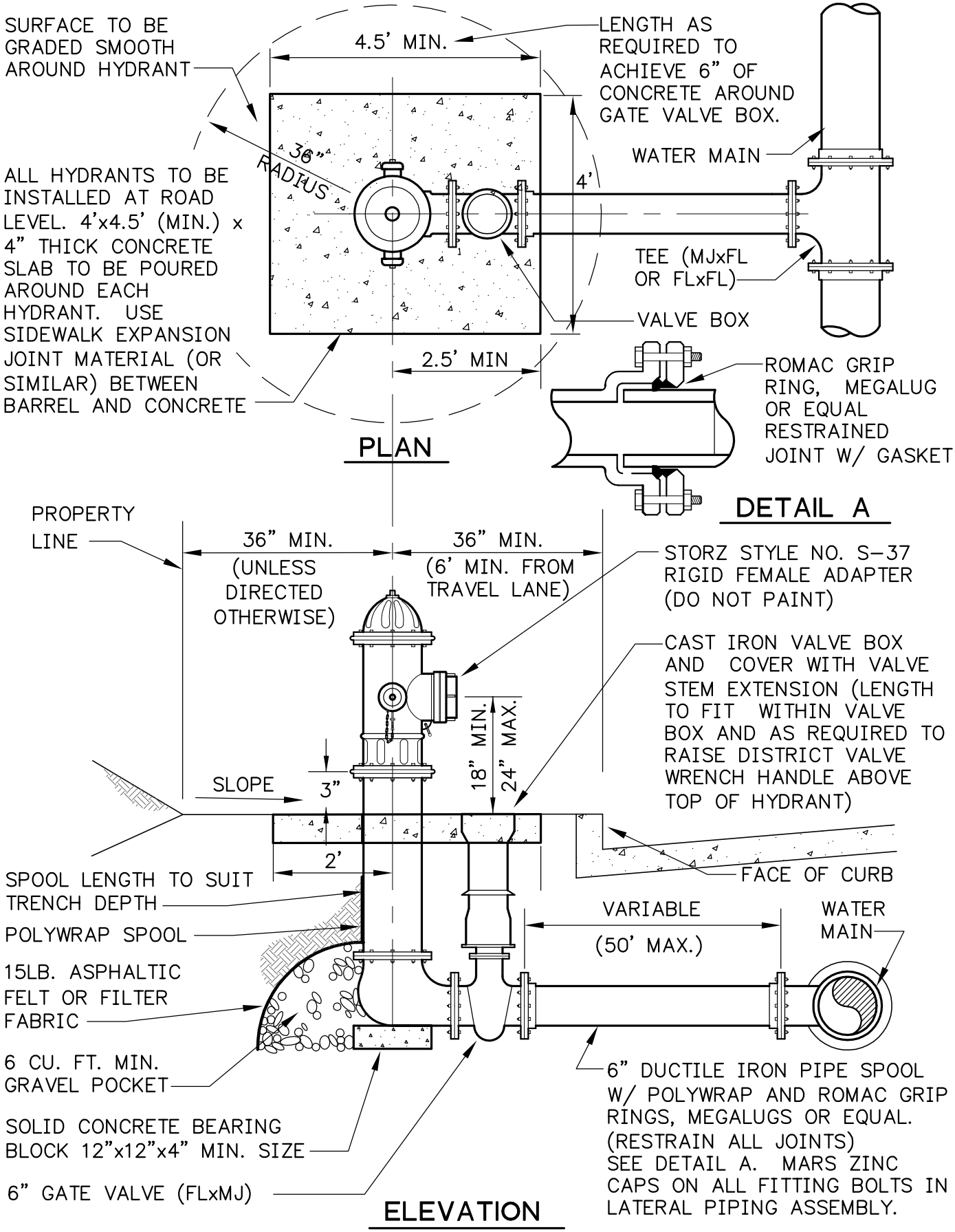
INDEX

SECTION 00880

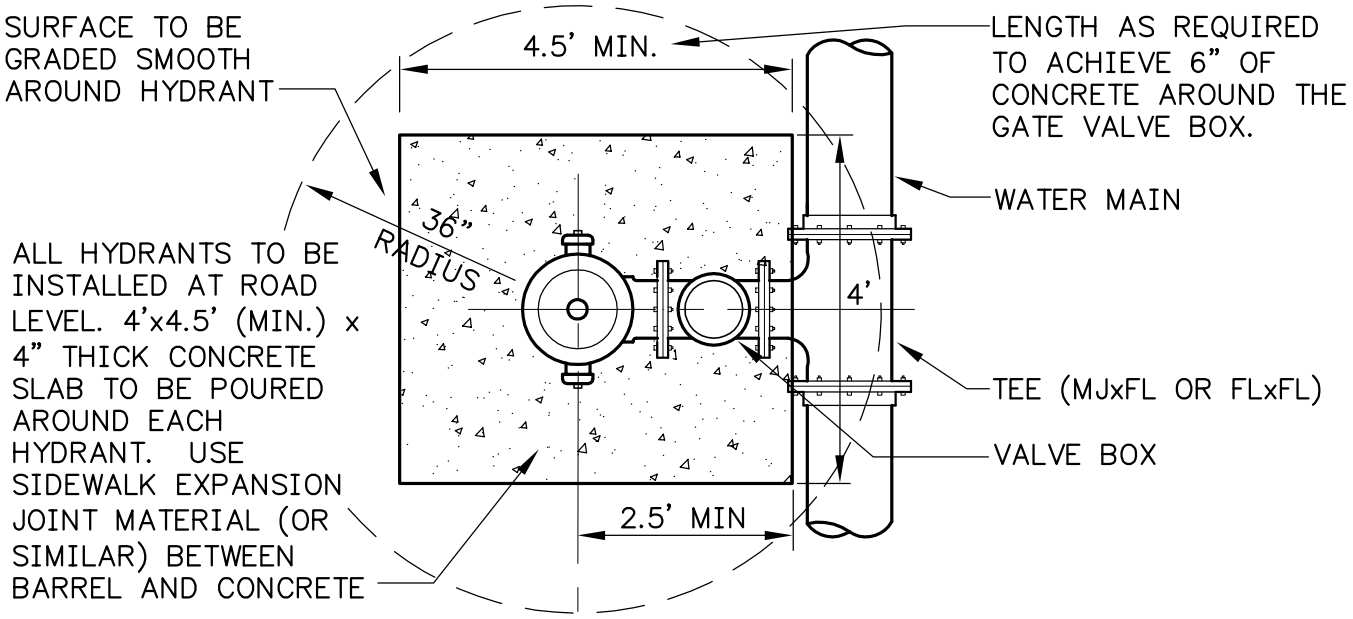
DETAILS



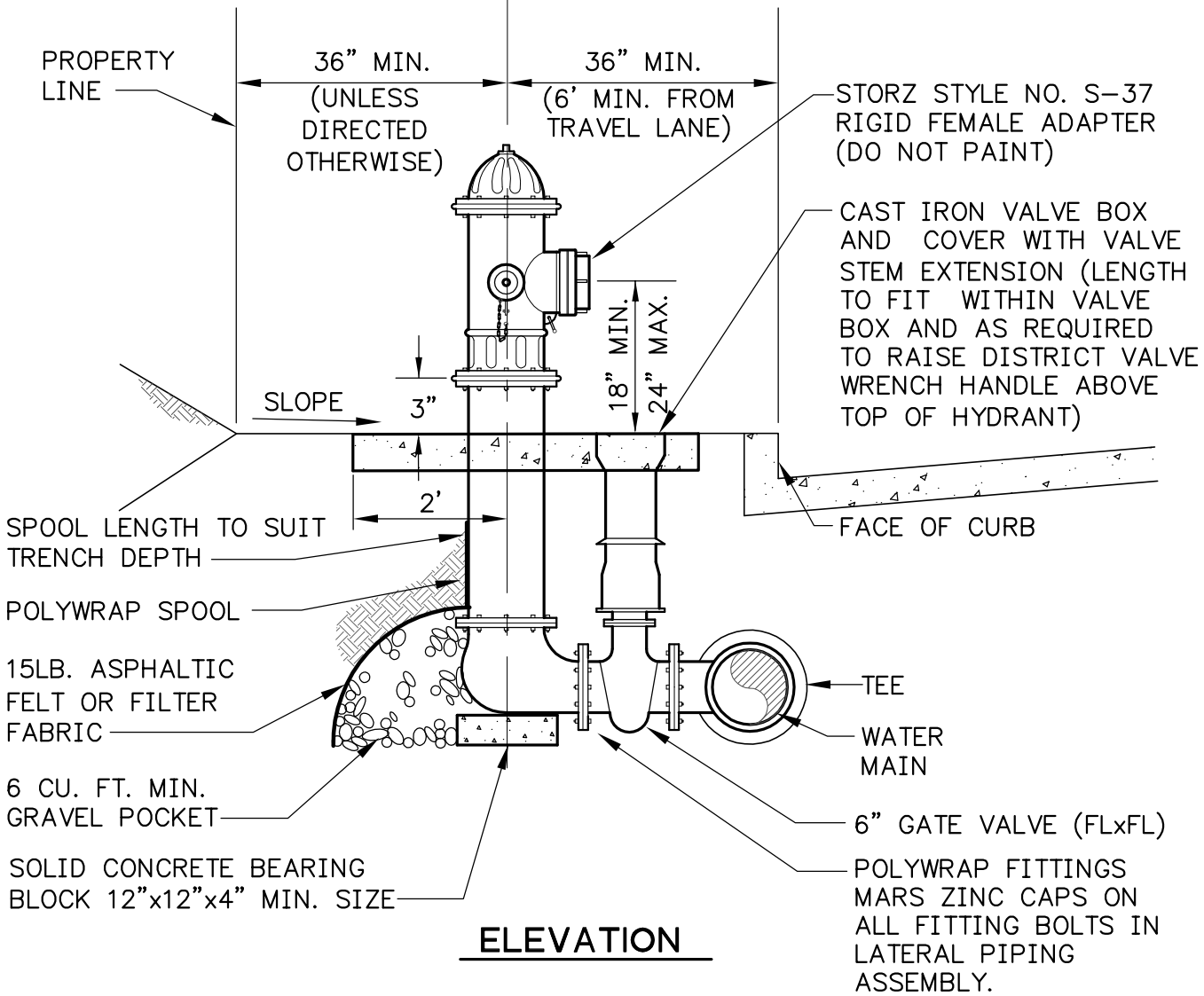
1 TYPE A HYDRANT ASSEMBLY



2 TYPE B HYDRANT ASSEMBLY

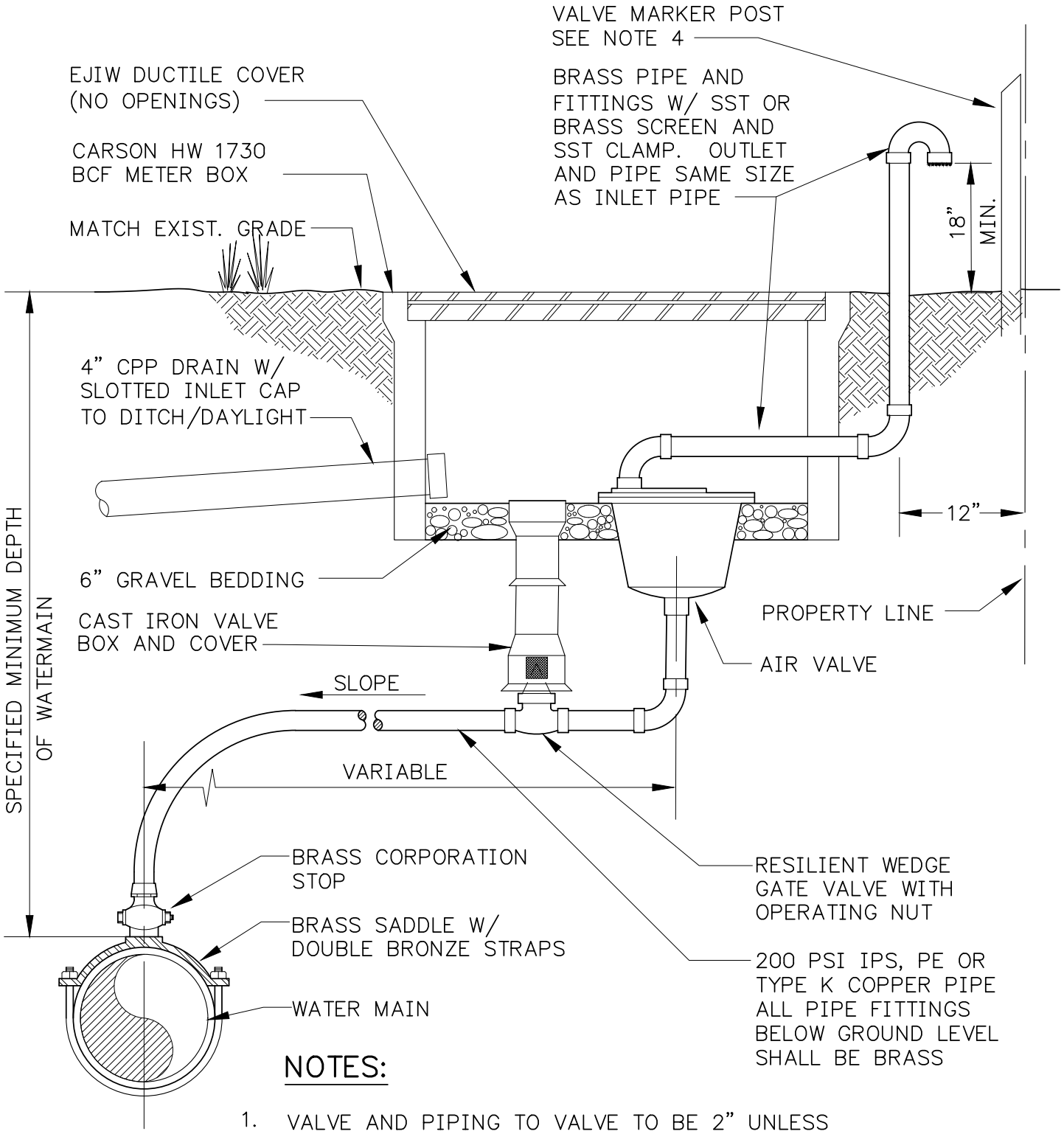


PLAN



ELEVATION

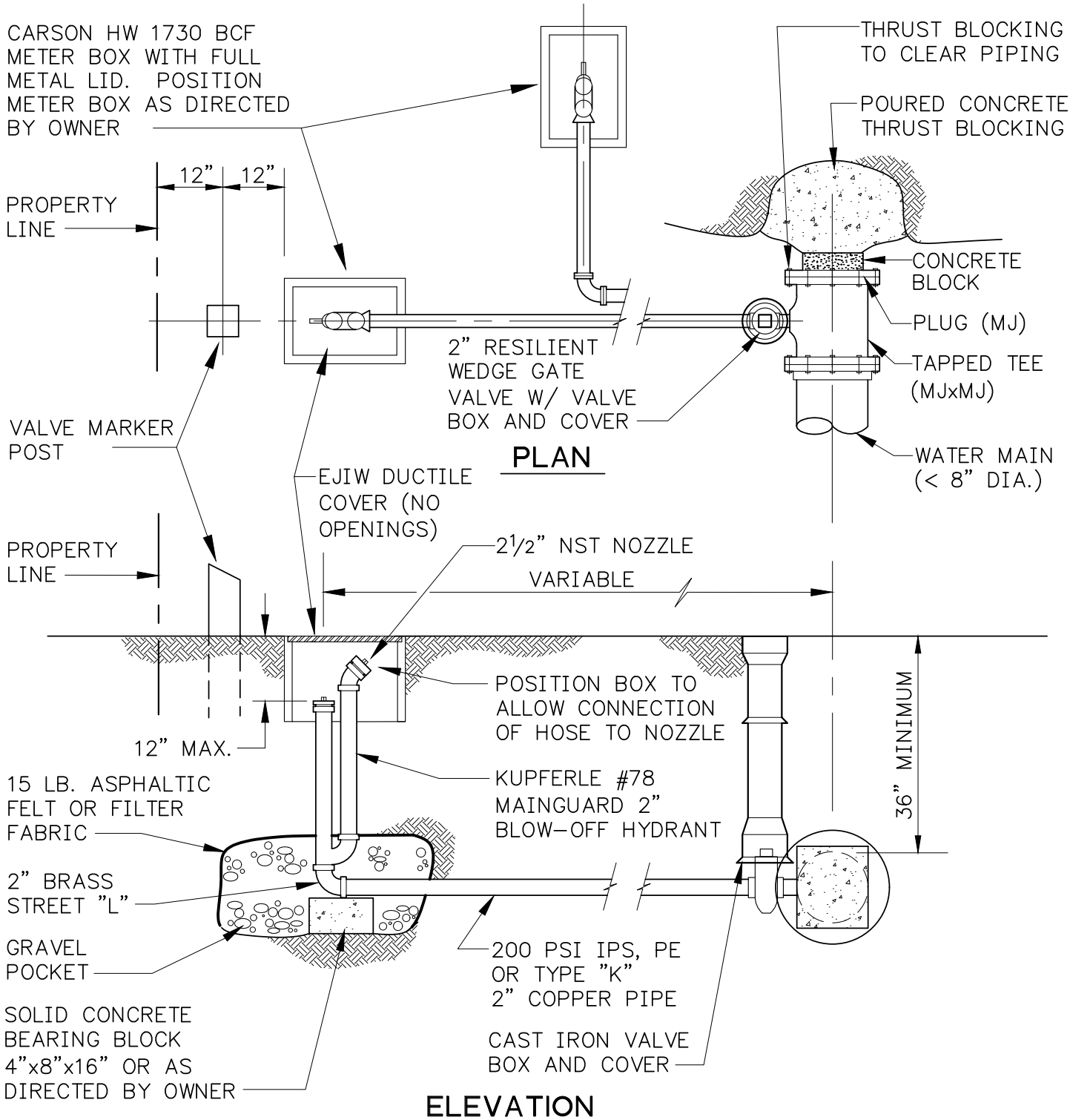
3 TYPE C HYDRANT ASSEMBLY



NOTES:

1. VALVE AND PIPING TO VALVE TO BE 2" UNLESS OTHERWISE NOTED ON PLAN.
2. LOCATE AT HIGH POINT OF MAIN.
3. TAP TOP OF MAIN.
4. VALVE MARKER POST TO BE PAINTED PER DISTRICT STANDARD. DISTRICT TO DETERMINE LOCATION.
5. WHERE BRAND NAME MATERIALS ARE CALLED OUT, EQUAL PRODUCTS ARE ACCEPTABLE

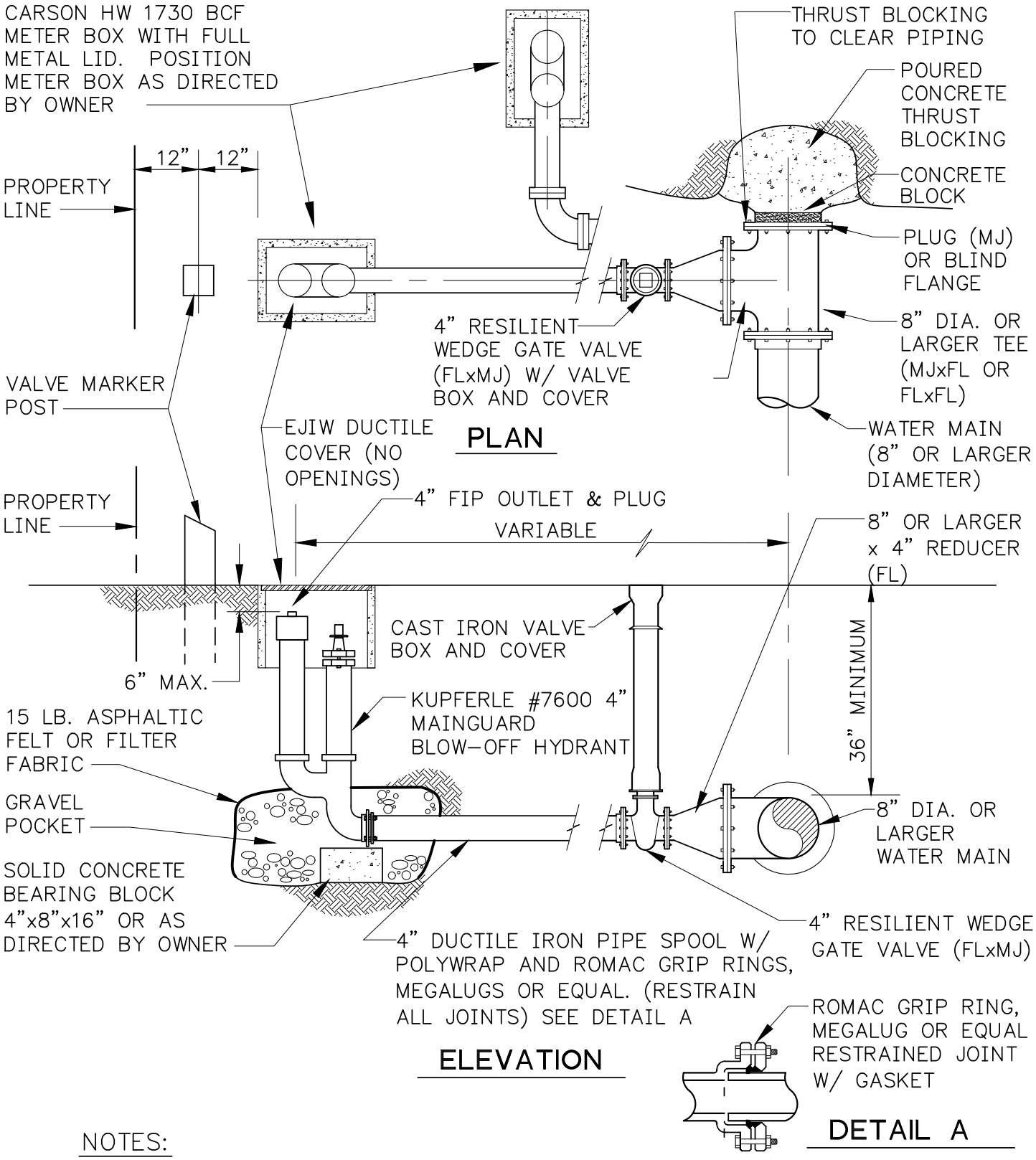
4 AIR RELEASE VALVE ASSEMBLY



NOTES:

1. PAINT PIPE THREADS WITH ASPHALT PAINT AFTER ASSEMBLY.
2. VALVE AND ALL FITTINGS TO BE BRASS.
3. PIPING TO VALVE TO BE 2" UNLESS OTHERWISE NOTED ON PLAN.
4. PAINT VALVE MARKER POST PER OWNER REQUIREMENTS.
5. 2" BLOWOFF ASSEMBLY TO BE USED ON WATER MAINS < 8" DIA.
6. WHERE BRAND NAME MATERIALS ARE CALLED OUT, EQUAL PRODUCTS ARE ACCEPTABLE, FOR METER BOXES.

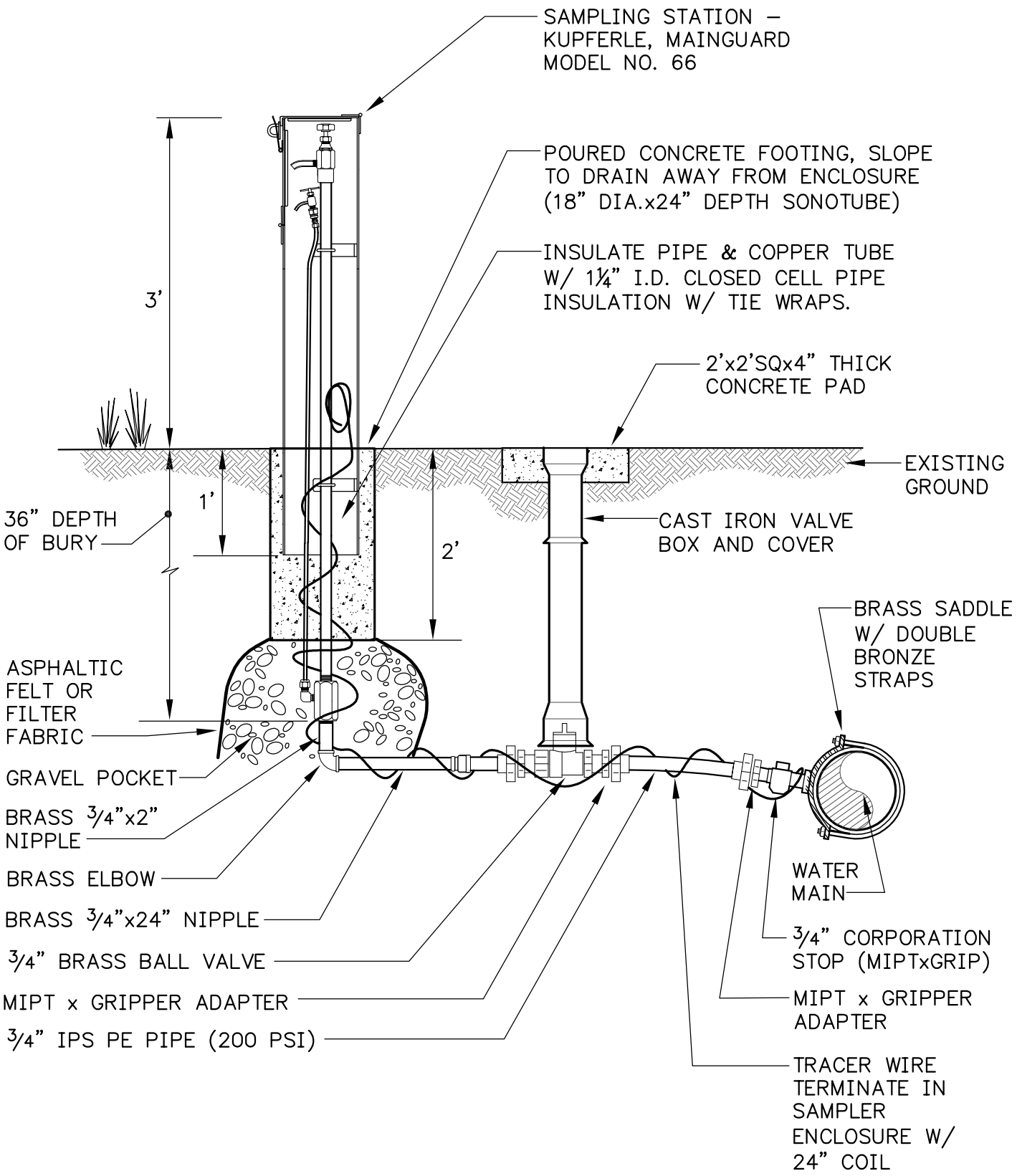
5A 2" BLOWOFF ASSEMBLY



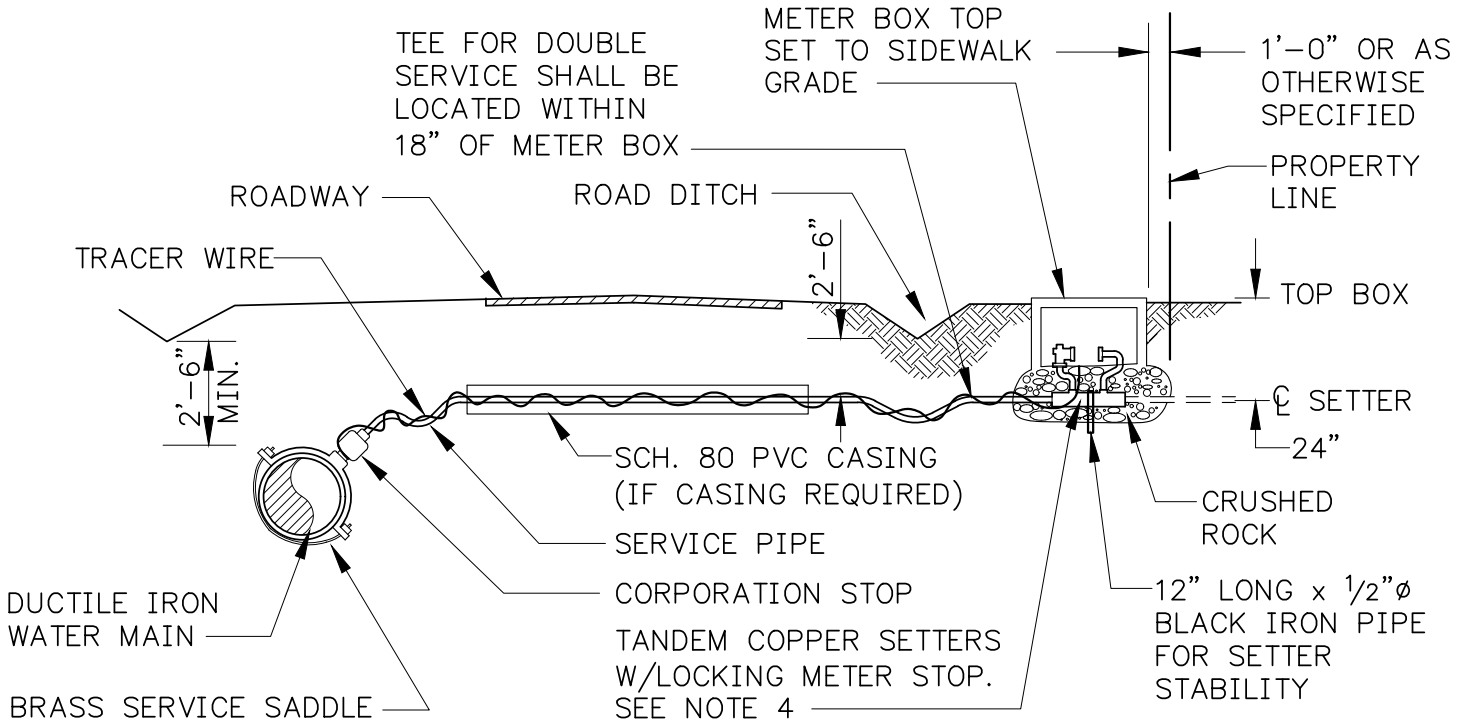
NOTES:

1. CONTRACTOR SHALL SPECIFY DEPTH OF COVER WHEN ORDERING EACH BLOWOFF.
2. PIPING TO VALVE TO BE 4" UNLESS OTHERWISE NOTED ON PLAN.
3. PAINT VALVE MARKER POST PER OWNER REQUIREMENTS.
4. 4" BLOWOFF ASSEMBLY TO BE USED ON 8" DIAMETER OR LARGER WATER MAINS.
5. WHERE BRAND NAME MATERIALS ARE CALLED OUT, EQUAL PRODUCTS ARE ACCEPTABLE, FOR METER BOXES.

5B 4" BLOWOFF ASSEMBLY



6 SAMPLING STATION



PARTS FOR SINGLE SERVICE

- 1–1" IPT x MAIN SIZE ALL BRASS SERVICE SADDLE
- 1–1" BRASS MIPT x GRIPPER CORPORATION STOP (FORD F–1101G)
- 1–¾" BRASS MIPT x 1" GRIPPER ADAPTER (FORD C86–33G)
- 1–¾"x12" COPPER SETTER WITH LOCKING METER STOP AND DUAL CHECK VALVE (FORD VBHC72–12W–11–33 DP x DP)
- 1–¾" BRASS MALE x 1" INSERT ADAPTER (FORD PTM–21) – TAPE END
- 1–HDPE METER BOX (11"x11"x18", CARSON HW BCF)
- 1–HDPE METER BOX LID (11"x18", PER NOTE 5)

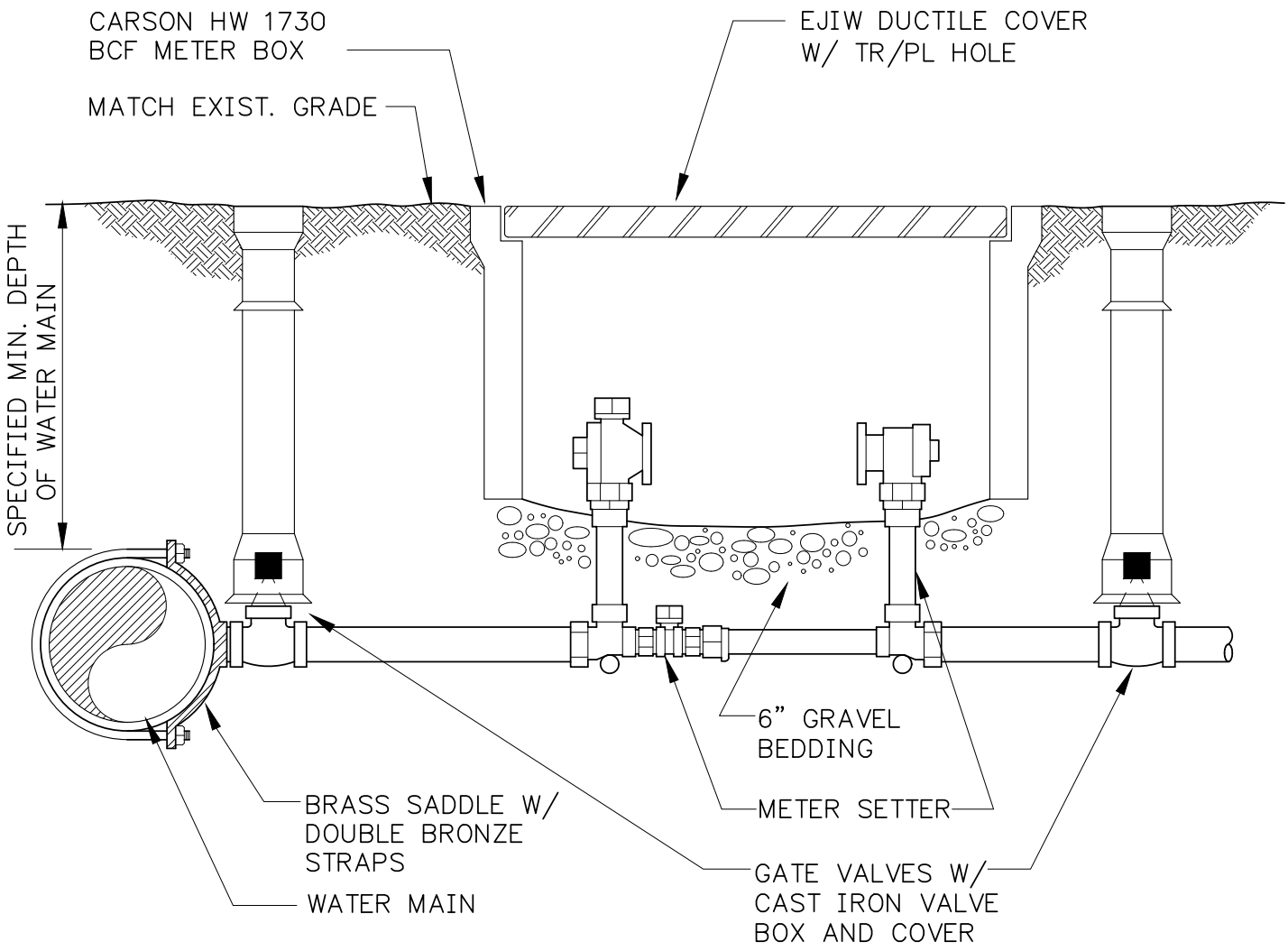
PARTS FOR DOUBLE SERVICE

- 1–1" IPT x MAIN SIZE ALL BRASS SERVICE SADDLE
- 1–1" BRASS MIPT x GRIPPER CORPORATION STOP (FORD F–1101G)
- 1–1" BRASS GRIPPER TEE ¾"x¾"x1" (FORD T666–334G)
- 2–¾" BRASS STREET ELLS
- 2–¾" BRASS MIPT x GRIPPER ADAPTER (FORD C86–33G)
- 2–¾"x12" COPPER SETTERS WITH LOCKING METER STOPS AND DUAL CHECK VALVES (FORD VBHC72–12W–11–33 DP x DP)
- 2–¾" BRASS MIPT x 1" INSERT ADAPTERS (FORD PTM–1) – TAPE ENDS
- 2–HDPE METER BOX (11"x11"x18", CARSON HW BCF)
- 2–HDPE METER BOX LID (11"x18", PER NOTE 5)

NOTES:

1. WATER SERVICE LINE SHALL BE 200 PSI IPS PE 4710, ASTM D–2239.
2. USE BRASS SADDLE WITH DOUBLE BRONZE STRAPS ON MAINS 4" AND LARGER (FORD 202B).
3. WHERE BRAND NAME MATERIALS ARE CALLED OUT, EQUAL PRODUCTS ARE ACCEPTABLE.
4. INSERT 12" LONG, 1/2" DIA. IRON PIPE HORIZONTALLY THROUGH SETTER BASE FOR STABILITY.
5. SIGMA, BLACK, DISTRICT LOGO, TAPPED FOR BADGER/ORION, N1118BLKBBY–THO.

7 ¾" AND 1" WATER SERVICE



PARTS FOR 1½" AND 2" SERVICE

1 – BRASS SADDLE WITH DOUBLE BRONZE STRAPS (FORD 202B OR EQUAL)

4 – FORD PACKJOINT COUPLINGS/PLASTIC PIPE

SETTERS: 1½" FORD VBH6612BX LENGTH WITH LOCKING BYPASS
2" FORD VBH7712BX LENGTH WITH LOCKING BYPASS
(SETTER LENGTH WILL BE DETERMINED BY DISTRICT)

HDPE CARSON METER BOX HW 1730 WITH DUCTILE COVER WITH TR/PL HOLE

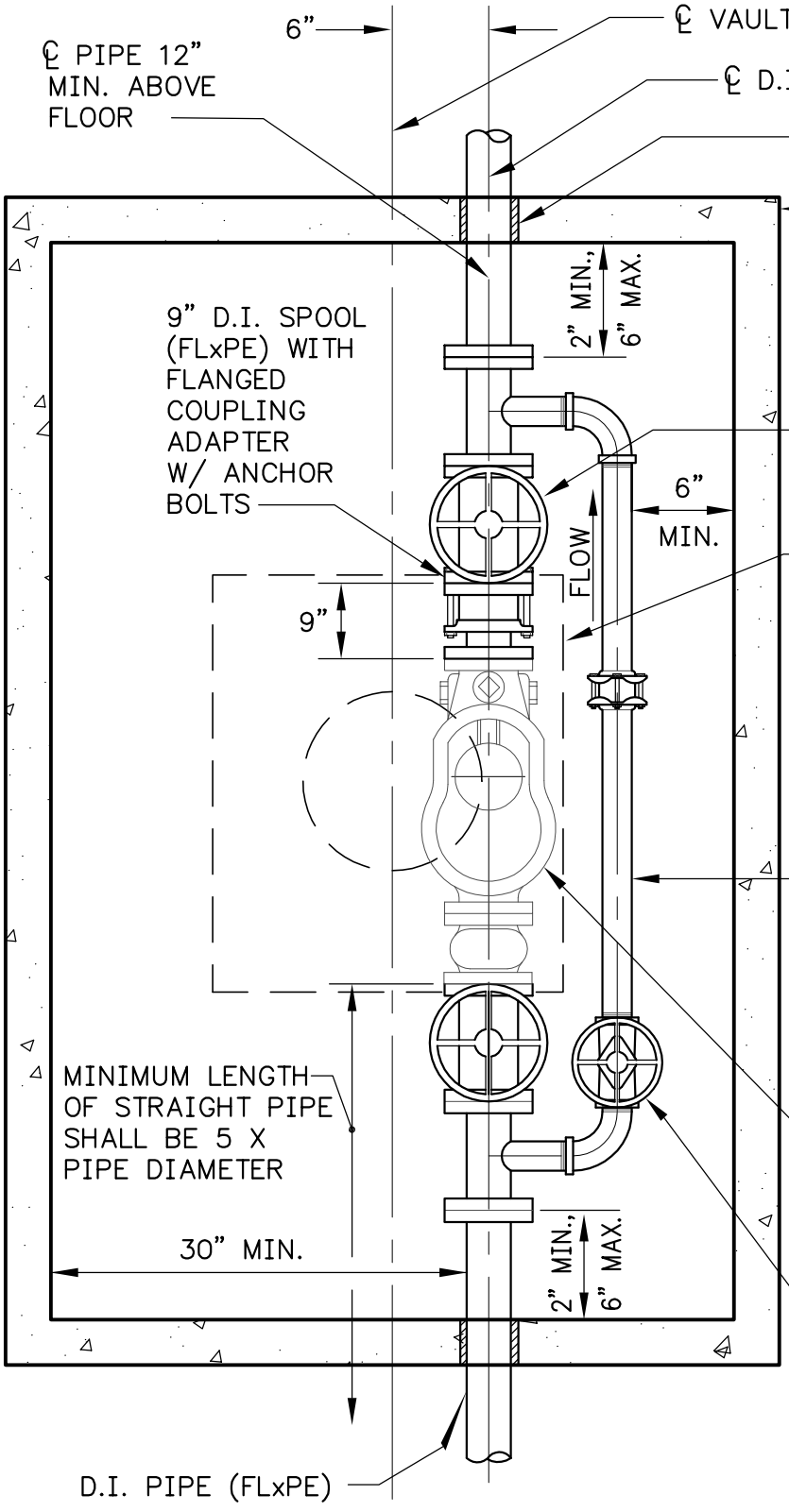
2 – GATE VALVES: 2 INCH–RESILIENT WEDGE SEATED (APWA C–509)
1½ INCH–BRASS

2 – CAST IRON VALVE BOX WITH COVER

WATER SERVICE LINE 200 PSI IPS PE 4710, ASTM D–2239

NOTE:
WHERE BRAND NAME MATERIALS ARE CALLED OUT,
EQUAL PRODUCTS ARE ACCEPTABLE

8 1½" AND 2" WATER SERVICE



NOTE:
LOCATE ALL ADAPTERS, FILTERS, REDUCERS NOT SHOWN ON THIS DETAIL OUTSIDE OF THE VAULT.

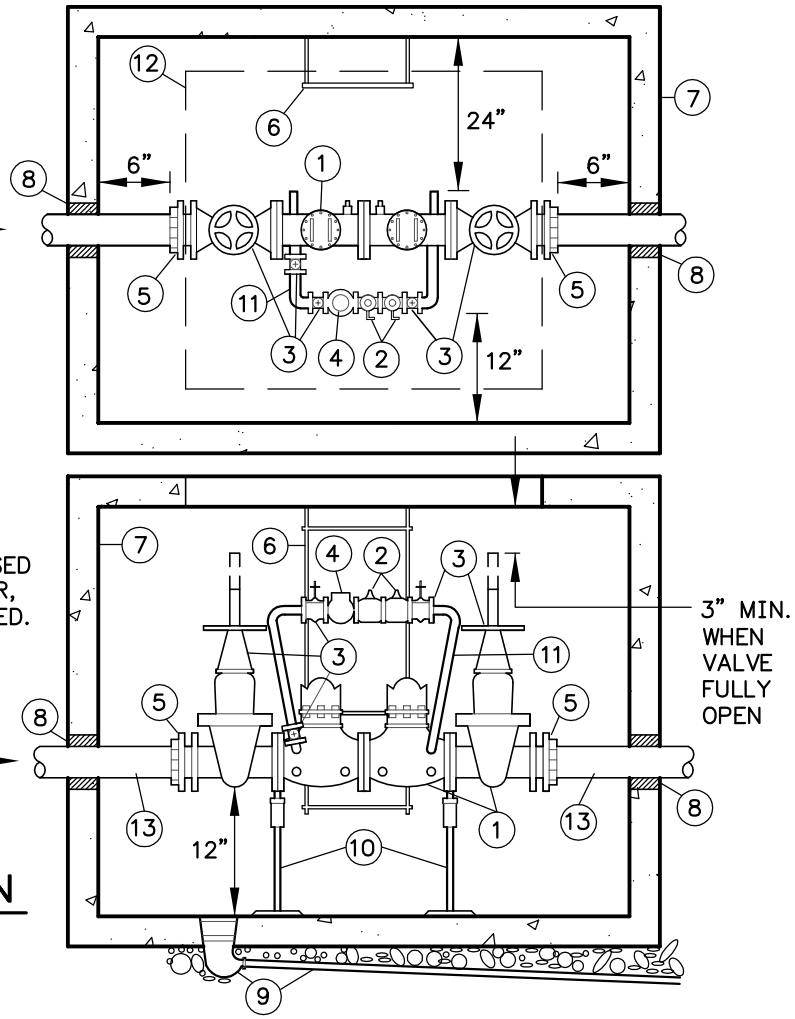
SIZE	MIN. VAULT SIZE (INSIDE) W	L	H	OLDCASTLE PRECAST MODEL
3"	4'-6"	6'-11"	2'-8"	675 WA
4"	4'-8"	7'-9"	2'-10'	687 LA

9 3" AND 4" WATER SERVICE

PLAN

NOTES:

1. DISTRICT WILL DETERMINE IF REDUCED PRESSURE PRINCIPAL DEVICE IS REQUIRED.
2. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER/CUSTOMER & ANNUAL CERTIFICATION REQUIRED.
3. FIRELINE SHALL NOT BE PUT INTO SERVICE UNTIL THE BACKFLOW PREVENTION ASSEMBLY IS APPROVED BY DISTRICT. CERTIFICATION FOLLOWING INSTALLATION REQUIRED.
4. VALVE ASSEMBLY TO BE CENTERED IN VAULT.
5. TEE & GATE VALVE REQUIRED ON MAIN.
6. WHEN DOUBLE CHECK VALVE ASSEMBLY IS USED IN SAME LINE W/ DOMESTIC BUILDING METER, METERED DETECTOR BYPASS SHALL BE OMITTED.
7. ALL CLEARANCES SHOWN ARE MINIMUM.
8. VAULTS SHALL NOT BE INSTALLED IN AREAS W/ VEHICULAR TRAFFIC.
9. UL/FM METER REQUIRED IF POTABLE SERVICE ALSO PROVIDED FROM FIRE PROTECTION SERVICE LINE.



ELEVATION

(1) STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY, COMPLETE W/ (2) RESILIENT SEATED O.S.&Y. VALVES & (4) RESILIENT SEATED TEST COCKS, & BRASS OR COPPER DETECTOR BY-PASS.

(2) STATE APPROVED 3/4" DOUBLE CHECK VALVE ASSEMBLY, COMPLETE W/ (2) RESILIENT SEATED BALL VALVES & (4) RESILIENT SEATED TEST COCKS.

(3) EACH VALVE SHALL BE MARKED W/ MODEL NUMBER W/ DESIGNATION OF RESILIENT SEAT: SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS BODIED VALVES SHALL BE COATED W/ A MIN. OF 4MLS. OF EPOXY OR EQUIVALENT POLYMERIZED COATING.

(4) 5/8"x3/4" METER (CUBIC FEET READING)-SENSUS METER W/ "TOUCH READ" SYSTEM

(5) UNI-FLANGE W/ SETSCREWS.

(6) ONE GALVANIZED STEEL LADDER TO BE SECURED TO VAULT.

(7) CONCRETE VAULT W/ A MIN. OF 2, 3'x3' ALUM. DIAMOND PLATE DOORS RATED FOR H20 LOADING, MARKED "WATER". DOORS SHALL BE LW HATCH OR EQUAL W/ SPRING LIFT & RECESSED PADLOCK HASP. PAINTED ALUM. SIGN TO BE MOUNTED ON UNDERSIDE OF HATCH "CONFINED SPACE. ENTRY BY PERMIT ONLY". VAULT SHALL BE EQUAL TO OLDCASTLE PRECAST MODEL LISTED IN TABLE BELOW.

(8) WATER TIGHT GROUT. RESTRAIN INLET/OUTLET PIPE W/ WELDED FLANGE OR ANCHOR BLOCKS.

(9) DRAIN, SLOPE TO DAYLIGHT WHERE APPLICABLE.

(10) TWO ADJUSTABLE PIPE STANCHIONS.

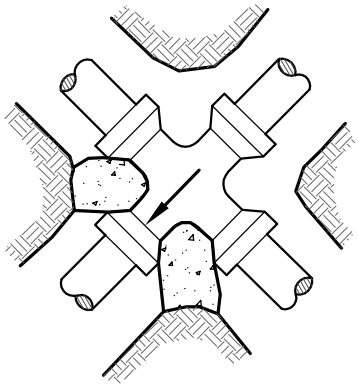
(11) ALL PLUMBING FOR BY-PASS TO BE COPPER & BRASS.

(12) ACCESS TO BE CENTERED OVER METER.

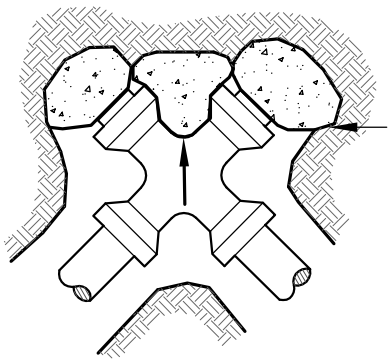
(13) CL. 52 D.I., M.J. W/ RETAINER GLANDS.

SIZE	MIN. VAULT SIZE (INSIDE) W	L	H	OLDCASTLE PRECAST MODEL	OLDCASTLE PRECAST COVER
3"	4'-2"	4'-8"	3'-3"	675-WA	675-2-332P
4"	4'-6"	5'-3"	3'-8"	675-WA	675-2-332P
6"	4'-8"	6'-6"	4'-5"	675-WA	675-2-332P
8"	5'-0"	7'-8"	5'-3"	687-LA	687-TL-2-332
10"	5'-2"	8'-8"	6'-1"	5106-LA	5106-TL3-332

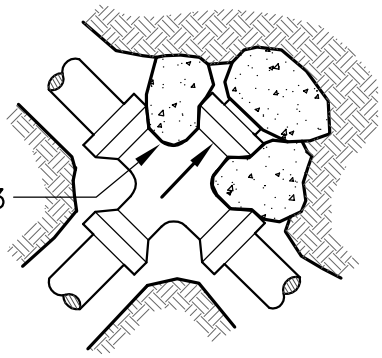
10 DOUBLE CHECK DETECTOR ASSEMBLY



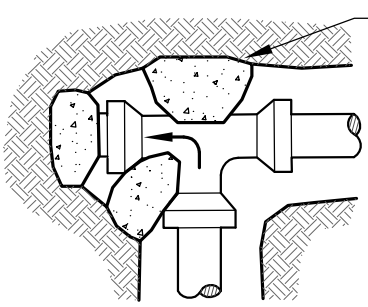
UNBALANCED CROSS



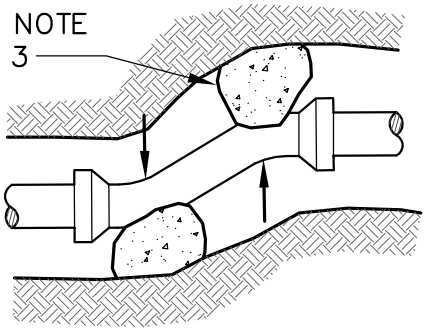
PLUGGED CROSS



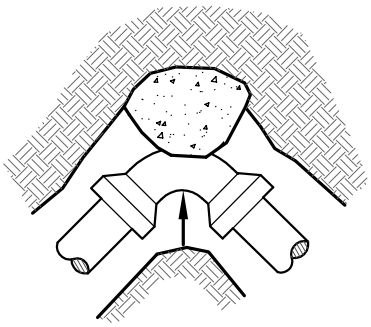
PLUGGED CROSS



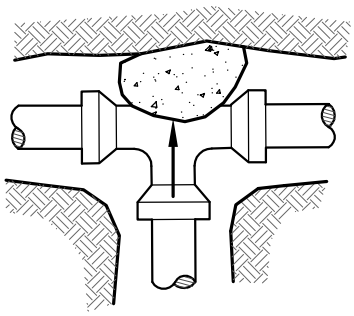
PLUGGED TEE



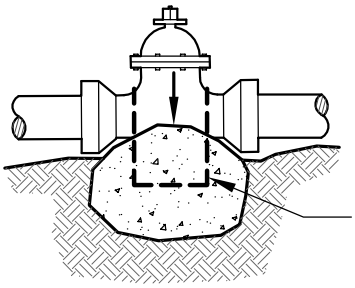
OFFSET



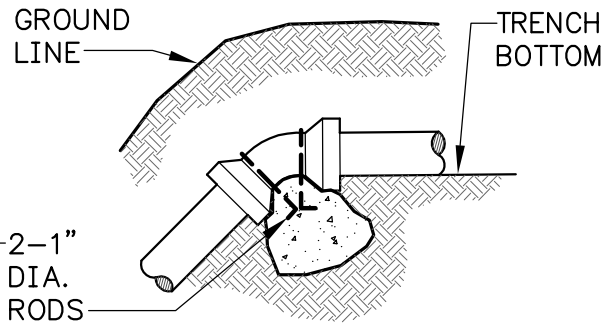
HORIZONTAL BEND



TEE



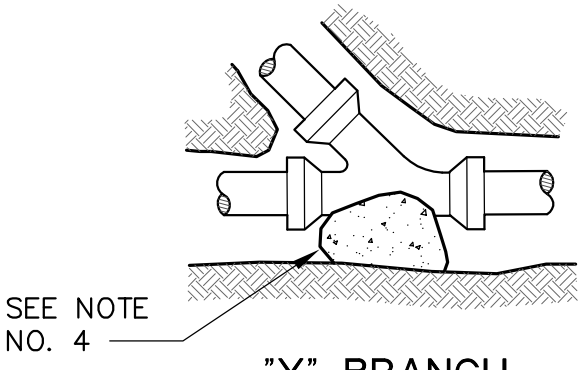
VALVE



VERTICAL BEND

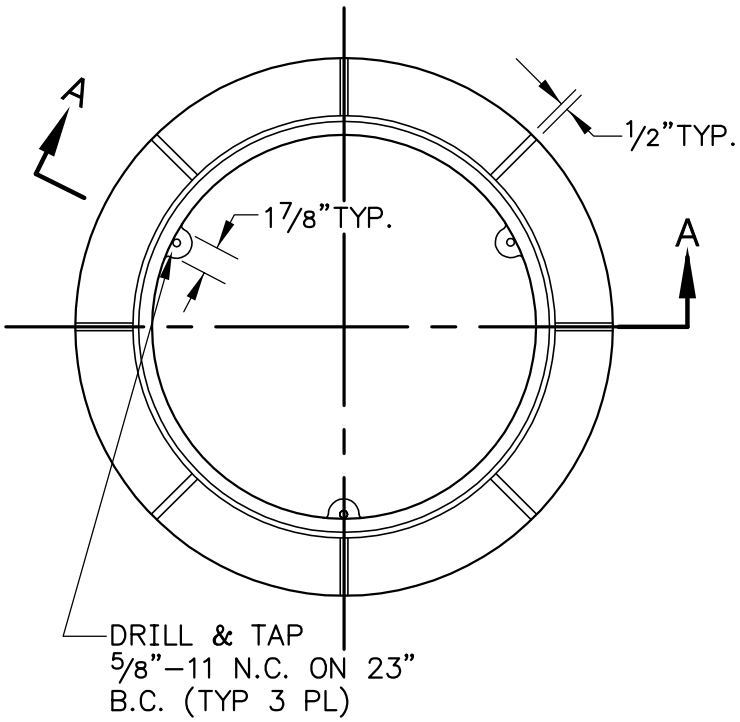
NOTES:

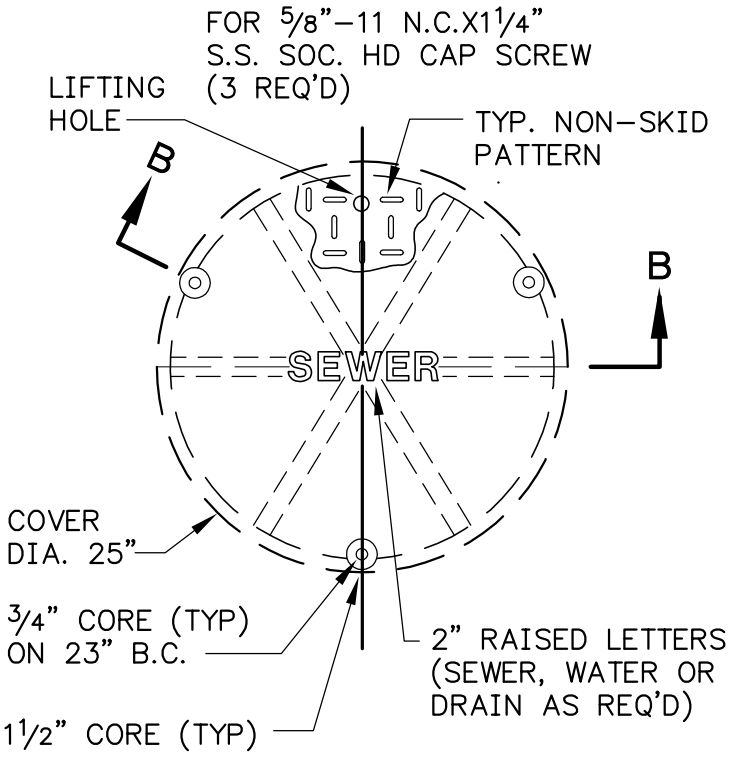
1. SIZE OF BLOCK TO BE DETERMINED BY THE CONTRACTOR, TO BE ADEQUATE FOR SOIL CONDITION AND PRESSURE INVOLVED.
2. ALL BLOCKING TO BE ON UNDISTURBED MATERIAL.
3. BLOCKING REQUIRED IF PLUGS NOT SECURED BY BOLTING OR ADEQUATE STRAPS.
4. BLOCKING SHALL NOT COVER BOLTS OR THREADS.

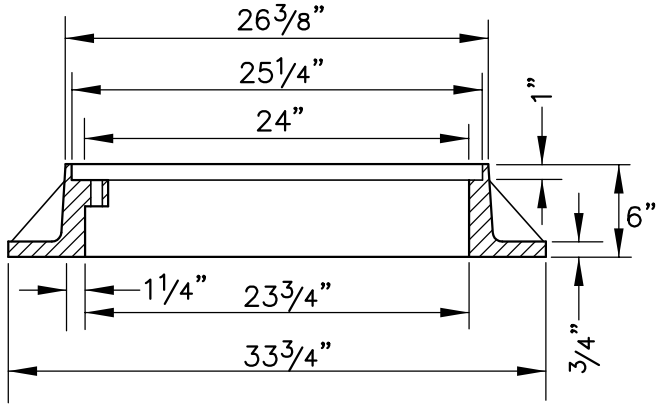


"Y" BRANCH

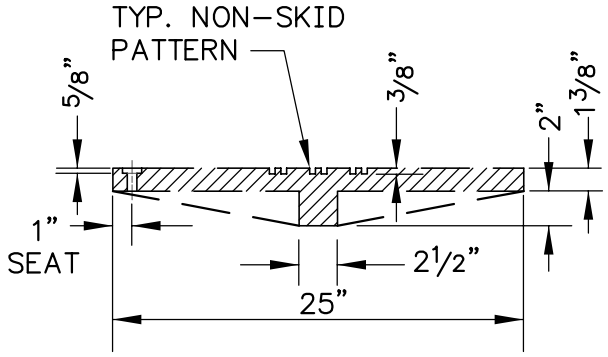
11 CONCRETE THRUST BLOCKING







SECTION A–A

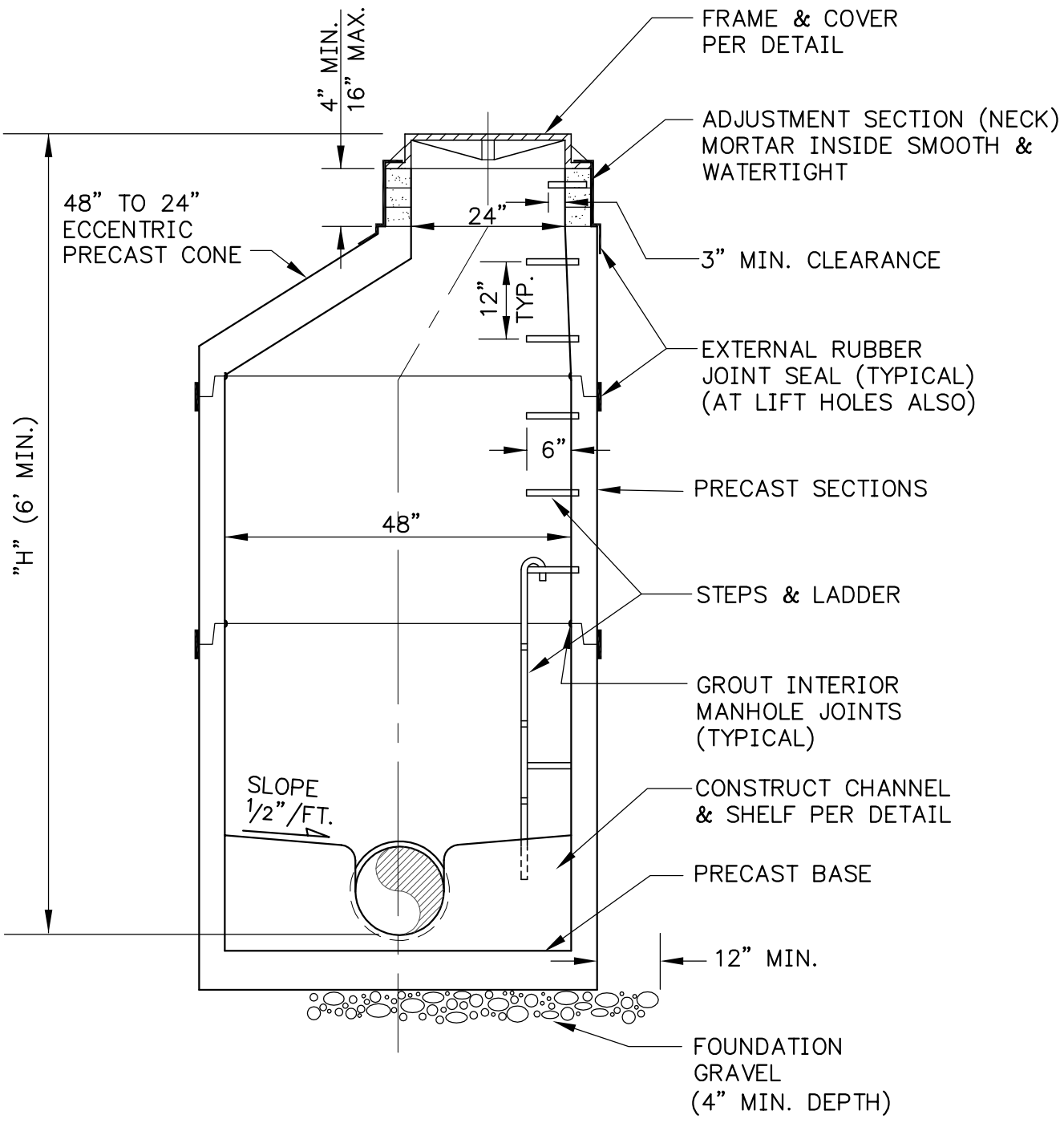


SECTION B–B

NOTES:

1. DRILL LUG HOLES FULL DEPTH
2. BOLT COVER TO LUGS IN RING
3. PROVIDE 7/8" LIFTING HOLE
4. DUCTILE IRON COVER, CAST IRON FRAME
5. SEE SPECIFICATION 02605 FOR ADDITIONAL REQUIREMENTS
6. FRAME AND COVER PER APWA

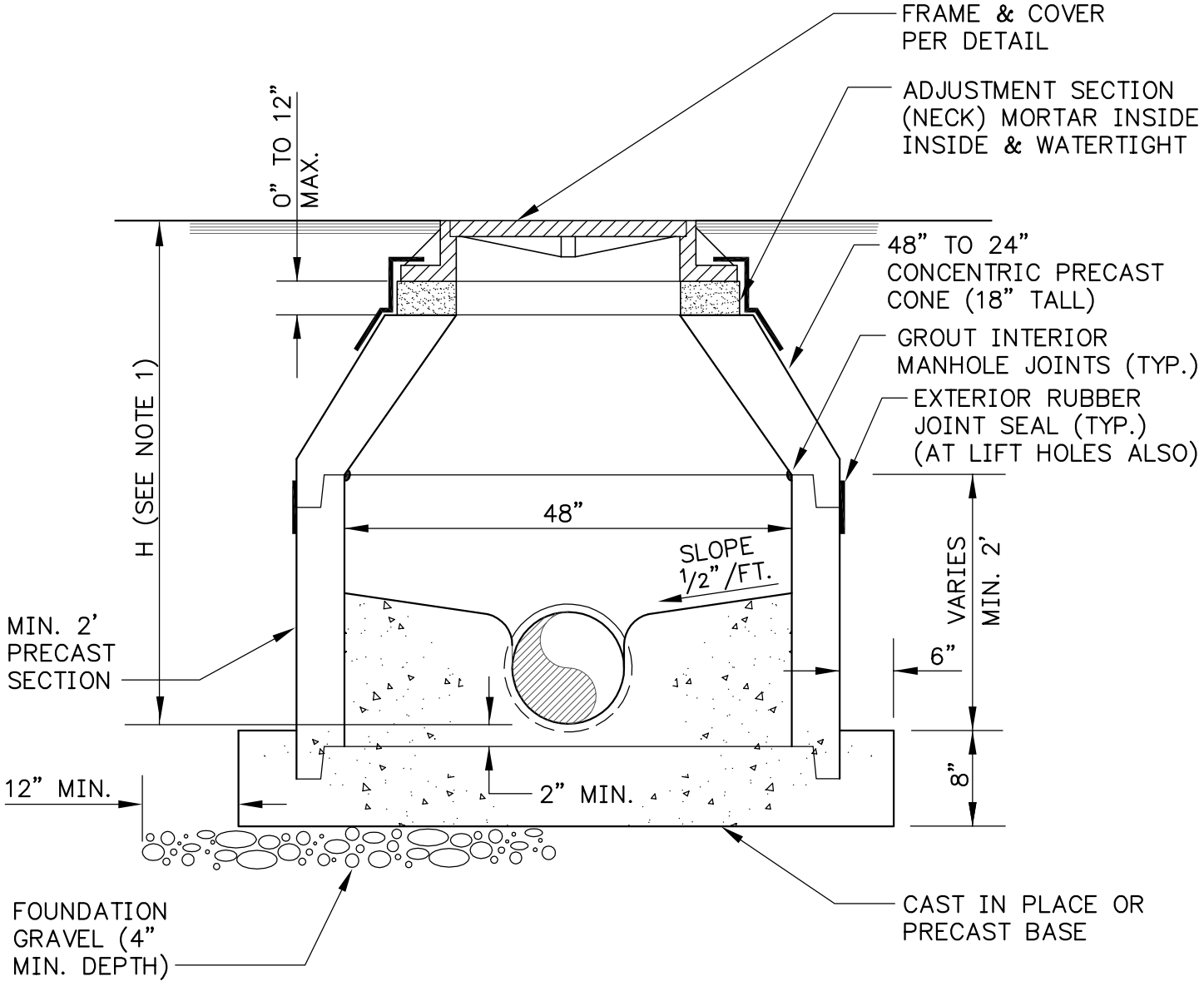
12 MANHOLE FRAME AND COVER



NOTES:

1. WALL OPENING REQUIREMENTS FOR PIPE:
   A. HOLE SIZE AS REQUIRED FOR KOR-N-SEAL WEDGE KORBAND PIPE CONNECTOR
   B. 8" MINIMUM BETWEEN HOLES
   C. MAXIMUM PIPE SIZE 21"

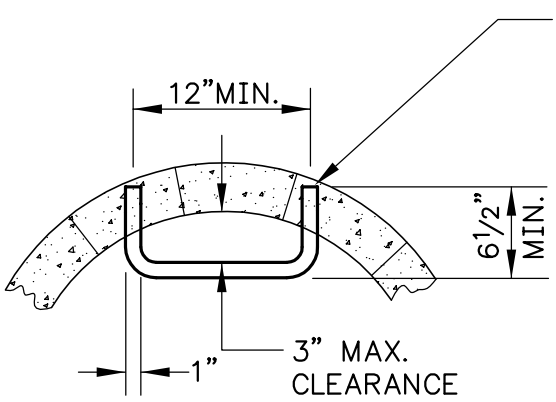
13 TYPE I - 48" MANHOLE



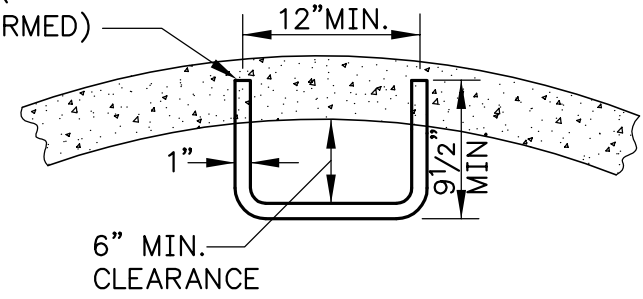
NOTES:

1. MAXIMUM H IS 5'. MINIMUM H IS 3'–8"
2. TO BE USED ONLY WITH PRIOR AUTHORIZATION
3. MAXIMUM PIPE SIZE 12"
4. HOLE SIZE AS REQUIRED FOR KOR–N–SEAL WEDGE KORBAND PIPE CONNECTOR
5. EXTERNAL JOINT SEAL SHALL BE "BEST SEAL" OR APPROVED EQUAL

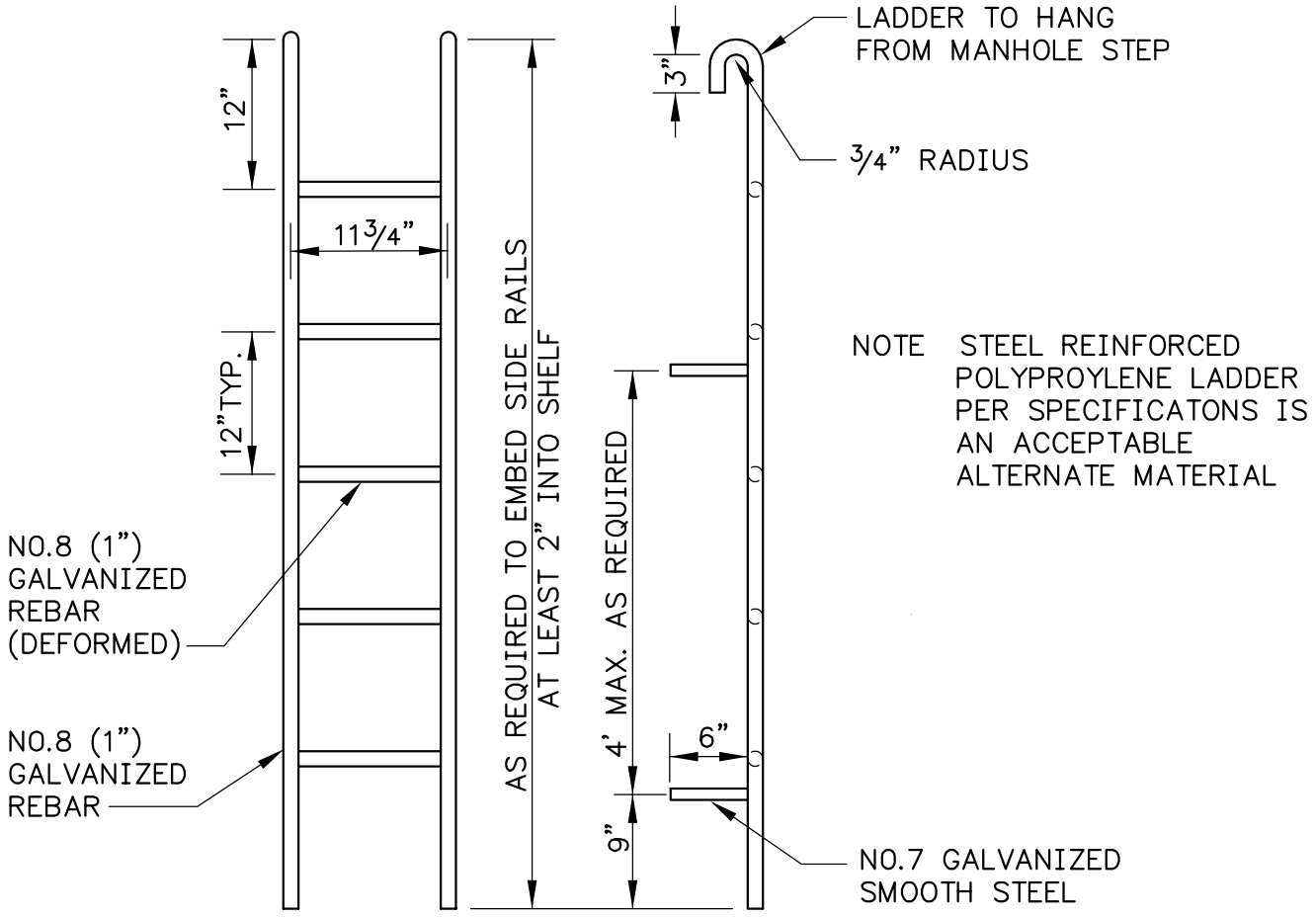
14 TYPE IIIA – 48" MANHOLE



ADJUSTMENT RING HAND HOLD

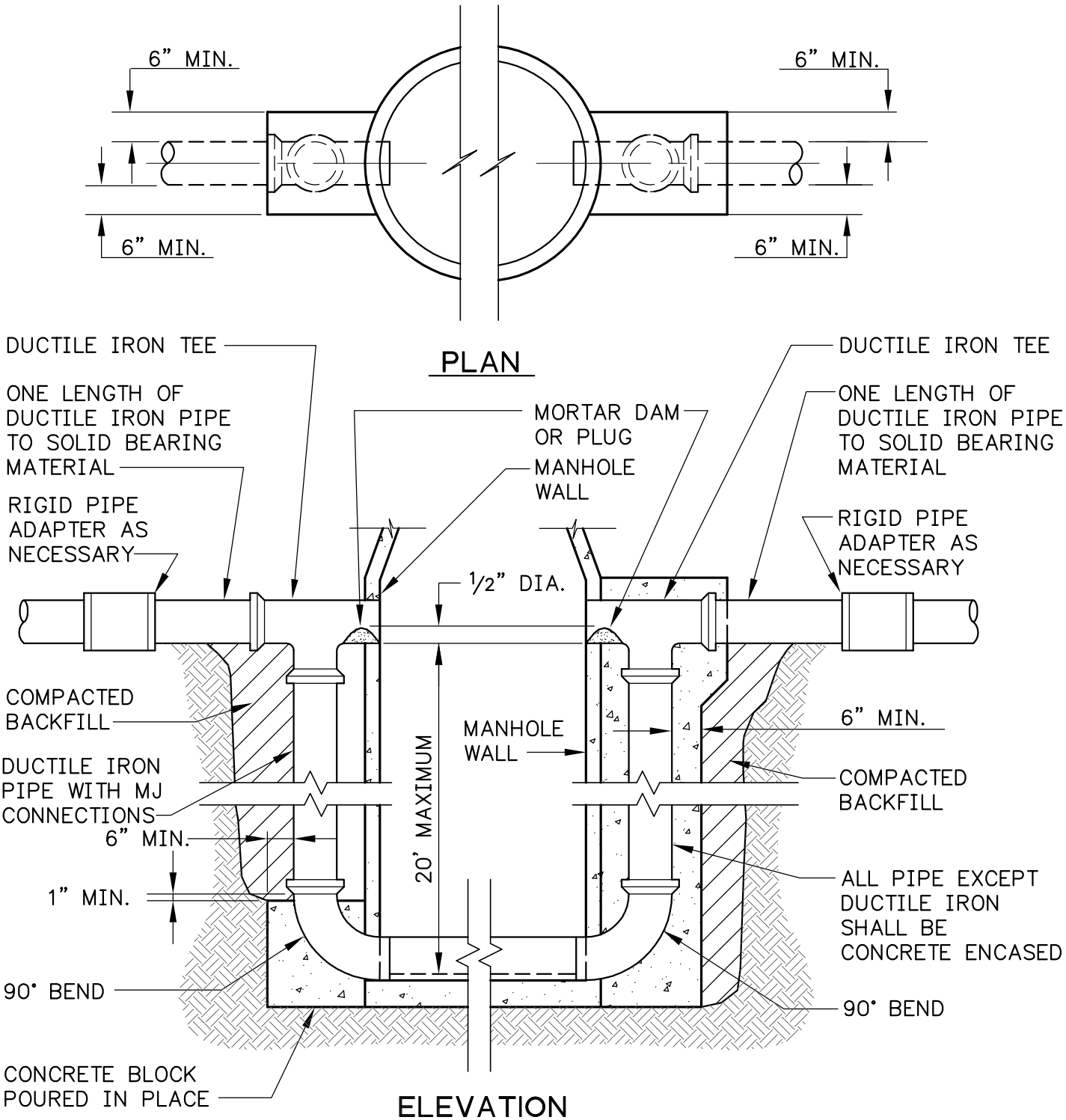


TYPICAL MANHOLE STEP



PREFABRICATED LADDER

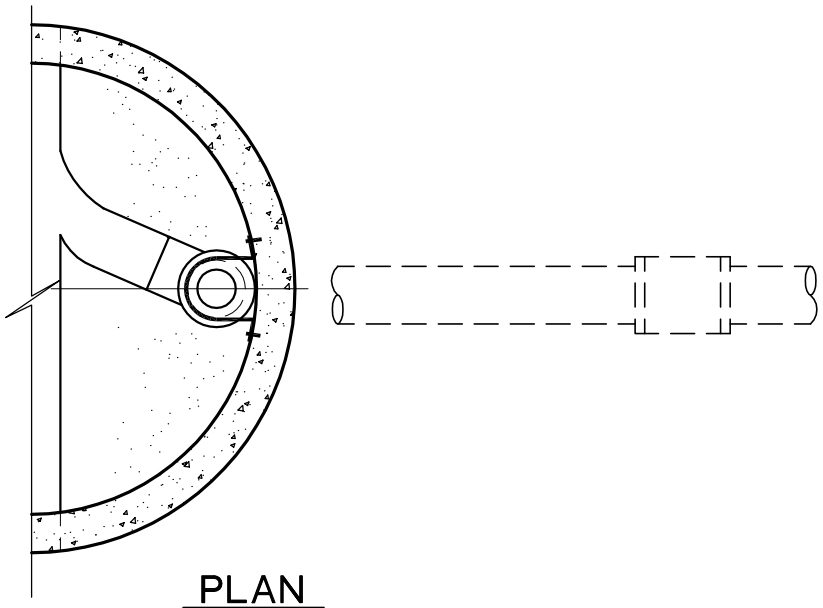
15 MANHOLE STEPS AND LADDER



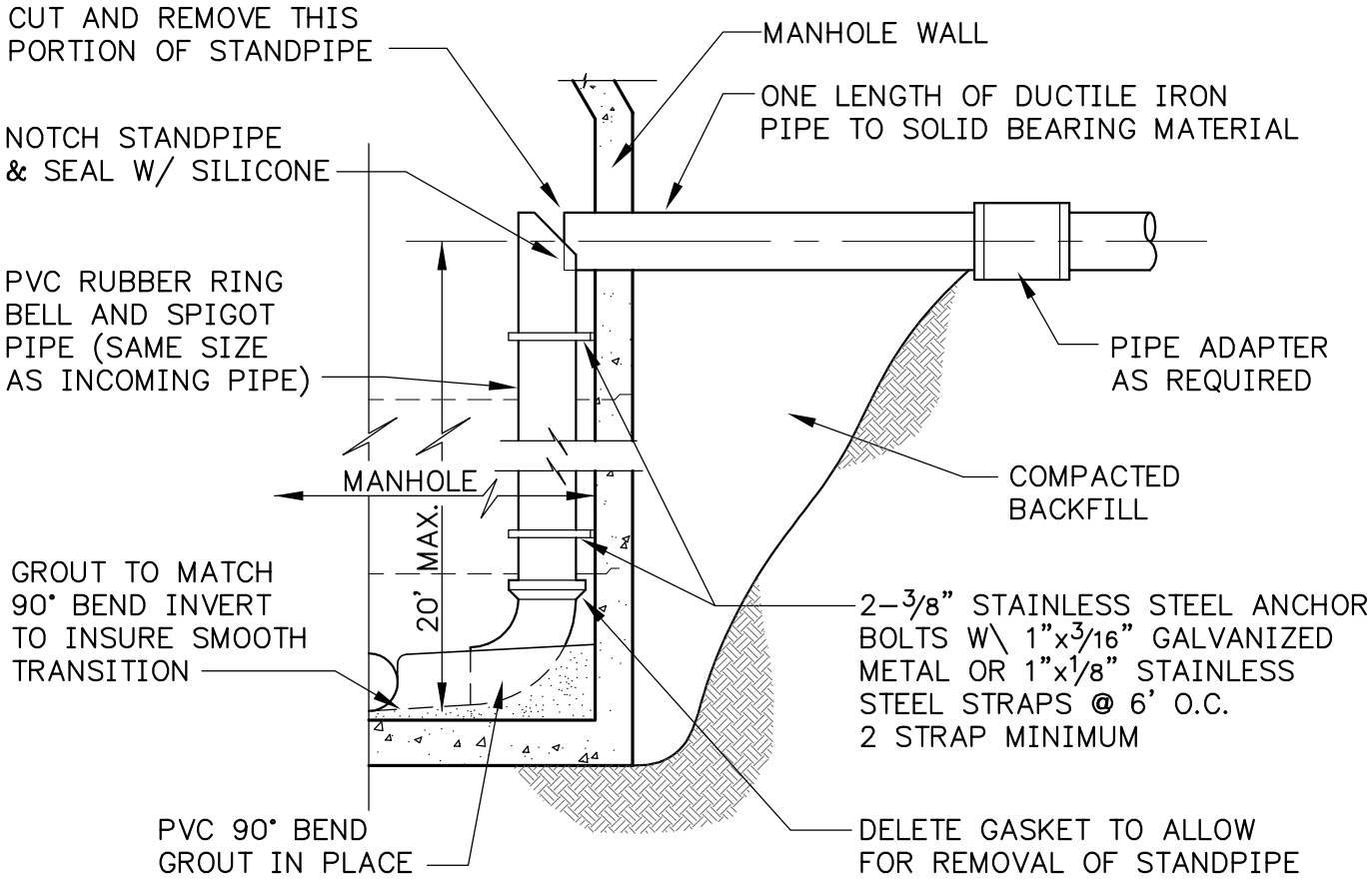
DUCTILE IRON ALTERNATIVE

CONCRETE ENCASED ALTERNATIVE

16 OUTSIDE DROP MANHOLE CONNECTION



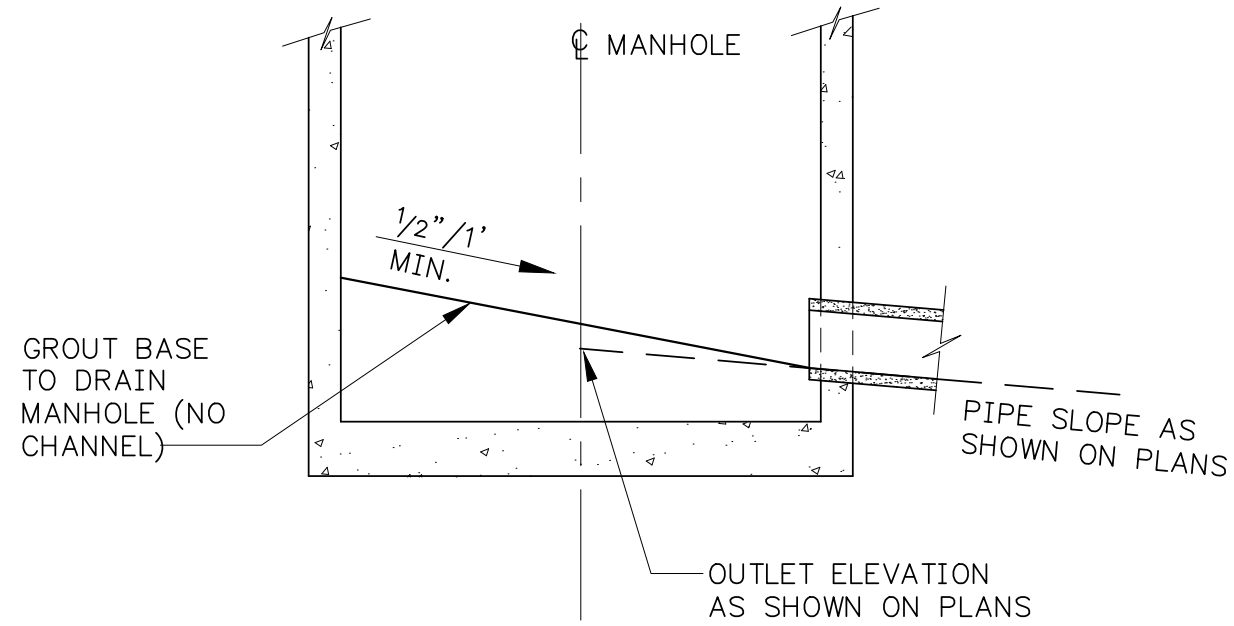
PLAN



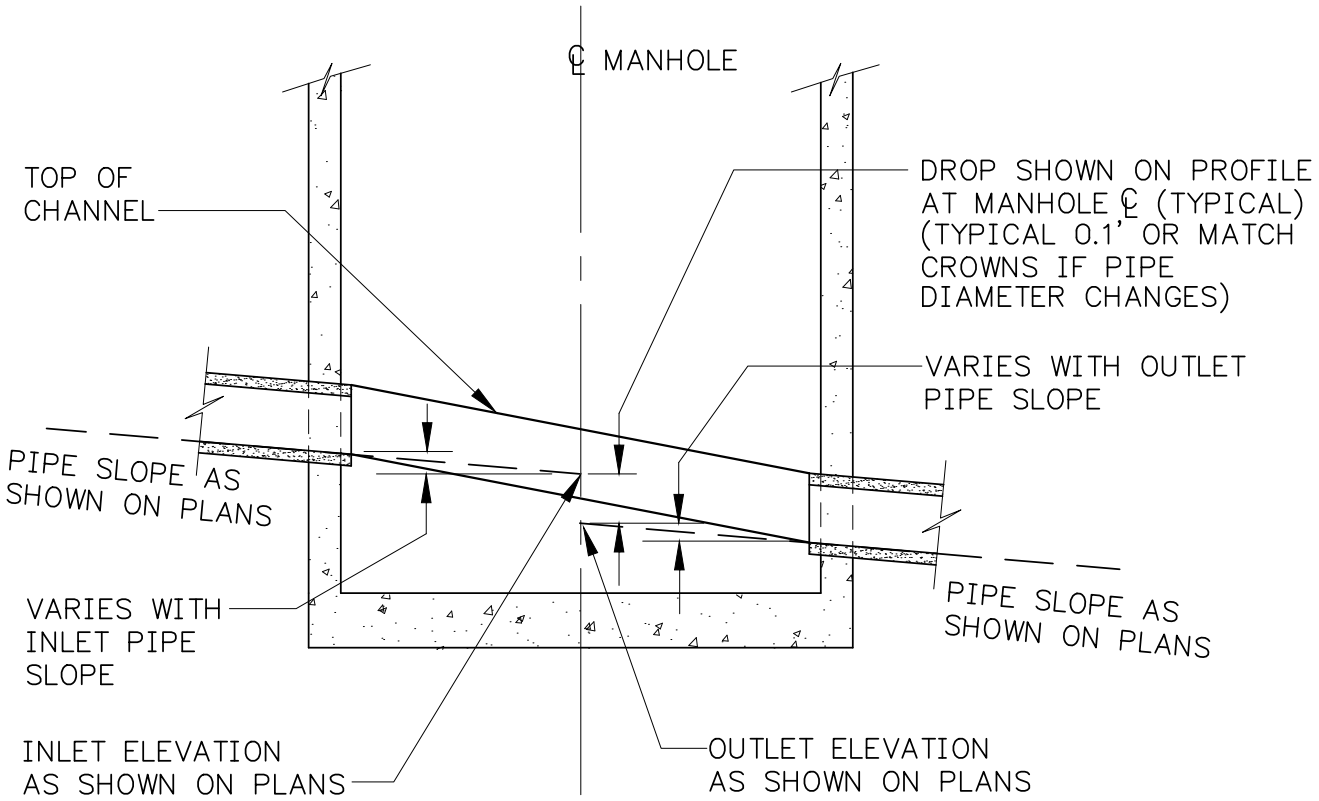
ELEVATION

NOTE: THIS ASSEMBLY TO BE USED ONLY WITH SPECIFIC AUTHORIZATION

17 INSIDE DROP MANHOLE CONNECTION

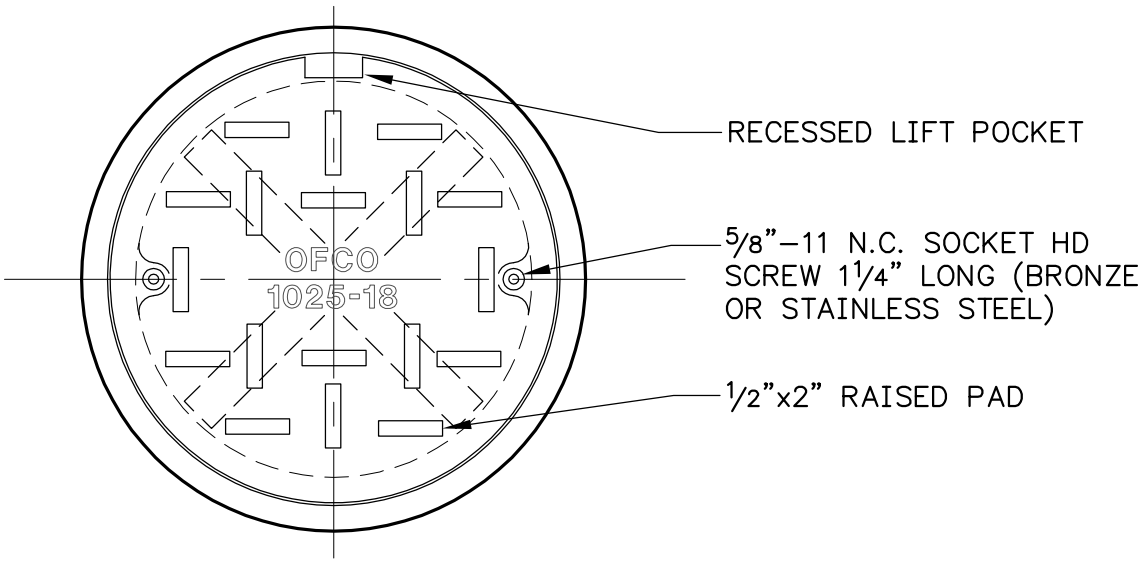


TERMINAL MANHOLE

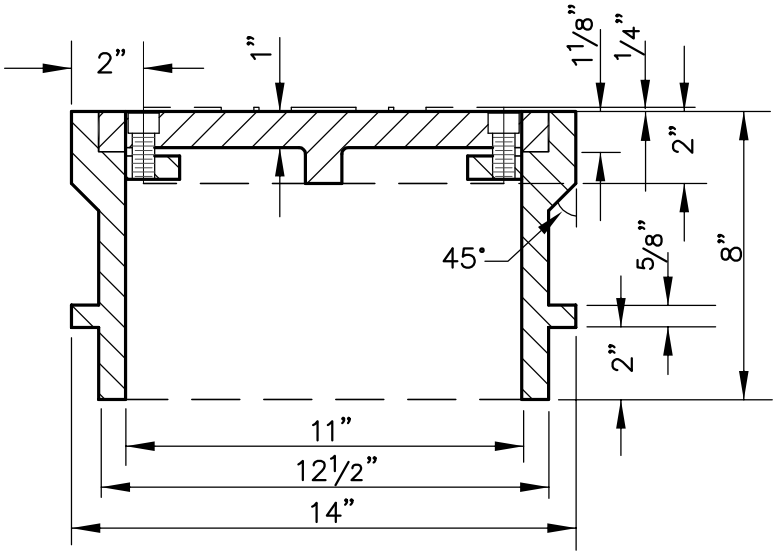


MAIN-LINE MANHOLE

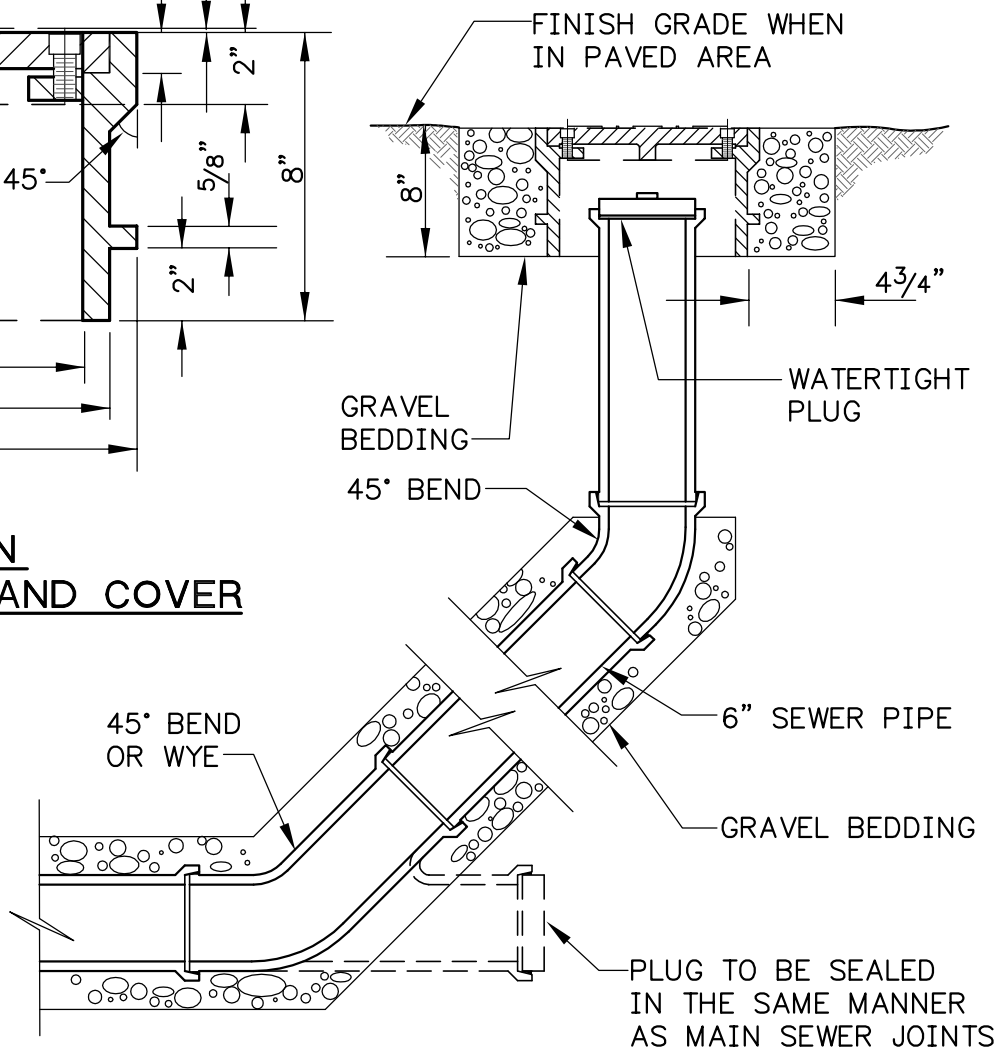
18 MANHOLE CHANNELING



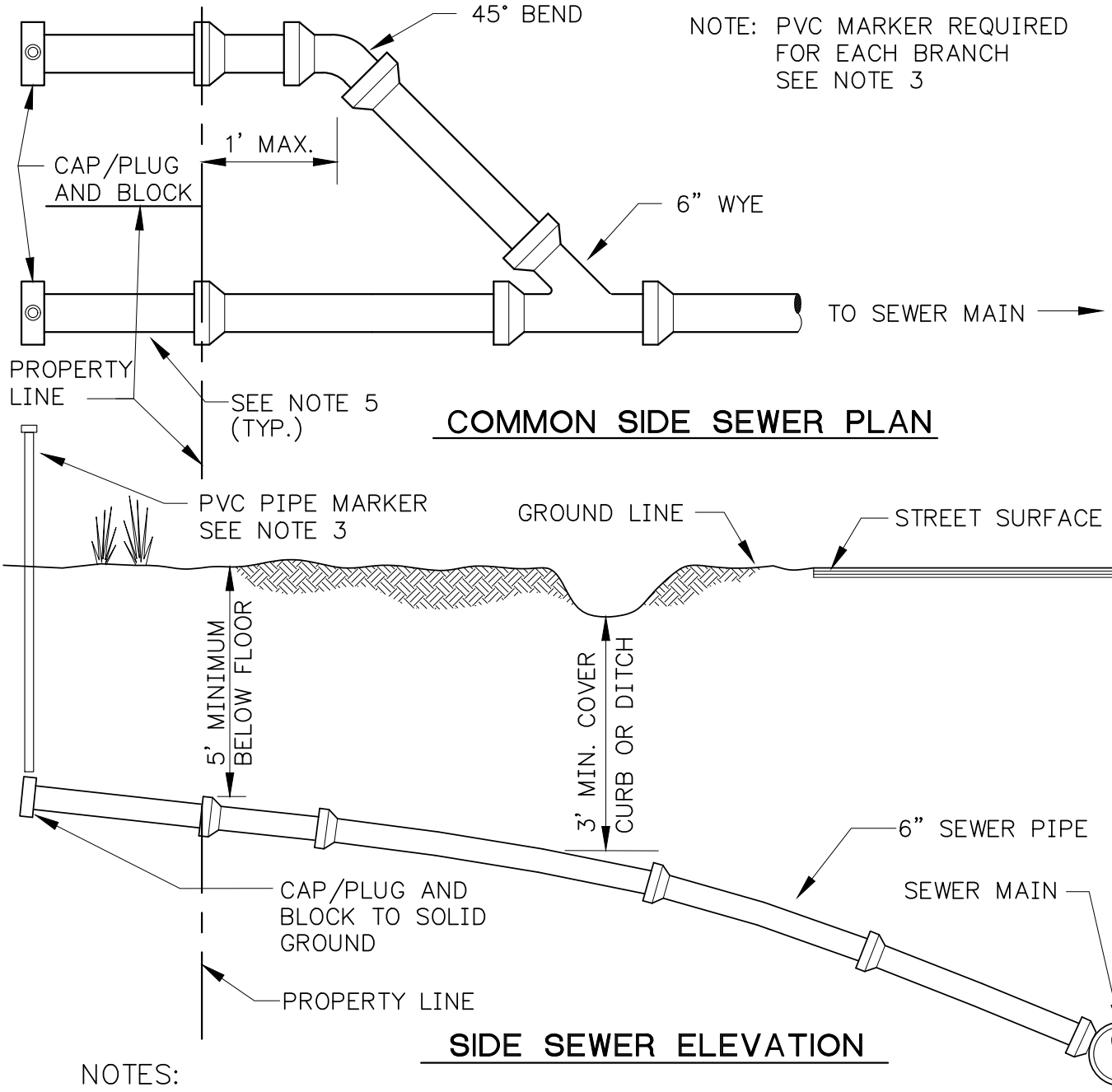
PLAN



ELEVATION
CAST IRON RING AND COVER



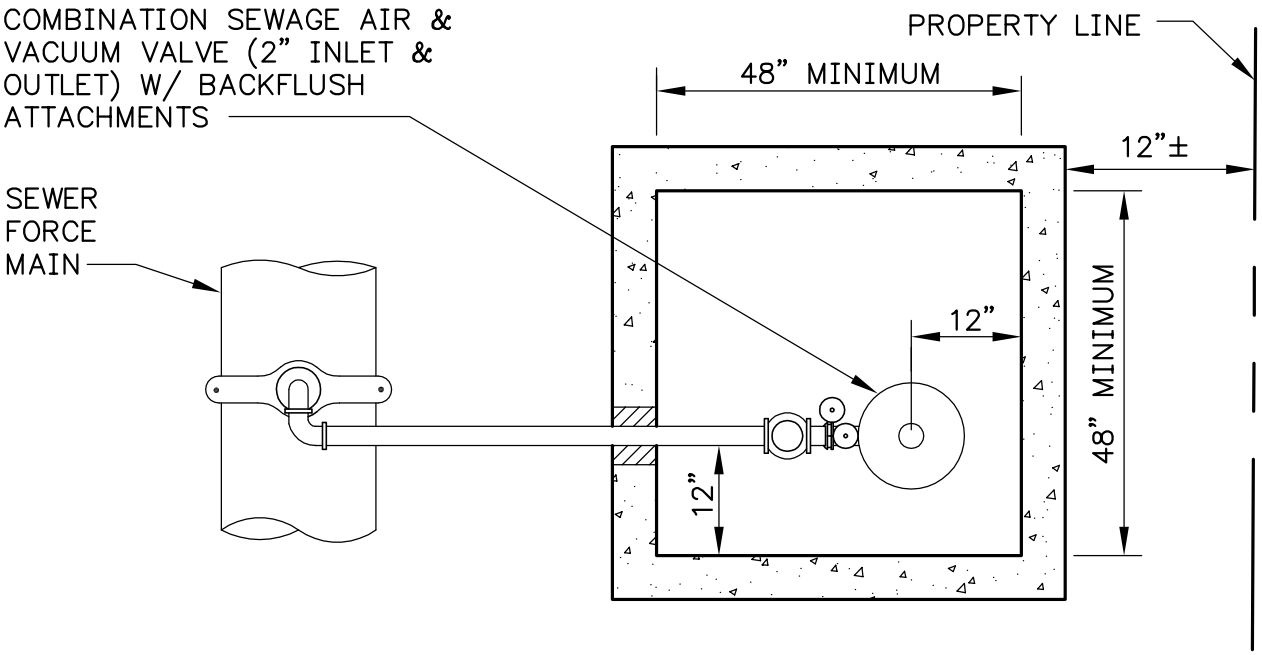
19 SEWER CLEANOUT



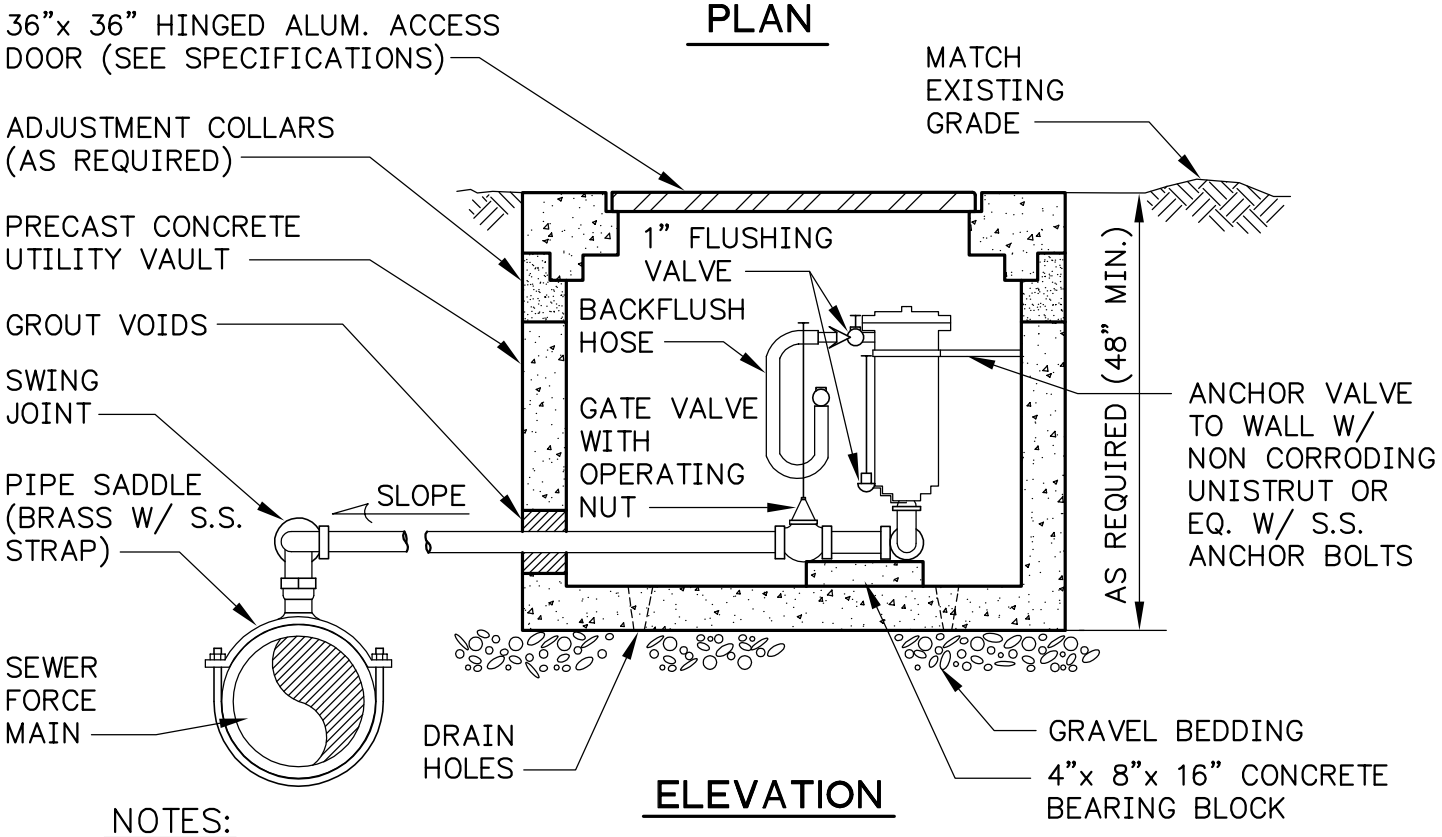
NOTES:

1. 6" MINIMUM SIZE PIPE TO PROPERTY LINE. MAXIMUM DEFLECTION PER JOINT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. MAXIMUM SLOPE = 2 VERTICAL : 1 HORIZONTAL, MINIMUM SLOPE = 2%
3. A 1¼" WHITE PVC PIPE, ASTM 2241 SDR 21 200 PSI SHALL BE PLACED VERTICALLY AT THE END OF EACH STUB AND SHALL RISE TWO FEET ABOVE FINISH GRADE LEVEL. BOTH ENDS OF THE PVC PIPE SHALL HAVE CAPS GLUED ON AND THE PIPE INTERIOR KEPT CLEAN, FOR THE PURPOSE OF FUTURE DEPTH MEASUREMENT.
4. PIPE AND FITTINGS SHALL BE PVC ASTM D3034.
5. PIPE MAY BE EXTENDED UPSTREAM OF PROPERTY LINE WHERE APPROVED BY DISTRICT, AT PROPERTY OWNER'S DISCRETION. TERMINATE WITH GASKETED CAP.
6. DISTRICT'S RESPONSIBILITY FOR SIDE SEWER IS LIMITED TO THAT PORTION IN THE SEWER EASEMENT OR PUBLIC RIGHT OF WAY.

20 STREET SIDE SEWER



PLAN



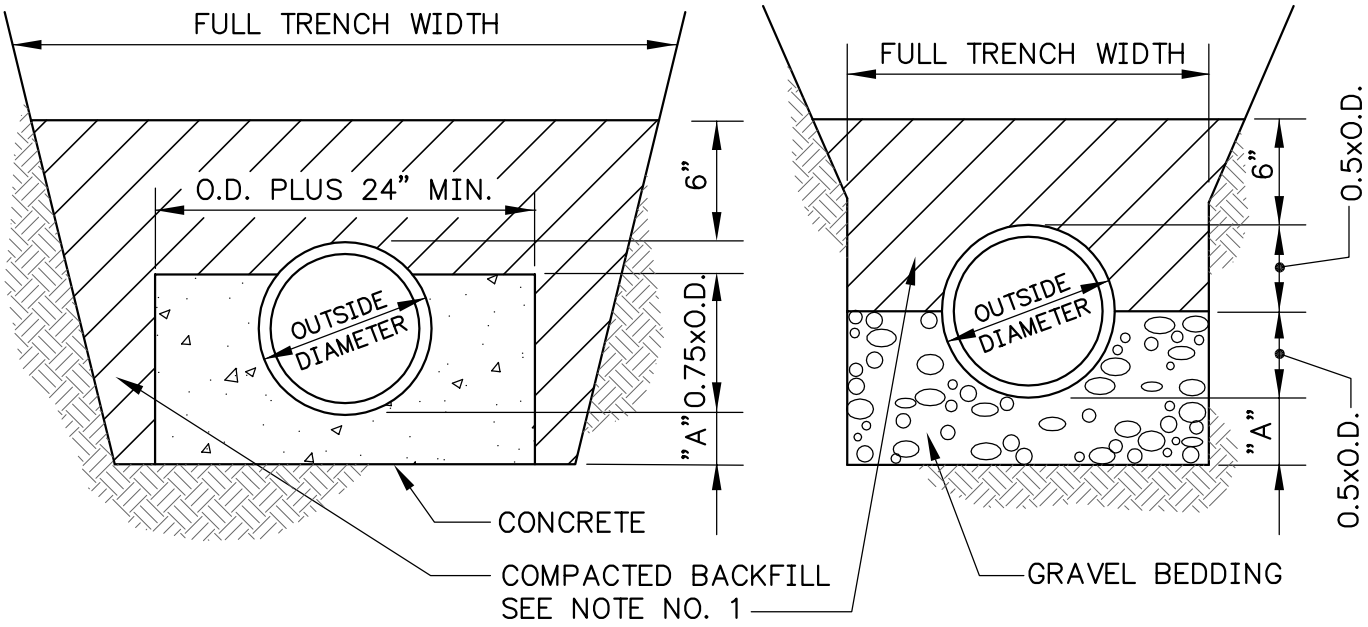
ELEVATION

NOTES:

1. PIPING TO VALVE AND VALVE TO BE 2" UNLESS OTHERWISE NOTED ON PLAN.
2. ALL PIPING TO BE BRASS.
3. PAINT PIPE THREADS WITH ASPHALT PAINT AFTER ASSEMBLY.
4. EXACT LOCATION OF VAULT AND AIR VACUUM RELEASE ASSEMBLIES TO BE DETERMINED BY ENGINEER AT TIME OF CONSTRUCTION.

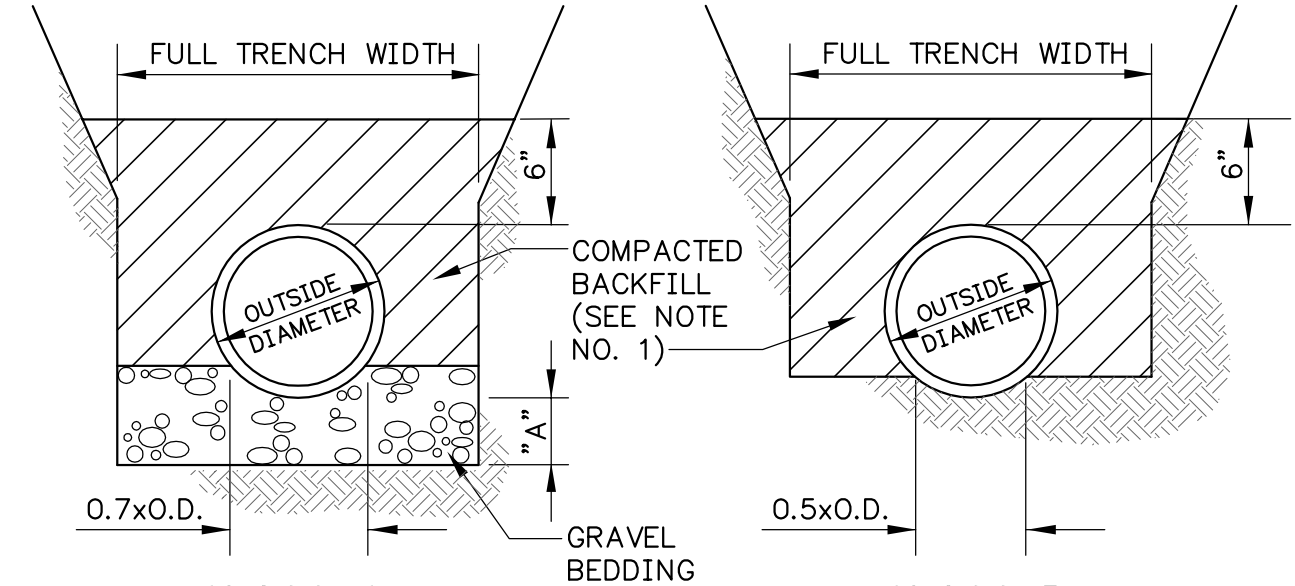
COMBINATION SEWER AIR AND VACUUM VALVE ASSEMBLY

21



CLASS A
CONCRETE BEDDING

CLASS B
NORMAL GRAVEL BEDDING



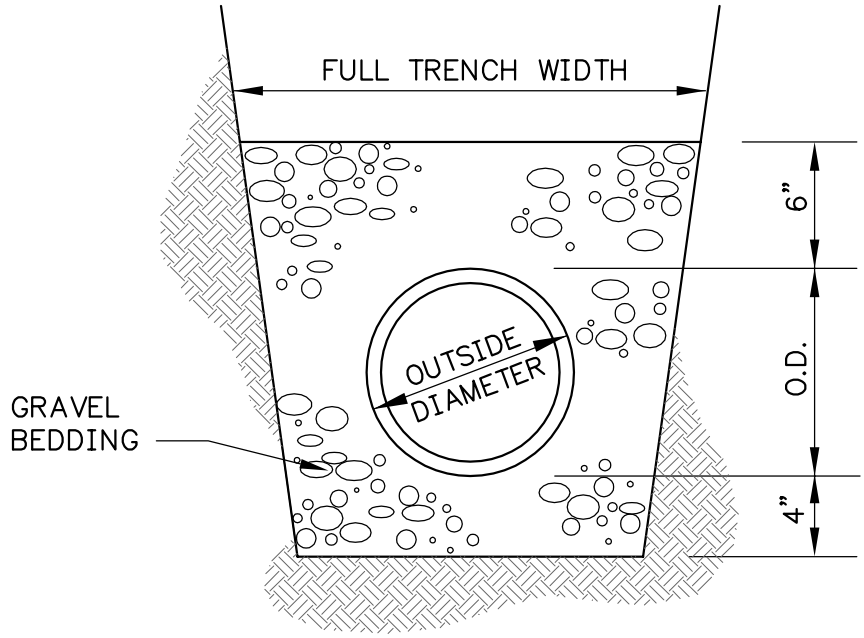
CLASS C
SHALLOW GRAVEL BEDDING

CLASS D
NATIVE BEDDING

NOTES:

1. EARTH TO BE COMPACTED IN MAXIMUM OF 6" LIFTS
2. "A"=4" FOR PIPE WITH OUTSIDE DIAMETERS 27" AND SMALLER
   "A"=6" FOR PIPE WITH OUTSIDE DIAMETERS 30' AND LARGER

22 RIGID PIPE BEDDING



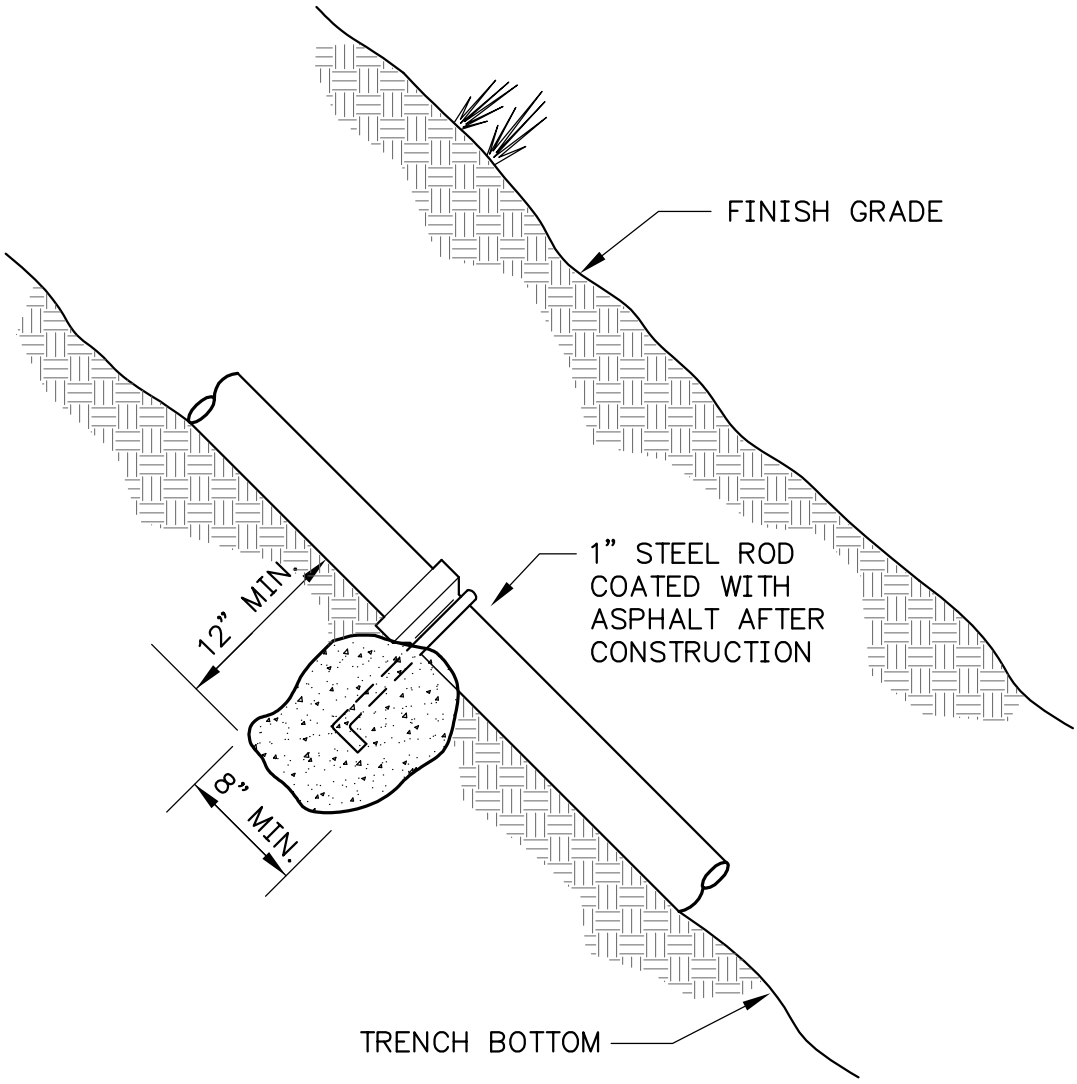
NOTES:

1. MATERIAL TO BE COMPACTED IN MAXIMUM OF 6" LIFTS

2. "A"=4" FOR PIPE WITH OUTSIDE DIAMETERS 27" AND SMALLER
   "A"=6" FOR PIPE WITH OUTSIDE DIAMETERS 30" AND LARGER

23

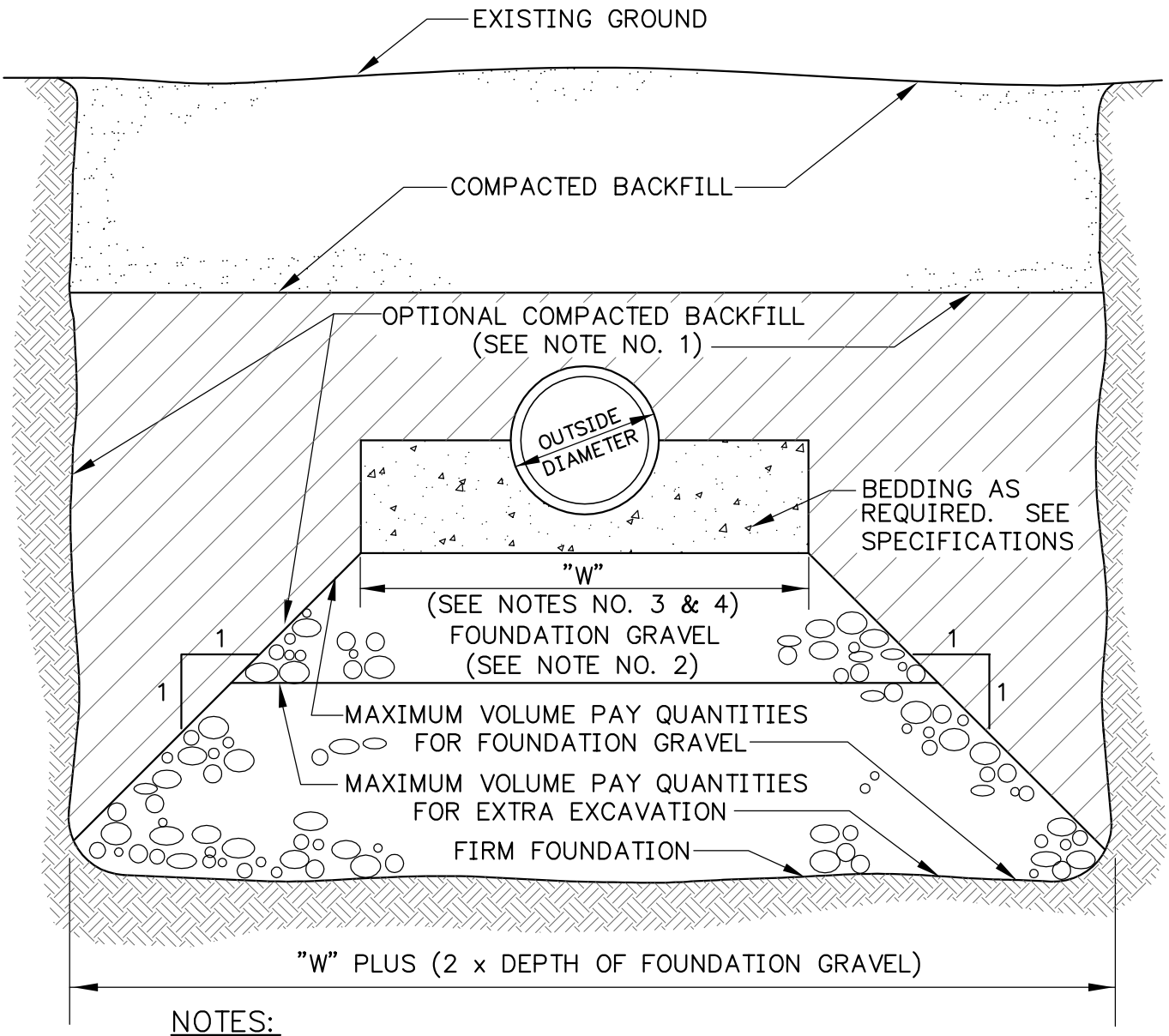
CLASS F FLEXIBLE PIPE BEDDING



NOTES:

1. MINIMUM ANCHOR WIDTH TO BE 1.5 TIMES PIPE DIAMETER, UNLESS OTHERWISE NOTED.
2. POUR BLOCKING AGAINST UNDISTURBED SOIL.
3. MINIMUM STRENGTH OF CONCRETE TO BE 2500 PSI.
4. MINIMUM SPACING BETWEEN ANCHORS TO BE 36' ON GRADES OF 20–30%, 20' ON GRADES OF 35–50%, AND 16' ON GRADES OVER 50%.

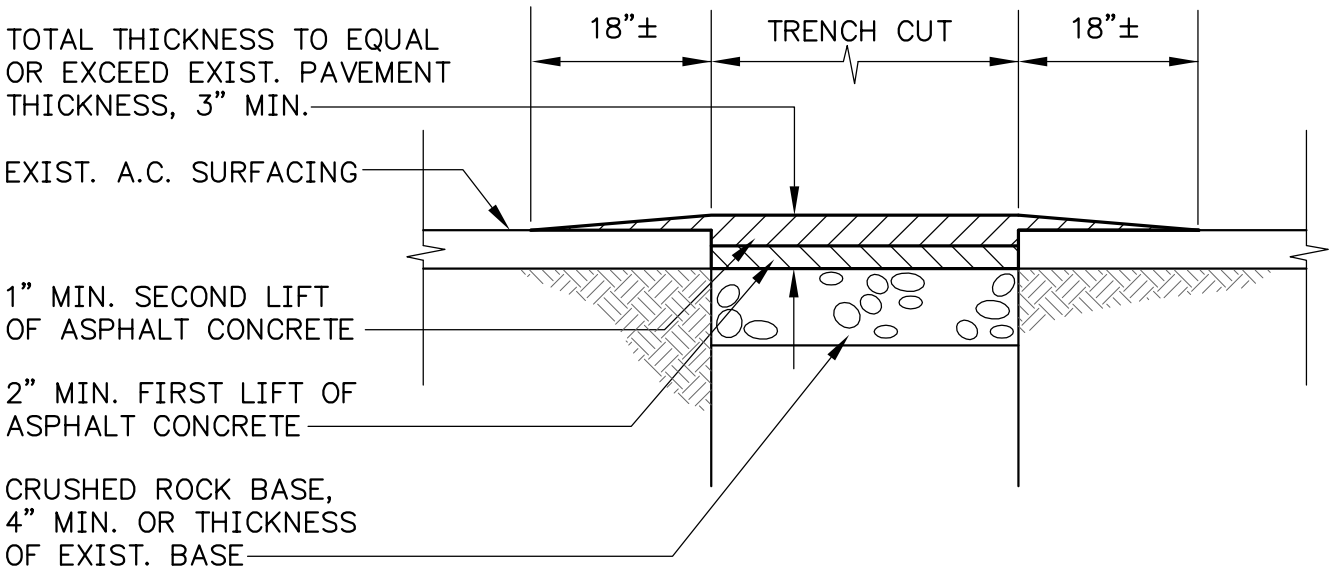
24 CONCRETE PIPE ANCHOR



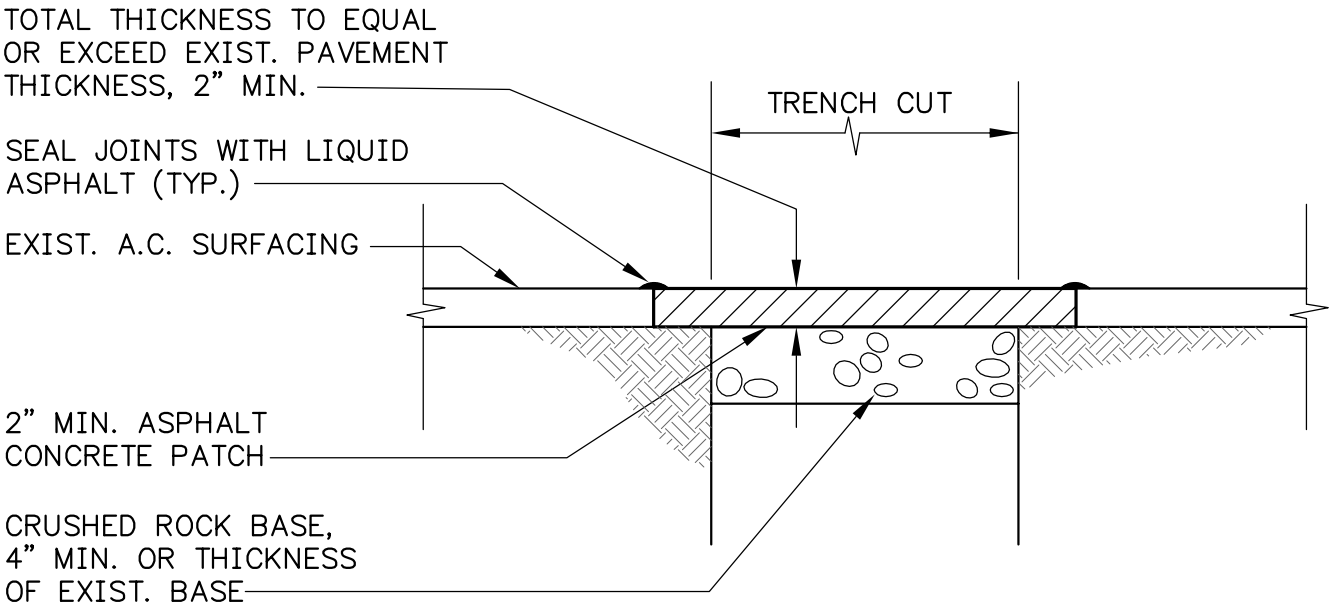
NOTES:

1. FOUNDATION GRAVEL OR GRAVEL BEDDING MAY BE SUBSTITUTED AT CONTRACTORS OPTION WITH NO ADDITIONAL COST TO THE OWNER.
2. REMOVE UNSUITABLE MATERIAL TO FIRM FOUNDATION AND REPLACE WITH FOUNDATION GRAVEL WHERE REQUIRED.
3. "W"=40" FOR RIGID PIPE 15" OR LESS IN DIAMETER, "W"=1.5 INTERNAL DIAMETERS PLUS 18" FOR RIGID PIPE 15" OR LARGER IN DIAMETER.
4. "W"=6 PIPE DIAMETERS FOR FLEXIBLE PIPE.
5. TICKETS NOT REQUIRED, QUANTITIES TO BE COMPUTED TO NEAT LINES SHOWN.

25 FOUNDATION GRAVEL AND BACKFILL



DOUBLE LIFT PATCH

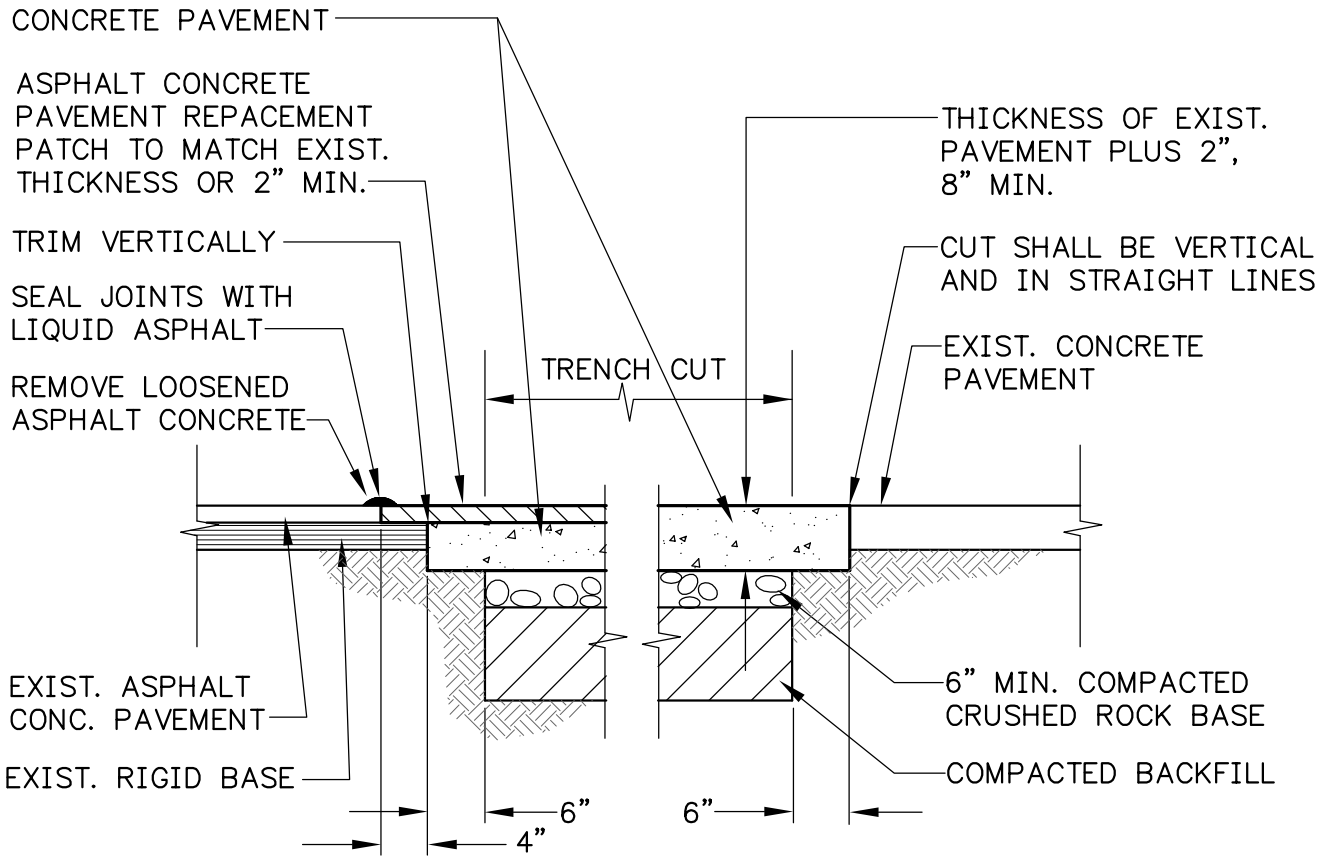


SINGLE LIFT PATCH

NOTES:

1. ASPHALT TREATED BASE MAY BE SUBSTITUTED FOR THE FIRST LIFT ASPHALT CONCRETE AND CRUSHED BASE. SEE SPECIFICATIONS.
2. ROAD AGENCY OR PLAN DETAILS OR REQUIREMENTS TAKE PRECEDENCE OVER THESE DETAILS.

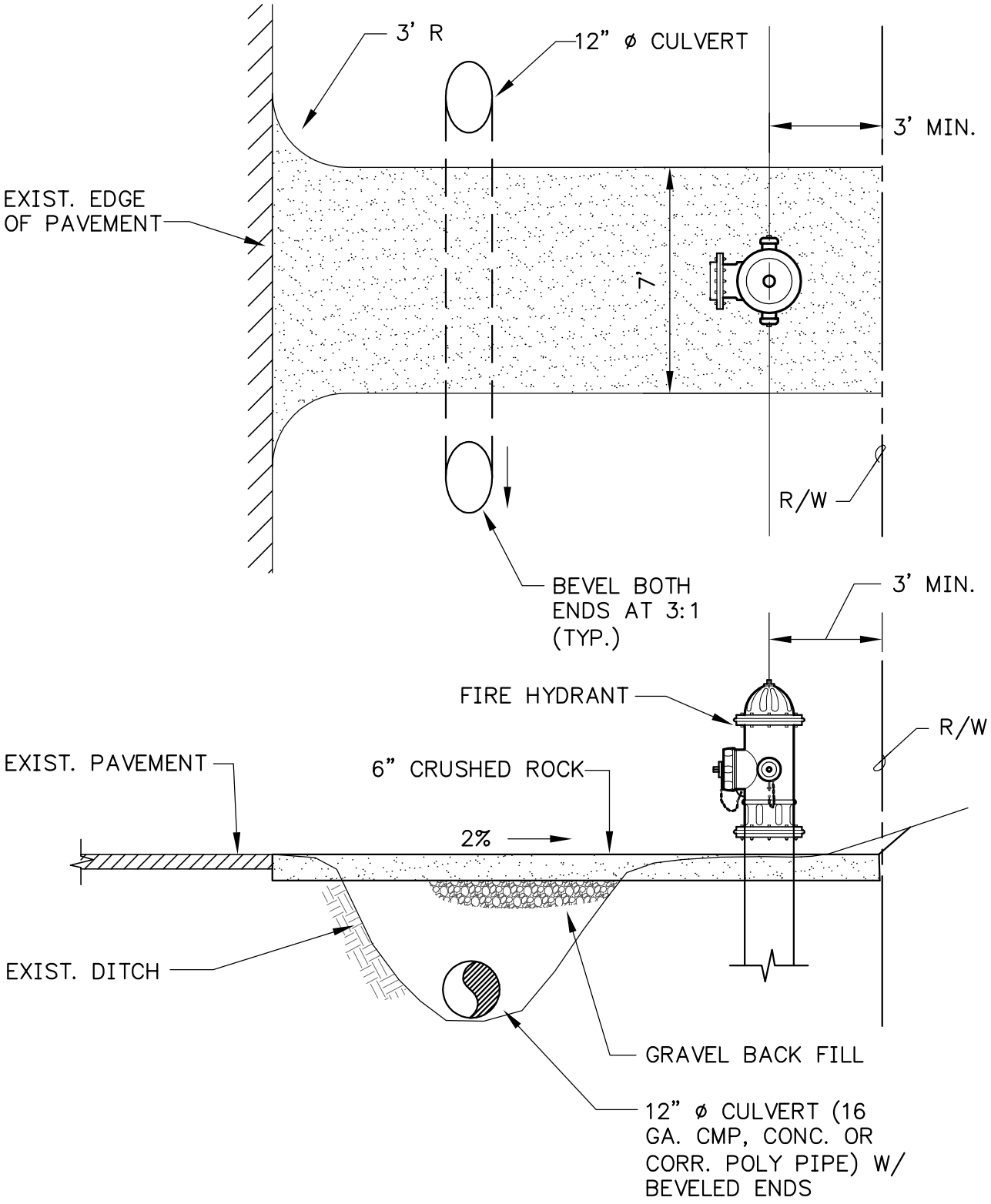
26 ASPHALT CONCRETE PATCHING



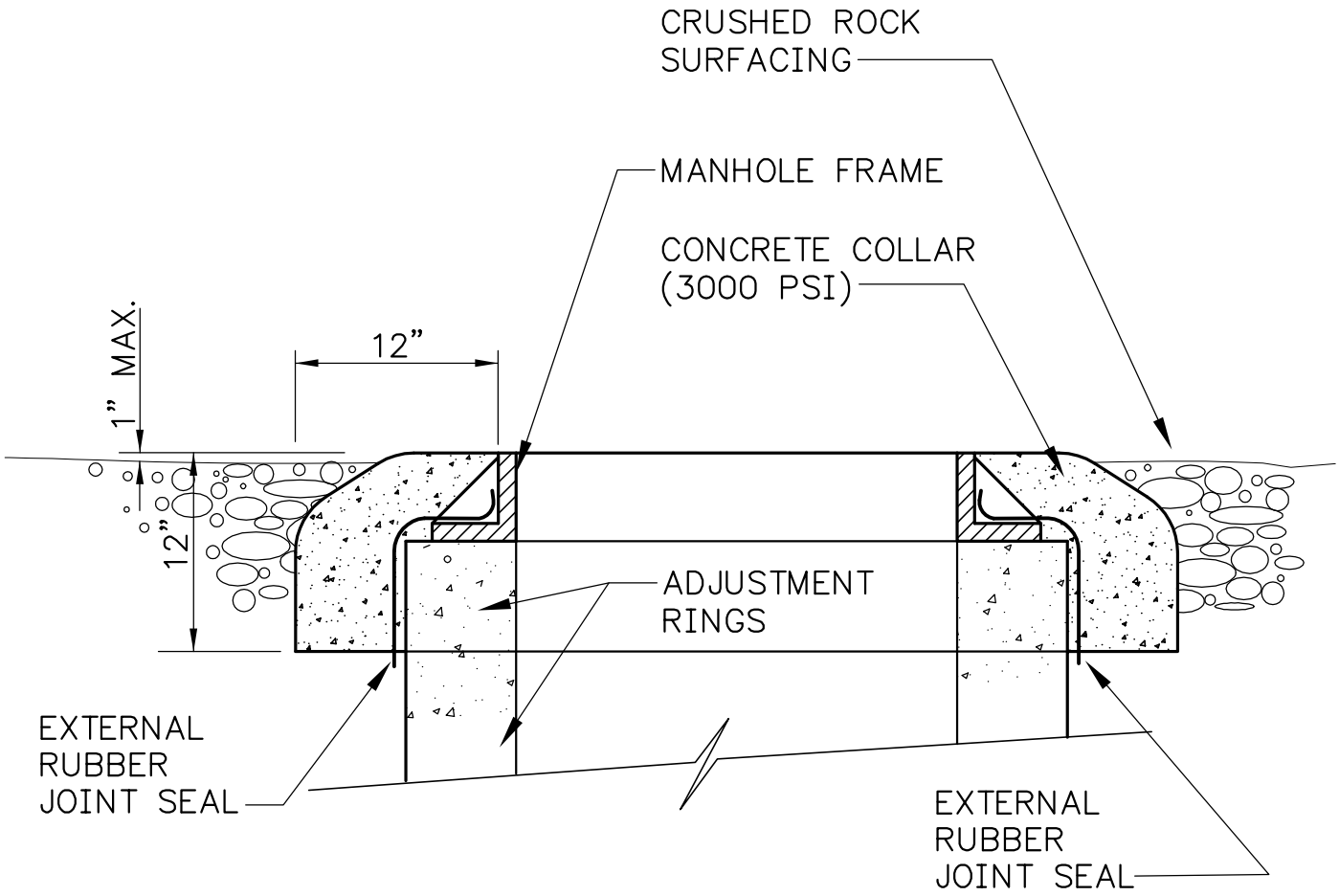
RIGID PAVEMENT WITH ASPHALTIC CONCRETE SURFACE

CEMENT CONCRETE PAVEMENT

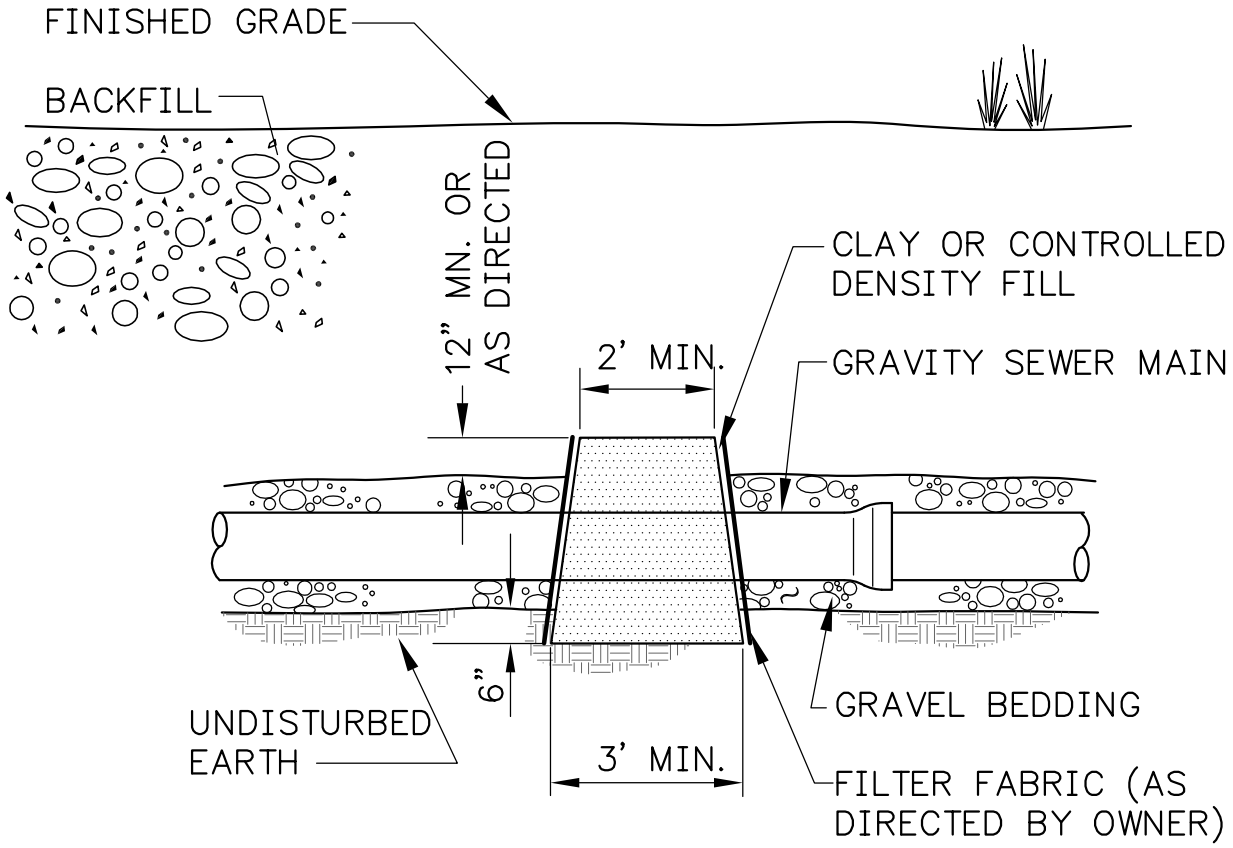
27 RIGID PAVEMENT PATCHING



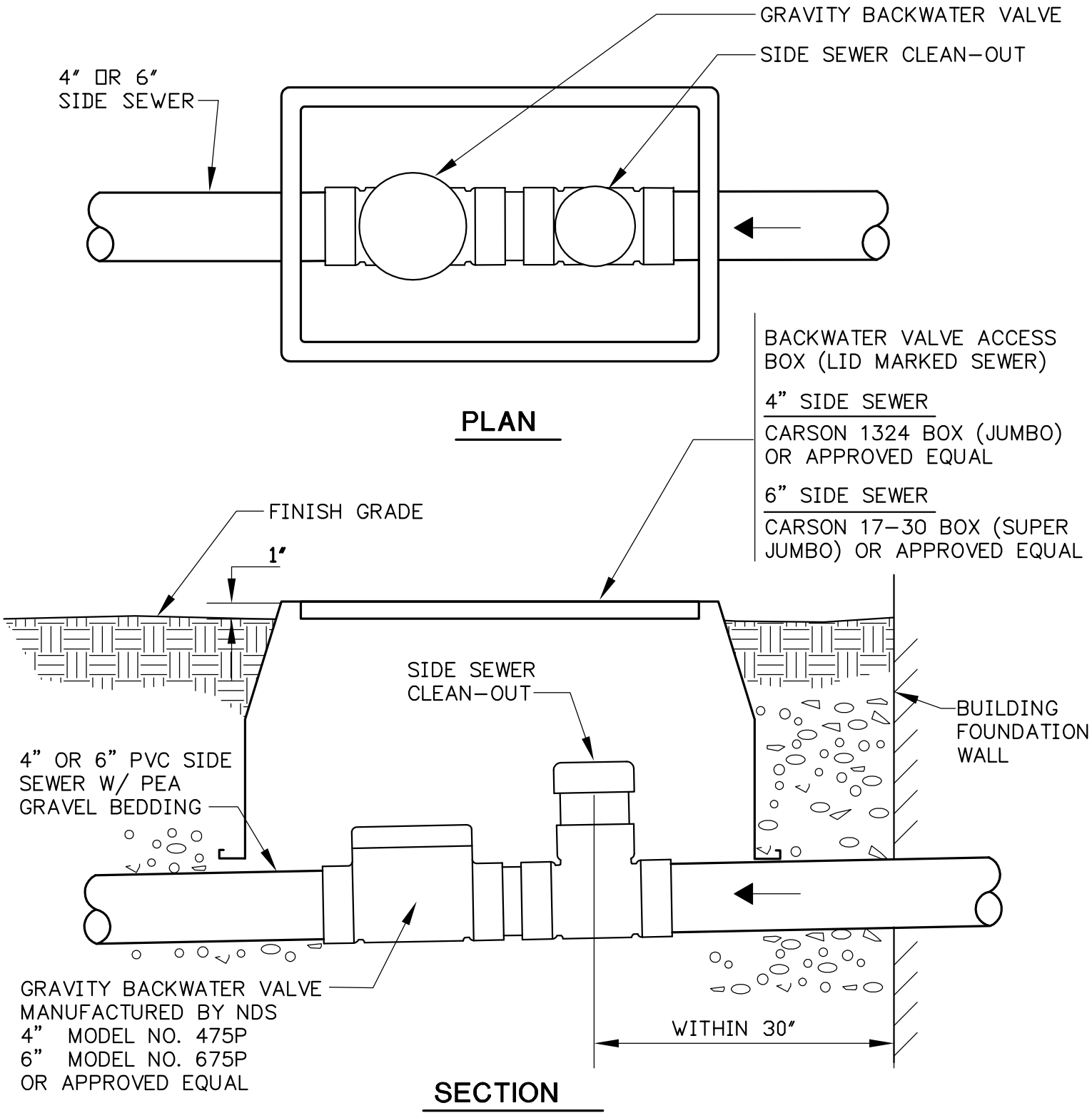
28 FIRE HYDRANT GRADED ACCESS



29 MANHOLE COLLAR



30 TRENCH DAM



NOTES:

1. INSTALLATION FOR 4" SIDE SEWER SHOWN.
2. THIS ASSEMBLY IS PART OF THE SIDE SEWER OWNED AND MAINTAINED BY THE PROPERTY OWNER AND IS SUBJECT TO ALL DISTRICT SIDE SEWER REGULATIONS.

31 GRAVITY BACKWATER VALVE

INDEX
DIVISION 1 - GENERAL CONSTRUCTION PROVISIONS

SECTION 01001
SPECIFICATION STRUCTURE

1. GENERAL

1.1 FORMAT

A. This specification is organized on the format promulgated by the Construction Specification Institute (CSI format).

B. This format assigns permanent numbers to all Divisions and Sections and so far as possible assigns permanent places to all products, processes, activities and construction requirements in the specifications. A number is assigned which will not change from specification to specification.

C. Division, Section and Subsection numbers which are not required are omitted from the Specification.

D. Reference to an Article is a numbered clause in the General Conditions.

1.2 INDEX

A. All Sections required for a complete Contract appear in the index. Sections that are not required are omitted.

B. Bidders and Contractors should check Sections present against the index to ensure the presence of all required Sections of the Contract.

1.3 ARRANGEMENT

A. The Project Manual is organized as follows:

1. Procedural and legal documents are in the opening Sections.
2. Specifications are in Divisions numbered 1 to 16.

B. No attempt has been made in these specifications or plans to segregate work covered by any trade or subcontractor under one specification. Such segregation and establishment of subcontract limits shall be solely a matter of specific agreement between the Contractor and his subcontractors and shall not be based upon an inclusion, segregation or arrangement in or of these specifications. The Contractor and subcontractor in each case is warned that work included in any subcontract may be divided between several general specifications and that each general specification or subhead of the Technical Specifications may include work covered by two or more subcontracts in excess of any one subcontract.

C. The Contractor shall be responsible for all work shown or specified, regardless of location in the Contract Documents.

1.4 LANGUAGE

A. These Specifications are written in imperative and abbreviated form.

B. This imperative language of the technical sections is directed at the Contractor, unless specifically noted otherwise.

C. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases.

D. Except as worded to the contrary, fulfill (perform) all indicated requirements whether stated imperatively or otherwise.

* * * END OF SECTION * * *

SECTION 01043
JOB SITE ADMINISTRATION

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Supervision: Section 12, General Conditions
B. Inspection Services: Section 01420
C. Temporary Water: Section 01515
D. Protection of Work and Property: Section 01545
E. Traffic Regulation: Section 01570

1.2 REMOVAL OF DEBRIS, CLEANING, ETC.

A. The Contractor shall at all times keep the construction area clean and orderly and upon completion of the work shall leave all buildings broom clean and all parts of the work clean and free of rubbish or excess material of any kind.
B. Windows, doors, hardware, woodwork, fixtures, equipment, walls and floors shall be left clean and free of stains, paint or roofing splashes or other mars or defects.
C. Upon completion, the site of all work or equipment and material storage areas shall be restored to substantially their original condition.
D. Miscellaneous debris, rocks, etc., resulting from the work shall be removed and disposed of in a manner satisfactory to the District.
E. The site shall be left in a clean and neat condition.

1.3 TESTS

A. Where the Specifications require work to be specifically tested or reviewed, it shall not be tested or covered up without timely notice to the Engineer of its readiness for inspection, unless the Engineer waives such notice.
B. Should any such work be covered up without such notice, approval or consent, it must, if required by the Engineer, be uncovered for examination at the Contractor's expense.
C. Where work is to be tested, all necessary equipment shall be set up and the work given a preliminary test so that any and all defects may be discovered and repaired prior to calling out the Engineer for the test.

1.4 DISTRICT MAY DETERMINE PRECEDENCE

A. Whenever, in his opinion, it is necessary to do so, in order to ensure proper completion of the Contract for construction and installation, the District shall determine the order of precedence and the time and season at which any portion or portions of the work shall be commenced and carried on.
B. The District may schedule a sequence of the work when it is in locations where the District is doing other work by his own forces, or by other contract, or when other work may be affected by work under this Contract, in order that conflict may be avoided and the work under these Specifications be coordinated with that under other contracts or with other work being done in connection with or growing out of operations of the District.
C. Nothing herein contained shall be taken to relieve the Contractor of any of his obligations or liabilities under this Contract.

1.5 COMMENCEMENT OF WORK ON PUBLIC AND PRIVATE RIGHT-OF-WAY

A. Work shall not be started on any public or private right-of-way until clearance is given the Contractor by the Engineer.
B. It will be the responsibility of the Contractor to comply with any special requirements of any permits or easements for the project acquired by the District.

* * * END OF SECTION * * *

SECTION 01045
CUTTING AND PATCHING

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Demolition: Section 02050

B. Pavement Repair and Resurfacing: Section 02575

1.2 METHODS

A. Execute cutting (including excavating), fitting or patching of work, required to:

1. Make several parts fit properly.
2. Remove and replace defective work.
3. Remove and replace work not conforming to requirements of Contract Documents.
4. Install specified work in existing construction.

B. Do not endanger any work by cutting or altering work or any part of it.

C. Do not cut or alter work of another contractor.

1.3 SUBMITTALS

A. Submit written notice to Engineer requesting consent to proceed prior to cutting which affects structural safety of project, or work of another contractor.

B. Submit notice to Engineer, designating time work will be uncovered, to provide for observation.

1.4 PAYMENT FOR COSTS

A. Contractor shall pay for all costs caused by ill-timed, unnecessary or defective work or work not conforming to Contract Documents, including costs for additional services of Engineer.

2. PRODUCTS

2.1 MATERIALS

A. For replacement of work removed, Contractor shall comply with Specifications for type of work to be done.

3. EXECUTION

3.1 INSPECTION

A. Inspect existing conditions of work, including elements subject to movement or damage during construction.

3.2 PREPARATION (PRIOR TO CUTTING)

A. Provide shoring, bracing and support as required to maintain structural integrity of all portions of the project.

3.3 PERFORMANCE

A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, and finishes.

B. Execute excavating and backfilling as specified in Section 02222.

C. Restore work which has been cut or removed.

* * * END OF SECTION * * *

SECTION 01070
ABBREVIATIONS AND SYMBOLS

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Definitions: General Conditions

1.2 ABBREVIATIONS

A. Whenever the following abbreviations are used on the plans, specifications, proposals and contracts, they shall be construed to mean the words and terms as listed below.

B. Duplicate definitions shall be interpreted in context of use.

A

AASHTO	American Association of State Highway and Transportation Officials
AC	Asbestos Cement or Asphaltic Concrete
ACI	American Concrete Institute
AFBMA	Anti Friction Bearing Manufacturers Association
AFF	Above Finish Floor
AGA	American Gas Association
AGC	Associated General Contractors of America
AGMA	American Gear Manufacturer Association
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANPT	American National Taper Pipe (pipe thread).
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASAE	American Society of Agriculture Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association

B

BTU	British thermal unit
BTUH	British thermal units per hour

C

C	Centigrade/Celsius
CB	Catch Basin
CBMA	Certified Ballast Manufacturers Association
CFM	Cubic feet per minute
CFS	Cubic feet per second
CL^2	Chlorine Solution
CMP	Corrugated Metal Pipe
CO	Clean Out
CPM	Critical path method

CRSI	Concrete Reinforcing Steel Institute
D	
D	Drain
dBA	Decibel Filter A
DFP	Douglas Fir Plywood Association
DFT	Dry Film Thickness
DI	Ductile Iron
DIPRA	Ductile Iron Pipe Research Association
DWV	Drain Waste Vent
E	
EA	Each
EEO	Equal Employment Opportunity
E/P	Edge of Pavement
EPA	Environmental Protection Agency (Federal)
F	
F	Fahrenheit
FCA	Flanged Coupling Adapter
FED SPEC	Federal Specification
FHWA	Federal Highway Administration
FL	Flanged
FPM	Feet per minute
FRP	Fiberglass Reinforced Plastic
FT, FT^2, FT^3	Foot, square feet, cubic feet
G	
GA	Gage, gauge
GAL	Gallon
GALV	Galvanized
GCE	Grit Chamber Effluent
GPD	Gallons per day
GPH	Gallons per hour
GPM	Gallons per minute
H	
HB	Hose Bib
HDPE	High Density Polyethylene
HOA	Hand-Off-Auto
HP	Horsepower or High Point
HR	Hour
HT	Height
Hz	Hertz
I	
ID	Inside Diameter
IE	Invert Elevation
IEEE	Institute of Electrical and Electronics Engineers
IN, IN^2, IN^3	Inch, square inches, cubic inches
IPCEA	Insulated Power Cable Engineers Association
IPS	Iron Pipe Size
ISA	Instrument Society of America
J	
JIC	Joint Industry Conference of Hydraulic Manufacturers
K	
KV	Kilovolt

KVA	Kilovolt ampere
KVAR	Reactive kilovolt amperes
KW	Kilowatts
KWH	Kilowatt hours
L	
L	Length
LB	Pounds
LF	Linear feet
LS	Lump Sum
M	
M	Thousand
MA	Milliamperes
MBTUH	One thousand British thermal units per hour
MGD	Million gallons per day
mgl	Milligrams per liter
MIN	Minute
MJ	Mechanical Joint
ML	Mixed Liquor
MSDS	Material Safety Data Sheets
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
MV	Millivolts
MVA	Megavolt amperes
N	
NAAPI	North American Association of Pipeline Inspectors
NAMM	National Association of Metal Manufacturers
NBFU	National Bureau of Fire Underwriters
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
NPC	National Plumbing Code
NPT	National pipe thread
NRS	Non-rising stem
NLMA	National Lumber Manufacturers Association
O	
o.c.	On Center
OD	Outside diameter
OECI	Overhead Electric Crane Institute
OSHA	Occupational Safety and Health Act
OZ	Ounce
P	
PACP	Pipe Assessment Certification Program
PCA	Portland Cement Association
PCF	Parts per Cubic Foot
PD	Pitch Diameter
pH	Hydrogen ion concentration
PH	Phase
PPM	Parts per million
PSF	Pounds per square foot
PSI	Pounds per square inch
PSIG	Pounds per square inch gauge

PT	Pint
PVC	Polyvinyl chloride
Q	
R	
RAS	Return Activated Sludge
RCW	Revised Code of Washington
RPM	Revolutions per minute
S	
S	Slip
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Manufacturers Association
Sc	Scum
SCFM	Standard cubic feet per minute
SE	Secondary Effluent
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SP	Static Pressure
SPDT	Single Pole Double Throw
SQFT	Square foot
SQIN	Square inch
SQMI	Square mile
SSPC	Steel Structures Painting Council
SW	Service Water (Effluent)
T	
TEFC	Totally Enclosed, Fan Cooled
THD	Threaded
TOW	Top of Wall
U	
UBC	Uniform Building Code
UHMW	Ultra-High Molecular Weight
UL	Underwriter's Laboratory
UPC	Uniform Plumbing Code
USEPA	United States Environmental Protection Agency
V	
V	Volt
VOC	Volatile Organic Compound
W	
W	Plant Water
WAC	Washington Administrative Code
WAS	Waste Activated Sludge
WCLIB	West Coast Lumber Inspection Bureau
WOG	Water, Oil, Gas
WWF	Welded Wire Fabric
WWPA	Western Wood Products Association
X	
Y	
Z	

* * * END OF SECTION * * *

SECTION 01090
REFERENCE STANDARDS

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. All Divisions: As referenced

1.2 AUTHORITY

A. Contractor is responsible to conform to all codes and regulations legally in effect at the location of the project.

B. Contractor shall conform to all requirements and regulations of the authority administering such codes and regulations.

1.3 REFERENCE CODES

A. Contractor shall conform to all codes and sections thereof as may be referred to in the specifications.

B. Referenced codes are, by such reference, incorporated into this Contract as if set forth herein in full.

1.4 SPECIFICATIONS INCORPORATED BY REFERENCE

A. Where Federal, AWWA, ASTM, WSDOT or any other technical standard specifications are referred to, or included by reference, the latest issue and/or amendment thereto published at the date of issue of the Advertisement for Bids shall be incorporated in the Contract by said reference as if set forth herein in full.

* * * END OF SECTION * * *

SECTION 01210
PRECONSTRUCTION CONFERENCES

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Job Site Administration: Section 01043
B. Shop Drawings, Project Data and Samples: Section 01340
C. Traffic Regulation: Section 01570
D. Material and Equipment: Section 01600

1.2 SCHEDULE

A. Not more than five days after notice to proceed but earlier if practicable, the District will schedule a preconstruction meeting.
B. Present at the meeting to represent the Contractor shall be at least the official in charge of the project, the project superintendent, a representative with authority to speak for each of his principle subcontractors, and other representatives as he may deem expedient.
C. The District and/or his representatives shall be present as required.
D. Proceedings of meeting to be recorded and distributed to interested parties.

1.3 AGENDA

A. Both District and Contractor shall be prepared to speak to the following:
   1. Name and field address of job superintendent.
   2. Emergency phone and/or operator.
   3. Date of Construction Start.
   4. Date of Notice to Proceed.
   5. Notification of utilities concerned, fire, police, schools, etc.
   6. Coordination with other contractors.
   7. Permits: county, city, state fisheries, government agencies as required.
   8. Inspector: name, authority.
   9. Field office (location).
   10. Shop Drawing Submittals.
   11. Responsibility for lines and grades.
   12. Minimum wage rates and posting of wage rate determination.
   13. Equal employment opportunities and posting of EEO poster. Use of local labor.
   14. Weekly payrolls when required.
   15. Schedule of Values.
   16. Periodic monthly payments including date for submittal.
   17. Construction progress schedule (bar graph or C.P.M.).
   18. Safety Requirements and special hazards.
   19. Insurance and Bonds.
   20. Traffic control.
   21. Construction signs.
   22. Drawings revised to conform to construction records.
   23. Beneficial occupancy.
   24. Retention of Contract records.
   25. Guarantees and warranties.
   26. Operation and Maintenance Manuals.
   27. Nondiscrimination Notice.
   28. Project signs.
   29. Testing.
   30. Progress meetings.
   31. Complaint procedure.
   32. Job photos.

33. Other matters concerning construction.

* * * END OF SECTION * * *

SECTION 01340
SHOP DRAWINGS, PROJECT DATA AND SAMPLES

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Job Site Administration: Section 01043
B. Testing Laboratory Services: Section 01410
C. Project Record Documents: Section 01720

1.2 SCHEDULE

A. Prepare and submit with Construction Schedule a separate schedule listing dates for submission and dates that reviewed shop drawings, project data and samples will be needed.
B. Fabrication of an item or construction work shall not start before the Engineer has taken action on the shop drawing submittal. Any work shall be entirely at the Contractor's risk.
C. The Engineer will not accept for payment work performed by the Contractor which may be affected by materials, equipment, or methods of work not submitted in a timely manner so that final review can be accomplished before the affected work is complete.
D. Incomplete shop drawings or submittal rejected by the Engineer shall not be basis for claim for delay.

1.3 SUBMITTALS

A. Shop Drawings, data and samples shall be submitted attached to a form furnished by the Engineer entitled "Shop Drawing Transmittal". Location by drawing number and paragraph of specification shall be shown on the form for the product or material being submitted. Each transmittal shall be assigned a unique number in sequential order.
B. Shop drawings shall be submitted and reviewed in the following manner:
    1. The Contractor shall review, stamp with his approval and submit postpaid with such promptness as to cause no delay in his work or in that of any other contractor, the required number of copies of all shop drawings, schedules, data, and samples required for the work of the various trades determined necessary by the Engineer, required in the General Conditions and/or described elsewhere in the Project Manual.
    2. Shop drawings shall establish the actual detail of all manufactured or fabricated items. All shall be drawn to scale and be completely dimensioned.
    3. Sheet sizes of shop drawings shall be in multiples of 8-1/2 by 11 inches and not exceeding 22 by 34 inches unless there is a special requirement for larger size sheets.
    4. Provide on each drawing a clear space for the Engineer's and/or District's review and approval stamps and comments.
    5. Four (4) copies of shop drawings, manufacturer's literature, brochures, catalog cuts, and other pertinent printed matter or data shall be submitted in addition to the number of copies the Contractor wishes returned to him.
    6. Shop drawings may be submitted to the Engineer in the form of a reproducible transparency, along with one blackline or blueline print.
    7. The Engineer shall review the shop drawings with reasonable promptness and will affix the Shop Drawing Review Stamp with notations thereon indicating "No Exceptions Taken", "Make Corrections Noted", "Revise and Resubmit", or "Rejected -- See Remarks". He will then obtain the prints he requires from the transparency and forward it along with one marked up copy and the reviewed copies of the other material in excess of four to the Contractor.

8. When shop drawings and/or other submittals are required to be revised or corrected and resubmitted, the Contractor shall make such revisions and/or corrections and resubmit the drawings or other material in the same manner as specified above.
9. Contractor shall obtain and provide such number of prints or copies of drawings as is required for his field distribution.
10. It shall be the Contractor's responsibility to clearly note on the shop drawings, and in writing specifically call to the Engineer's attention, any changes that vary from the Contract Drawings and Specifications. No review of the shop drawings by the Engineer shall relieve the Contractor of full responsibility and at his own cost and expense to comply with the Contract Documents unless the changes are clearly noted and in writing called to the Engineer's attention as above provided, in which event subsequent acceptance by the Engineer in writing shall be authority for the change or changes proposed in the shop drawings.
11. If corrections are required, the Contractor shall make the corrections required by the Engineer and file with him the same number of corrected copies as indicated above. The Contractor shall direct specific attention in writing or, on resubmitted Shop Drawings to revisions other than the corrections requested on previous submissions. The Engineer will return to the Contractor copies of drawings in the same manner and number as before.
12. Shop Drawings shall give complete information necessary for the fabrication and installation of all component parts of the equipment, structure, facility, etc. In the case of structural drawings, they shall include the location, type, size and extent of all welds, if any are necessary. Manufacturer's standard details, catalogues, advertising literature, etc., shall not necessarily constitute all of the shop drawings required for any unit or facility. Additional shop details designed for the particular project shall be furnished when required by the Engineer. Shop drawings of electrical equipment shall include complete diagrams of electrical circuitry.
13. The Engineer's review of and placement of shop drawing review stamp on any shop drawing is understood to be an acceptance of the character of the details and not a check of any dimension or quantity and will not relieve the Contractor from responsibility for errors of any sort in shop drawings data or schedules, whether or not such errors are found by the Engineer in his review of such details.
14. The Engineer's review of and placement of Shop Drawing Review Stamp on any shop drawing will not relieve the Contractor of responsibility for consequences due to deviations from the Contract Documents unless the Contractor has called attention to such deviations in writing by a letter accompanying the drawings at the time of submission and the Engineer accepts such deviations in writing.
15. No changes will be made in any drawing after it has been reviewed except by the consent or direction of the Engineer in writing.

C. Samples shall be submitted in the same manner as shop drawings.
   1. Samples to be physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.
      a. Office samples of sufficient size and quantity to clearly illustrate:
         i. Functional characteristics of product or material, with integrally related parts and attachment devices.
         ii. Full range of color samples.

iii. After review the Engineer will retain two samples and return the remainder to the Contractor.

b. Field samples and mockups
   i. Erect at project site location acceptable to Engineer
   ii. Construct each required sample or mock-up complete, including work of all trades required in finished work.
   iii. Coordinate sampling of natural materials with Field Engineer.

2. If any test sample fails to meet the specification requirements, all previous approvals will be withdrawn and such materials or equipment, which fail the testing, shall be subject to removal and replacement by the Contractor with materials or equipment meeting the specification requirements.
3. Affected finish work shall not be commenced until the Engineer has given written approval for the field samples.

1.4 CONTRACTOR RESPONSIBILITY

A. Contractor shall review and approve shop drawings before submittal. Submittal directly from supplier or subcontractor will not be accepted.
B. By approving and submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawing with the requirements of the Work and of the Contract Documents and that there is no conflict with other submittals that may affect the work of another contractor or the District.
C. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the job site and shall be available to the Engineer.

1.5 LIMITATION

A. Two submittals of each item requiring samples and/or shop drawings will be reviewed by the Engineer in the regular course of the Contract. However, all subsequent reviews of the same item over two will be reviewed at the expense of the Contractor unless the right to an additional review without charge was previously approved in writing by the Engineer. Contractor will be billed by the District at the Engineer's current established rates.

* * * END OF SECTION * * *

SECTION 01410
TESTING LABORATORY SERVICES

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420

B. Testing Requirements: Various Sections

1.2 BIOLOGICAL TESTING

A. Biological tests required for disinfection of domestic water systems shall be by a laboratory approved by the Health Department or other authority having jurisdiction.

1.3 CONTRACTOR WILL PAY FOR SERVICES OF AN INDEPENDENT TESTING LABORATORY FOR:

A. Soils gradation, moisture density standards determination, and in place density tests per Division 2.

B. Other materials and/or workmanship specified in Division 2.

1.4 LIMITATION

A. Employment of a testing laboratory shall in no way relieve the Contractor of his obligation to perform work in accordance with the Contract.

1.5 QUALIFICATION OF LABORATORY

A. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".

B. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.

C. Testing Equipment:

1. Calibrated at maximum 12 month intervals by devices of accuracy traceable to National Bureau of Standards.
2. Submit copy of certificate of calibration, made by accredited calibration agency.

1.6 LABORATORY DUTIES, AUTHORITY AND LIMITATION

A. Cooperate with Engineer and Contractor.

B. Provide qualified personnel promptly on notice.

C. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specified standards; ASTM, other recognized authorities, and as specified.
2. Ascertain compliance with requirements of Contract Documents.

D. Promptly notify Engineer, and Contractor, of irregularities or deficiencies of work which are observed during performance of services.

E. Promptly submit 2 copies of report of inspections and tests to Engineer, in addition to those required by the Contractor including:

1. Date issued
2. Project title and number
3. Testing Laboratory name and address
4. Name and signature of Inspector
5. Date of inspection of sampling
6. Record of temperature and weather
7. Date of test
8. Identification of product and specification section
9. Location in project
10. Type of inspection or test
11. Results of test

12. Observations regarding compliance with Contract Documents

F. Perform additional services as required.

G. Laboratory is not authorized to:
   1. Release, revoke, alter, or enlarge on, requirements of Contract Documents.
   2. Approve or accept any portion of work.

1.7 RESPONSIBILITIES OF CONTRACTOR

A. Cooperate with laboratory personnel and provide access to work.

B. Provide to laboratory, preliminary representative samples of materials to be tested in required quantities.

C. Furnish copies of mill test reports.

D. Furnish casual labor and facilities:
   1. To provide access to work to be tested.
   2. To assist laboratory personnel to obtain and handle samples at the site.
   3. To facilitate inspections and tests.
   4. For laboratory's exclusive use for storage and curing of test samples.

E. Notify laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

F. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory or agency, the sample or samples of materials to be tested shall be selected by such laboratory or agency, or the Engineer, and shipped to the laboratory by the Contractor at his expense.

* * * END OF SECTION * * *

SECTION 01420
INSPECTION SERVICES

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Status of Engineer: Section 7 General Conditions
B. Rejected Work/Re-inspection: Section 14 General Conditions
C. Re-inspection: Section 14 General Conditions
D. Utilization of Defective Work: Section 14 General Conditions
E. Job Site Administration: Section 01043
F. Testing Laboratory Services: Section 01410

1.2 AUTHORITY AND DUTIES OF INSPECTORS

A. Inspectors are placed on the work to keep the Project Engineer informed as to the progress of the work and the manner in which it is being done; to keep records; act as liaison between the Contractor and the Project Engineer; also to call the attention of the Contractor to any deviations from the Contract Documents, but failure of the Inspector to call to the attention of the Contractor to faulty work or deviations from the Contract Documents shall not constitute acceptance of said work.
B. The Inspector may reject or accept materials and equipment to be incorporated in the work and such specific items as he is authorized by the Engineer to accept.
C. When any material has been accepted by the Inspector, it passes from his control to the control of the Contractor and remains there until the job, as a whole, is complete. Since the Inspector cannot control how the material is used, the responsibility for its safety and proper use will be the Contractor's. Until the job is finally completed, the Contractor might do work that changes or modifies work previously done and even though at any given time a piece of work might be well done and acceptable in quality, the responsibility for keeping it in that condition until the job is completed is the sole responsibility of the Contractor. For this reason, it is impossible to accept, finally, any portion of a project until the project as a whole is acceptable and control of said project is withdrawn from the Contractor by final official written acceptance by the District.
D. Since one of the Inspector's primary interests is to see that work on the project progresses expediently and in a workmanlike manner, he may at various times offer suggestions to the Contractor which the Contractor may or may not follow, at his discretion. Such suggestions are never to be considered as anything but suggestions and involve no assumption of responsibility, financial or otherwise, by either the Inspector himself, the Engineer, or the District.
E. Any personal assistance which an Inspector may give the Contractor will not be construed as the basis of any assumption of responsibility in any manner, financial or otherwise, by the Inspector, the Engineer, or the District.
F. The Engineer is not and does not purport to be a Safety Engineer and is not engaged in that capacity by the District and shall have neither authority nor responsibility to enforce construction safety laws, rules, regulations, procedures or the safety of persons on and about the construction site.
G. The presence or absence of an Inspector on any job will be at the sole discretion of the Engineer, and such presence, or absence, of an Inspector will not relieve the Contractor of his responsibility to obtain the construction results specified in the Contract Documents.
H. The Inspector will not be authorized to approve or accept any portion of the work, to make changes in the work, or to issue instructions contrary to the Contract Documents, such approvals, acceptances, or instructions, when given, must be in writing

and signed by the Project Engineer. The Inspector will have authority to reject defective material; however, the failure of the Inspector to reject defective material or any other work involving deviations from the Contract Documents will not constitute acceptance of such work.

I. Nothing in this subsection shall in any way be so construed as to require or to place responsibility for, the method, manner or supervision of the performance of the work under this Contract upon the Inspector, the Engineer, or the District. Such responsibility rests solely with the Contractor.

1.3 EXAMINATION OF MATERIALS

A. The neglect or failure on the part of the Engineer to condemn or reject substandard material or work shall not imply an acceptance of the materials or work. The Contractor shall furnish, at his own expense, such labor as may be required to enable the Engineer to make a thorough inspection and culling of the materials, and the Contractor shall bear the costs of all laboratory or other testing called for in these Specifications.

B. Where required by the Specifications, the Engineer will examine certain materials such as masonry materials, concrete, aggregates, etc., at the manufacturer's plant prior to their delivery to the job site. The Contractor shall bear the cost of such material inspection including the Inspector's time, travel time and transportation expense and any other costs incurred, or chargeable to, or by, such material inspection. These inspection costs shall be billed to the Contractor at the Engineer's current billing rate. Transportation expense shall be billed at current rate. All such material inspection charges will be billed directly to the Contractor by the District and said costs shall be a lien against the Contractor's work. If the Contractor fails to pay said bill, or bills, by the 30th day of the month billed, such payment may be withheld from monies due the Contractor.

* * * END OF SECTION * * *

SECTION 01515
TEMPORARY WATER

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Water Lines: Section 02660

1.2 DESCRIPTION OF SYSTEM

A. The Contractor shall make arrangements for and provide all necessary facilities for water supply at his own expense, unless otherwise provided.

1.3 COSTS

A. Pay costs of temporary water services, including costs of installations, maintenance and removal of facilities.

B. The District is a water purveyor. All water usage (from the District's water system) by the Contractor will be metered, whether for pipeline filling, testing and flushing or for other construction activities. Water for initial filling, testing and one flushing of the new pipelines will be available from the existing water distribution system at no cost to the Contractor after obtaining prior permission from the District.

C. The Contractor will be charged for any additional water required for testing and flushing beyond the initial amounts supplied in Item B. The Contractor will be charged for all water used for other construction activities.

2. PRODUCTS

2.1 MATERIALS

A. Materials may be new or used but must be adequate for purpose required, sanitary and must not violate requirements of applicable codes.

3. EXECUTION

3.1 GENERAL REQUIREMENTS

A. The water utility shall be contacted to determine if sufficient water is available at the particular time before any use.

B. Flushing overnight or excessive wasting will not be permitted.

C. The Contractor shall use only those hydrants designated by the agency in charge of water distribution and in strict accordance with its requirements for hydrant use.

D. The Contractor shall use hydrant wrenches only in open hydrants. He shall also make certain that the hydrant valve is open "full", since "cracking" the valve causes damage in the valve. An approved auxiliary valve shall be provided on the outlet line for control purposes. Fire hydrant valves must be closed slowly to avoid a surge in the system which creates undue pressure on the water lines. The Contractor shall carefully note the importance of following these directions.

E. If one of the Contractor's employees shall knowingly or unknowingly use the wrong wrench on a hydrant and thereby damage the hydrant valve stem, the Contractor will be responsible. He shall immediately notify the water utility so that the damage can be repaired as quickly as possible.

F. Upon completing the use of the hydrants, the Contractor shall notify the water distribution agency, so that the hydrants may then be inspected for possible damage. Any damage resulting from the use of the hydrants by the Contractor will be repaired by the water agency and the cost thereof shall, if necessary, be withheld from the final payment to the Contractor.

G. The Contractor shall furnish all connectors, wrenches, valves, and small tools that may be necessary to meet the requirements of the water distribution agency pertaining to hydrant use.

H. Violation of these requirements will result in fines and will lay the Contractor liable for damage suits because of malfunctioning of damaged fire hydrants, in the event of fire or other emergencies.

3.2 REMOVAL

A. Completely remove temporary materials and equipment upon completion of construction.

* * * END OF SECTION * * *

SECTION 01545
PROTECTION OF WORK AND PROPERTY

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Protection of Work, Property and Persons: Section 11 General Conditions
B. Lands and Right-of-Way: Section 21 General Conditions
C. Access and Haul Roads: Section 01550
D. Temporary Controls: Section 01560
E. Pavement Repair and Resurfacing: Section 02575
F. Existing Utilities/Facilities - Underground and Overhead: Section 02760
G. Landscape Restoration: Section 02990

1.2 PUBLIC AND PRIVATE PROPERTY

A. The Contractor shall protect and maintain all underground or above-ground utilities and structures affected by the work and all lawns, shrubs, trees, fences, rockeries, etc., and parking strips or private property crossed by or adjacent to his operation, and any damage shall be repaired and restored by the Contractor to the satisfaction of the District.
B. The Contractor will be responsible for all damage to roads, highways, ditches, bulkheads, walls, bridges, culverts, utilities, barricades, lights, or other property, caused by the work, whether such damage be at the site of the work or caused by transporting or hauling to or from the work; and he shall repair or replace, or arrange for the repair or replacement of all such damage to the satisfaction of the District. Any material damaged by the Contractor's operations shall be replaced with new material.
C. Whenever construction work under this Contract is undertaken on easement, right-of-way, or franchise, all work shall be confined to the limits of such easement, right-of-way, or franchise, and accomplished so as to cause the least amount of disturbance and a minimum amount of damage.
D. Completion of work across private property shall be carried out in one continuous operation of construction of the facilities with the immediate restoration and cleanup of the construction area. If the Contractor fails to perform such construction and restoration continuously as herein provided, the District may give the Contractor a written notice to so perform, and in event of failure by the Contractor to complete such construction and restoration within 72 hours of such notice, the District may complete the installation and restoration on such private property to the extent the District deems advisable and the cost of all work, labor, materials, and expenses incurred by the District in so doing shall be paid by the Contractor and may be deducted from any monies due or to become due, the Contractor.
E. Particular care shall be exercised to see that the topsoil from the trench is preserved and replaced in its original location. It shall be the Contractor's responsibility to strip such topsoil from the trench, or construction area, and stockpile it in such a manner that it may be replaced, by him, upon completion of construction.
F. Wherever it may be necessary for the Contractor to trench through any lawn areas, the sod shall be carefully cut and rolled and replaced after ditches have properly compacted. All work shall be done in a manner calculated to leave the lawn area clean of earth and debris and in a condition as near as possible to that which existed before work was started.
G. The Contractor shall not remove, even temporarily, any trees or shrubs which exist on easements across private property or in parking strips, without first having notified the property owners or authorities maintaining same.
H. Ornamental trees and shrubbery shall be carefully removed with the earth

surrounding their roots, wrapped in burlap and replanted in their original positions within 48 hours. Ornamental trees or shrubbery destroyed, or damaged, by the Contractor, whether on public or private property shall be replaced by the Contractor with material of equal quality, and no additional compensation will be allowed for such replacement.

I. It is expressly understood that the Contractor shall in particular restore all such easements and right-of-way to a condition equal to its original condition and in a condition satisfactory to the property owners and the District. It is also understood that any private improvements made in public right-of-way are included in the above category.

J. All property owners affected by work including upstream, downstream, or adjacent connections, shall be notified before starting work.

1.3 TREES

A. All existing trees and shrubs which are to be protected and are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company under permit from the jurisdictional agency or owner and to the satisfaction of said agency and/or owner.

B. The Contractor shall immediately notify the Engineer and/or owner if any tree which is to be protected is damaged by his operations. If, in the opinion of said agency or the owner, the damage is such that replacement is necessary, the Contractor shall replace the tree at his own expense.

C. Replacement trees shall be of a like size and variety as the tree damaged, or, if of a smaller size, the Contractor shall pay to the owner of said tree a compensatory payment acceptable to the tree owner not to exceed the cost of replacing the tree as determined from quotes obtained by the tree owner from a minimum of two local nurseries. The size of the replacement trees shall be not less than 1-inch diameter nor less than 6 feet in height.

D. When trimming is permitted, symmetry of the tree shall be preserved. No stubs or splits or torn branches shall be left. Clean cuts shall be made close to trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material.

1.4 EASEMENTS

A. Reference numbers of easements are shown on drawings.

B. The Contractor shall meet and fulfill all covenants and stipulations of each easement obtained by the District for this project.

C. Copies of all easements and special covenants are on file in the office of the District, which is incorporated in this Contract by this reference, as if set forth herein in full.

1.5 ACQUISITION OF EASEMENTS

A. The District has obtained or is in the process of obtaining the easements required for this project.

B. If, at the time of Bids on this Contract, the District has not obtained all of the easements, it is anticipated that there may be additional stipulations and covenants on the remaining easements. It is also anticipated that the District may purchase certain items on easements, such as large trees within the permanent easement, thereby relieving the Contractor from the responsibility of restoring or protecting same. All bidders shall base their bids upon full restoration of all property within the easements unless otherwise specifically stated.

1.6 COVENANTS ON EASEMENTS NOT LISTED

A. Upon completion of obtaining the remaining easements, if any, the District and the successful Bidder will negotiate a Change Order to the Contract for any additional stipulations not payable under a unit bid price under this Contract.

B. Work shall not be started on any private right-of-way or easement until clearance is given the Contractor by the Engineer.

1.7 EASEMENT RELEASE

A. Where work is done on easements the Contractor shall obtain a written statement (see following form) of satisfactory restoration from each property owner involved, and furnish a copy of said statement to the Engineer. The statement will be required before the work will be accepted by the District, provided, however, that where the Contractor contends that the property owner is making unreasonable demands, he shall submit a list of such demands to the District in writing. If in the opinion of the District, such demands are unreasonable, the Contractor may be excused from the necessity of obtaining a written statement of satisfactory restoration from the property owner making such unreasonable demand.

EASEMENT NO. _____

CONTRACT NO. _____

PROPERTY OWNER'S APPROVAL OF EASEMENT RESTORATION

We, the undersigned owner(s) of property identified as

_____

(Address or Property Description)

do hereby approve and accept the restoration work done by

_____

the Contractor on the construction of pipelines on easements over and across my (our) property.

SIGNED _____

_____

DATE _____

1.8 CARE OF EXISTING FACILITIES

A. The Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, adjoining property, and structures, and to avoid damage thereto, and he shall at his own expense completely repair any damage thereto caused by his operation.

B. Access for firefighting equipment shall be maintained at all times.

1.9 SHORING, BRACING, ETC.

A. The Contractor shall shore up, brace, under-pin, and protect as may be necessary, all foundations and other parts of all existing structures adjoining the site of the Project, which are in any way affected by the excavation or other operations connected with the completion of the work under this Contract.

B. Whenever any notice is required to be given by the District or the Contractor to any adjoining or adjacent land owner or other party before commencement of any work under this Contract, such notice shall be given by the Contractor.

C. The Contractor shall indemnify the District and save it harmless from any damages on account of settlements or the loss of lateral or subjacent support of adjoining property and from all loss or expense and all damages for which the District may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

1.10 EMERGENCIES

A. Whenever the Contractor's work endangers the safety of life or property including adjoining property or property in the immediate proximity of the Project, the Contractor shall take all reasonable precautions to prevent threatened loss or injury therefrom.

1.11 EXISTING UTILITIES/FACILITIES - UNDERGROUND AND OVERHEAD

A. The Contractor shall protect existing utilities/facilities, both overhead and underground as provided in Section 02760.

1.12 TEMPORARY FENCE

A. The Contractor shall be responsible for the erection of temporary fence as required to protect his own work area.

B. The Contractor shall be responsible for erection and maintenance of temporary fencing or other facilities as required retaining livestock and/or periodic security of existing fenced areas.

C. Temporary fencing on facilities shall remain in place until the permanent fencing, as originally installed, is replaced under the restoration requirements of the Contract or as shown on the Contract Drawings.

* * * END OF SECTION * * *

SECTION 01550
ACCESS AND HAUL ROADS

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Lands and Right-of-Way: Section 21 General Conditions
B. Traffic Regulation: Section 01570

1.2 PRIVATE ACCESS

A. Where required by the Contract or choice of the Contractor access may be over private land.
B. Access will be maintained by and at the expense of the Contractor.
C. Comply with local regulations and permits.
D. Comply with all legal requirements to include as a minimum written permission of private owners.
E. Control dust, noise and traffic, in compliance with local laws and regulations.
F. Leave private property in condition satisfactory to the District and indicated by written release.

1.3 PUBLIC ACCESS AND HAUL ROADS

A. Comply with all laws and regulations.
B. All streets in the construction area used by Contractor's trucks or any other equipment hauling material to and from the area whether within the Contract limits or adjacent thereto shall be kept clean and shall be serviced by self-propelled pickup street sweepers to prevent the transport of sediment and other debris off the project site. Street sweepers shall be designed and operated to meet air quality standards.
C. Street washing with water will require approval by the Engineer.
D. Dust control shall continue until streets are accepted by the public agency responsible for maintenance or the Contractor is relieved of responsibility by such agency.
E. Any damage to roadway surfaces from the direct or indirect result of the Contractor's operation shall be repaired by the Contractor to the satisfaction of the responsible agency.

* * * END OF SECTION * * *

SECTION 01560
TEMPORARY CONTROLS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Water Courses: Section 21 General Conditions
B. Job Site Administration: Section 01043
C. Protection of Work and Property: Section 01545
D. Access and Haul Roads: Section 01550
E. Traffic Regulation: Section 01570
F. Landscape Restoration: Section 02990

1.2 LAWS

A. Requirements of federal, state and local statutes and regulations dealing with temporary controls described in this section shall be strictly adhered to by the Contractor.

1.3 CONSTRUCTION CLEANING

A. The Contractor shall keep the site of the work and other areas used by him in a neat and clean condition, and free from any accumulation of rubbish.
B. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste.
C. The Contractor shall keep his haul roads free from dirt, rubbish, and unnecessary obstructions resulting from his operations.
D. Equipment and material storage shall be confined to areas approved by the Engineer.
E. Disposal of all rubbish and surplus materials shall be off the site of construction, at the Contractor's expense, all in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws.

1.4 AIR POLLUTION CONTROL

A. The Contractor shall not discharge smoke, dust or other contaminants into the atmosphere that violate the regulations of any legally constituted authority.
B. The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent his operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity.
C. The Contractor shall comply with specific requirements of air quality control laws.
D. The Contractor shall be responsible for any damage resulting from any dust originating from his operations.
E. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the District.

1.5 POLLUTION CONTROL

A. Spill Prevention, Control and Countermeasures Plan
   1. The Contractor shall prepare a project-specific spill prevention, control and countermeasures (SPCC) plan to be used for the duration of the project. The SPCC shall meet the requirements below and the requirements of Section 1-07.15(1) Spill Prevention, Control and Countermeasures Plan of the Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction, latest edition. The plan shall be submitted to the Engineer prior to the commencement of any on site construction activities. The Contractor shall maintain a copy of the plan at the work site, including any

necessary updates as the work progresses. If hazardous materials are encountered during construction, the Contractor shall do everything possible to control and contain the material until appropriate measures can be taken. Hazardous material, as referred to within this specification, is defined in RCW 70.105.010 under “Hazardous Substances”. Occupational safety and health requirements that pertain to SPCC planning are contained in WAC 296-155 and WAC 296-62. The SPCC plan shall address the following project-specific information.

2. SPCC Plan Elements
    a. Site Information
        i. Identify general site information useful in construction planning, recognizing potential sources of spills, and identifying personnel responsible for managing and implementing the plan.
    b. Project Site Description
        i. Identify staging, storage, maintenance, and refueling areas and their relationship to drainage pathways, waterways, and other sensitive areas. Specifically address:
            1) The Contractor’s equipment maintenance, refueling, and cleaning activities
            2) The Contractor’s on site storage areas for hazardous materials
    c. Spill Prevention and Containment
        i. Identify spill prevention and containment methods to be used at each of the locations identified in 2. b.i. above.
    d. Spill Response
        i. Outline spill response procedures including assessment of the hazard, securing spill response and personal protective equipment, containing and eliminating the spill source, and mitigation, removal and disposal of the material.
    e. Standby, On-Site, Material and Equipment
        i. The plan shall identify the equipment and materials the Contractor will maintain on site to carry out the preventive and responsive measures for the items listed.
    f. Reporting
        i. The plan shall list all federal, state and local agency telephone numbers the Contractor must notify in the event of a spill.
    g. Program Management
        i. Identify site security measures, inspection procedures and personnel training procedures as they relate to spill prevention, containment, response, management and cleanup.
    h. Preexisting Contamination
        i. If preexisting contamination in the project area is described elsewhere in the plans or specifications, the SPCC plan shall indicate measures the Contractor will take to conduct work without allowing release or further spreading of the materials.
    i. Attachments
        i. Site plan showing the locations identified in 2.b. and 2.c. noted previously.
        ii. Spill and Incident Report Forms, if any, that the Contractor will be using.
    j. Implementation Requirements
        i. The Contractor shall be prepared and shall carry out the SPCC plan in the event of a hazardous spill within the project limits.

B. All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of

stormwater and is in accordance with the requirements of regulatory agencies. Good housekeeping and preventive measures shall be taken to ensure that the site will be kept clean, well organized, and free of debris.

C. All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
   1. On-site fueling tanks and petroleum product storage containers shall include secondary containment.
   2. Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
   3. In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
   4. Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

D. Chemical storage and use:
   1. All chemicals stored on the construction site shall have cover, containment, and protection.
   2. Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

E. Process water and slurry resulting from concrete work, grouting, sawcutting and surfacing operations shall be prevented from entering any stormwater system. It shall be disposed of in a manner that does not violate groundwater or surface water quality standards.

1.6 EROSION CONTROL

A. Contractor shall provide temporary erosion control work shown in the plans, required by state or local agencies during the life of the contract. This work is intended to provide prevention, control, and abatement of water pollution/erosion within the limits of the project, and to minimize damage to the work, adjacent property, streams, and other bodies of water.

B. The Contractor shall coordinate this temporary water pollution/erosion control work with the permanent drainage and erosion control work that may be specified in the Contract to the extent practicable to ensure that effective and continuous water pollution/erosion control is maintained during the construction of the Project.

C. Clearing and grubbing operations shall be so scheduled and performed that grading operations and permanent erosion control features can follow immediately. If the project conditions do not permit this scheduling, temporary water pollution/erosion control measures will be required between successive construction stages.

D. The area of excavation, borrow, and embankment operations in progress will be limited commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other permanent erosion control measures current according to the accepted schedule.

E. If the Engineer determines that water pollution and/or erosion could occur due to seasonal limitations, the nature of the material, or the Contractor's progress, temporary water pollution/erosion control measures shall be taken immediately.

F. The Engineer may require the Contractor's operations to be scheduled so that permanent erosion control features will be installed concurrently with or immediately following grading operations.

G. Compliance with the requirements of this section shall not relieve the Contractor from his responsibility to comply with other provisions of the contract.

1.7 NOISE CONTROL

A. Comply with state and local requirements as to allowable noise levels during construction.
B. Equip all internal combustion engines in vehicles and construction equipment with effective mufflers.
C. Prevent noise disturbance to adjoining property owners and the public.
D. Construction operations shall be restricted to between the hours of 7:00 AM and 10:00 PM Monday through Friday without specific approval by the District except in emergencies.

1.8 SANITARY PROVISIONS

A. The Contractor shall provide and maintain sanitary facilities for the use of his employees and the Engineer. The Contractor shall comply with the requirements and regulations of the agencies or organizations having jurisdiction over sanitary and health conditions and of other bodies or offices having jurisdiction thereover. He will permit no public nuisances.
B. The Contractor shall establish a regular collection of all sanitary and organic wastes.
C. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the District and in accordance with all laws and regulations pertaining thereto.

1.9 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture.
B. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.10 PROVISION FOR WATER COURSES

A. The Contractor shall provide for the flow of all water courses, sewers or drains, intercepted or disturbed by the Contractor during the progress of the work, and shall replace the same in as good condition as he found them or shall make such final provisions for them as necessary.
B. The Contractor shall not obstruct the gutter of any street, but shall use all proper measures to provide for the free passage of surface water.
C. The Contractor shall make provisions to take care of all surplus water, mud, silt, or other runoff pumped from excavations or resulting from sluicing or other operations, and shall be responsible for any damage, of whatever nature, resulting from his failure so to provide.
D. No direct payment shall be allowed for the above work. Payment for the cost thereof shall be included in the prices bid for the various items which comprise the improvement.
E. All work adjacent to or in the vicinity of marine waters or fresh water courses shall be accomplished in accordance with the requirements of the Departments having jurisdiction.

1.11 FISHERIES PERMIT

A. All construction work in the vicinity of existing creeks, rivers and lakes shall be subject to the provisions of state regulations.
B. A copy of any applicable permit is available at the office of the District for examination by bidders.
C. The Contractor shall conform to the requirements of the permits issued for this project.
D. Each Contractor shall secure separate approval from the Department of Fish and Wildlife concerning his proposed construction methods, operation and scheduling

which will affect the waterways or lakes, and shall conform to the requirements of these departments to preserve the aquatic resources. The authorized representatives of the Department of Fisheries shall be the sole judges as to the effect of the Contractor's operations on the aquatic life in the streams and waterways.

E. In the event said Department waives jurisdiction or does not approve the Contractor's method of operations, the Contractor shall secure written notice to that effect prior to construction.

F. The Contractor may be held liable for any damage to fish life or habitat which results from failure to comply with the provisions of this section.

1.12 ARCHAEOLOGICAL OR CULTURAL RESOURCES

A. The Contractor is advised that construction work within this Contract is subject to the provisions of state and federal laws and regulations pertaining to the preservation of archaeological and cultural resources.

B. In the event that any archaeological or cultural resources are uncovered during the course of construction, all work shall cease until an inspection and evaluation of the site has been made by an archaeologist to insure that archaeological data are properly preserved. The Contractor shall notify the District who will in turn notify the proper authorities.

C. The Contractor should anticipate reasonable delays while the archaeological investigations are being made and should make allowance for these delays under the appropriate bid items. No additional compensation will be allowed.

* * * END OF SECTION * * *

SECTION 01570
TRAFFIC REGULATION

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Safety and Health Regulations: Section 11.1 General Conditions
B. Land and Right-of-Way: Section 21 General Conditions
C. Access and Haul Roads: Section 01550

1.2 MATERIALS AND CONTRACT

A. Signs, warnings, light signals, bypass layouts, scheduling and routes shall conform to the requirements of U.S. Department of Transportation Federal Highway Administration "Manual on Uniform Traffic Control Devices", latest edition, as amended by local or state agency.

1.3 MAINTENANCE OF TRAFFIC

A. The Contractor shall conduct his work so as to interfere as little as possible with public travel, and shall at his own expense provide and maintain suitable bridges, detours, or other temporary facilities for the accommodation of public or private travel including mail delivery, and shall give reasonable notice to the owners of private drives before interfering with them; provided, however, that such maintenance of traffic will not be required where the Contractor has obtained permission from the owners or tenants of private property, or the proper public authority, or both, to obstruct traffic within the said limits and time agreed upon.
B. Access for firefighting equipment, police and ambulance services shall be provided at all times and the Contractor shall keep the local authorities informed at all times of the location of construction operations and fire lanes.
C. The Contractor shall also notify the authorities in charge of any municipal, private, or school transportation systems at least 48 hours in advance, of road closures that will force a change in the regular routing of the transportation system. The Contractor shall also provide maintain suitable detour routes for the system.
D. Highway and arterial crossings shall be made in such a way that no more than half of the roadway is closed to traffic at any time, except where suitable detours or other arrangements are agreed to by the agency having jurisdiction.

1.4 COMPLIANCE WITH LOCAL REQUIREMENTS

A. The Contractor shall comply with all applicable state and local requirements for closure of streets.
B. The Contractor shall provide barriers, guards, lights, signs, temporary bridges, flagmen and watchmen, advising the public of detours and construction hazards.
C. The Contractor shall also be responsible for compliance with additional public safety requirements which may arise during construction.
D. The Contractor shall furnish and install, and upon completion of the work, promptly remove all temporary signs and warning devices.
E. All usage of the right-of-way shall be for a lawful purpose and shall not breach the peace or adversely interfere with public use of the right-of-way. The location, time and date of the use must be in accordance with requirements. All temporary signs for directional control and warning must be approved, properly erected and removed immediately after termination of the use. The Contractor shall be liable for any expense, damages or cost required to return right-of-way to its condition prior to use by the Contractor or to an improved condition if specifically required by the conditions of the permit. Police escorts, control and inspections may be required. All materials used in use-related structures shall be of fire-retardant materials and subject to Fire Department requirements. Other conditions may be imposed at the discretion of the right-of-way inspector.

F. Construction in arterial right-of-way is only authorized between 9:00 a.m. and 3:00 p.m., Monday through Friday, without prior approval.
G. Construction in residential street right-of-way is only authorized between 7:00 a.m. and 7:00 p.m., Monday through Friday, without prior approval.
H. Unless otherwise authorized, the Contractor shall maintain at least one lane open at all times.
I. Countermanded traffic signals shall require the use of a Police Officer for traffic control.

1.5 TRAFFIC CONTROL PLAN

A. Temporary traffic control to ensure the traffic safety during construction activities must be provided. An approval plan is required prior to starting construction activities.
B. The traffic control plan shall minimize disruption to pedestrians. In the event of pedestrian disruption, the plan shall contain adequate pedestrian connections and clear signage.
C. Not less than ten days before beginning construction, the Contractor shall prepare and submit a general construction traffic control plan for the entire project, showing how detour routes will be signed and controlled.
D. The traffic control plan shall include and make provision for at least the following items:
    1. Maintain at least one lane of traffic during construction in all streets and roads wherever possible.
    2. Employ flag persons to direct traffic as required assuring safe vehicular traffic.
    3. Provide for the protection of pedestrians at all times.
    4. Where road closure is approved, provide, install and maintain all signs, barricades, posts, guards and notices whenever a street must be completely closed.
    5. Provide, install, and maintain all signs, barricades, posts, guards, and notices whenever a street must be completely closed.
    6. Provide for passage of local vehicles to businesses and homes.
    7. Provide for passage and access of emergency vehicles, police, fire, and disaster units at all times. Assume liability for any damages resulting from failure to provide said access.
    8. Revise and update specific traffic control plan to reflect changes in the project schedule as required by the District.
    9. Compliance with locally required bypass and construction sequence.

1.6 STORAGE OF MATERIALS AND EQUIPMENT

A. Materials or equipment shall not be stored where it will interfere with the free and safe passage of public traffic.
B. During work hours, only materials and equipment necessary for construction are allowed in the roadway. Materials or equipment shall not be stored where it will be hazardous.
C. During nonworking hours, the project site is to be left in a manner that is safe and protected from the public using the right-of-way. The Contractor shall remove all equipment and other obstructions from that portion of the roadway to be opened for use by public traffic at the end of each day's work and at other times when construction operations are suspended for any reason. Equipment and materials are not allowed in the right-of-way unless they are placed in a safe location or protected by permanent guardrails, lighted barricades or temporary concrete barriers (permitted only if approved by the right-of-way inspector).
D. Materials or other obstructions shall not be placed within 20 feet of fire hydrants, which shall at all times be readily accessible to the fire department, nor within ten

feet of United States mailboxes.

E. The location for parking and staging of materials and equipment shall be as agreed upon with the District or as arranged with private property owners. Use and restoration of private property used for parking, staging or storage of materials and equipment shall be the responsibility solely of the Contractor.

1.7 MAINTENANCE OF POSTAL SERVICE

A. The Contractor shall be responsible for determining and complying with the United States Postal Department's requirements for maintaining postal service within the project area and along related detour routes.

B. Where required by street closures or excessive interferences, the Contractor shall move mailboxes to temporary locations designated by the postal service and, when such closures are terminated, shall return the mailboxes to locations and conditions satisfactory to the owners and the postal service.

C. Other mailboxes removed or damaged by the Contractor shall be placed to the satisfaction of the owners and the postal service within 24 hours of their removal or damage.

1.8 TEMPORARY STREET CLOSURES

A. Signs shall be posted in a conspicuous place at each end of the roadway to be closed and at all intersections associated and/or adjacent to the closed segment of the street.

B. The signs shall be posted no later than three (3) calendar days prior to the proposed closure.

C. Any residential street closures will require a detour plan, signage and a public notice published in the newspaper-of-record three (3) calendar days prior to the proposed closure

D. For all nonemergency arterial street closures, the publication of the closure is required in addition to posting signs a minimum of three (3) calendar days in advance, regardless of the length of closure.

E. The Contractor shall also notify authorities in charge of any municipal, private or school transportation system at least three (3) days in advance of road closures that will force a change in the regular routing of the transportation system,. The Contractor shall also provide and maintain suitable detour routes for the system.

F. For all street closures described above, the Contractor is required to notify in writing the following agencies a minimum of three (3) calendar days prior to the closure:
   1. The Police Department
   2. The Fire Department
   3. The School District

G. All temporary street closures, signage and notices must be approved in advance.

H. These standards shall be considered minimum; other notifications may be required as appropriate.

* * * END OF SECTION * * *

SECTION 01600
MATERIAL AND EQUIPMENT

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Royalties and Patents: Section 9 General Conditions

B. Shop Drawings, Project Data, Samples: Section 01340

1.2 PRODUCTS LIST

A. As soon as possible but not more than thirty (30) days after date of Notice to Proceed, submit to Engineer five (5) copies of complete list of all products which are proposed for installation as substitutions or product options.

B. Tabulate list by each specification section.

1.3 CONTRACTOR'S OPTIONS

A. Unless otherwise specifically provided, all workmanship, equipment, materials and articles incorporated in the work covered by the Contract are to be new and of the best available grade of their respective kinds.

B. For products specified only by reference standards, select any product meeting standards, by any manufacturer.

C. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or equivalent" after specified product, Contractor must submit request, as required for substitution, for any product not specifically named.

D. For products specified by naming only one product and manufacturer, there is no option, and no substitution will be allowed.

1.4 SUBSTITUTIONS

A. Within thirty (30) days after Notice to Proceed, Engineer will consider formal requests from Contractor for substitution of products in place of those specified.

B. Submit request for substitution in accordance with requirements for submittal of shop drawings (Section 01340) and the following additional requirements.

1. For construction methods:
   a. Detailed description of proposed method
   b. Drawings illustrating methods
2. Itemized comparison of proposed substitution with product or method specification.
3. Data relating to changes in construction schedule.
4. Accurate cost data on proposed substitution in comparison with product or method specified.

C. In making request for substitution, Contractor represents:

1. He has personally investigated proposed product or method, and determined that it is equivalent or superior in all respects to that specified.
2. He will provide the same guarantee for substitution as for product or method specified.
3. He will coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.
4. He waives all claims for additional costs related to substitution which consequently becomes apparent.
5. Cost data is complete and includes all related costs under his Contract, but excludes costs under separate contracts and Engineer's redesign costs. Contractor agrees to pay for all costs under separate contracts and Engineer's redesign costs.

D. Substitutions will not be considered if:
   1. They are indicated or implied on shop drawings or project data submittals without formal request submitted in accord with Section 01340.
   2. Acceptance will require substantial revision of Contract Documents.
E. The above shall not be construed to mean that any substitution for materials and equipment will be allowed. The Engineer reserves the right to reject and disapprove any request he deems irregular or not in the interest of the District.

1.5 MATERIAL CERTIFICATION

A. Upon request of the Engineer, the Contractor's material suppliers may be required to furnish a certification from a recognized testing laboratory, certifying that the material supplied is in full conformance with the Contract Documents.

1.6 ADDITIONAL ENGINEERING COSTS

A. Additional engineering costs accruing as a result of checking and/or redesign of substitutions will be charged to the Contractor and billed by the District at the Engineer's current established rates.

1.7 INSTALLATION

A. All materials, appliances, fixtures, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with such instructions as are commonly furnished by the manufacturers, unless herein specified to the contrary.
B. The Contractor shall use experienced millwrights, acceptable to the Engineer, in the installation and aligning of the equipment.
C. At least one copy of the installation instructions shall be furnished to the Engineer no later than four days after the equipment arrives on site.
D. Manufacturers' instructions for handling, protecting, installation, lubrication and alignments of the equipment, shall be followed to the letter and these installation instructions shall be considered a part of this Contract, with attendant penalties for insufficient performance.
E. No piping or valves shall be supported by means of its connection to any mechanical equipment. Pipe connections to equipment must be disconnected upon request to permit inspection and determination that the piping is not transmitting stresses to the equipment.
F. All motor flexible couplings shall be disconnected and checked with an indicator for misalignment after all other installation work has been completed unless the equipment installation instructions specifically prohibit this.
G. The Contractor must allow a representative of the District to observe the indicator readings and approve or disapprove prior to re-coupling.

1.8 PUMPS AND PIPING

A. All pump and piping installations shall fully meet the standards of the Hydraulic Institute.

* * * END OF SECTION * * *

SECTION 01650
TESTING, STARTUP AND OPERATION

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Testing Laboratory Services: Section 01410
B. Inspection Services: Section 01420
C. Temporary Water: Section 01515
D. Contract Closeout: Section 01700
E. Operation and Maintenance Data: Section 01730

1.2 RESPONSIBILITY

A. Testing, startup and operation shall not be cause for claims for delay by the Contractor and all expenses accruing therefrom, shall be deemed to be incidental to the Contract.
B. The Contractor shall provide all materials, supplies and labor necessary to efficiently complete the testing, startup and operation.
C. All power and utility bills shall be paid by the Contractor up to and including the day of final acceptance of the Contract by the District. If not paid, these charges shall be treated as claims against the Contractor.
D. If the District chooses to commence operations prior to final acceptance, the District will assume payment of all power and utility charges effective the day that operation is assumed by the District and notice is given in writing.

1.3 SCHEDULE

A. Placing all phases of the project in service shall consist of three parts: testing, starting and operations.
B. Not less than thirty (30) days before anticipated time for beginning the testing, the Contractor will submit to the Engineer for approval, a complete plan for:
    1. Schedules for tests.
    2. Detail schedules of procedures for startup.
    3. Complete schedule of events to be accomplished during startup.
    4. Schedule operator training as specified.
    5. An outline of work remaining under the Contract that will be carried out concurrently with the operation phases.
C. Notify the Engineer of the approximate date that water or sewage will be required for operation.

1.4 TESTING

A. Testing shall consist of individual tests and checks made on equipment intended to provide proof of performance of units and proper operation of unit controls together with such necessary tests whether or not described elsewhere in these Specifications to assure proper alignment, size, condition, capability, strength, proper adjustment, lubrication, pressure, hydraulic tests, leakage tests and all other checks deemed necessary by the Engineer to determine that all materials and equipment are of specified quality, properly situated, anchored and in all respects ready for use.
B. All gravity sewer pipe and pressure piping shall be tested as required by these specifications and applicable codes.
C. Tests on individual items of equipment, pipelines, vessels, structures, tanks, controls and other items shall be as described in various sections describing such items.
D. Testing will be done by the Contractor in the presence of an Inspector designated by the Engineer. Records of all official tests will be made by the Inspector.

E. During tests, the Contractor shall correct any defective work discovered or that is not in first class operating condition.

1.5 STARTUP

A. Startup shall consist of testing by a simulated operation (using clear water to be furnished by the Contractor), all operational equipment and controls. The purpose of these tests shall be to check that all equipment will function under operating conditions, that all interlocking controls and sequences are properly set and that the facility will function as an operating unit.

B. Checks for leakage of tanks, ponds, piping, valves, gates and all other hydraulic systems and structures will be made.

C. Factory representatives of all major units will be present for the startup phase. The test shall continue until it is demonstrated that all dysfunction of controls and machinery are corrected.

D. The startup shall not begin until all tests required by these Specifications have been completed and approved by the Engineer.

E. The Contractor may, if approved by the Engineer, conduct the hydraulic testing of pumps, aerators and other equipment requiring large volumes of liquid simultaneously with the startup test. If required by the District, the Contractor shall dispose of the water used by pumping to waste.

1.6 OPERATION

A. Operation of the facility shall be immediately started after completion of testing and startup and after satisfactory repairs and adjustments have been made and providing supply and disposal facilities furnished by others are available. If these facilities are not available, the plant will be closed down and no further testing or operation by the Contractor will be required. The Contractor, however, will be responsible that all details required by the Contract shall remain in good order until final acceptance of the whole Contract.

B. The facility will be operated by personnel placed on the project by the District who will perform all duties and operate all equipment.

C. Taking possession and use of the facility shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.

D. If such prior use increases or causes refinishing of completed work, the Contractor shall be entitled to such extra compensation or extension of time or both, as the Engineer may determine.

* * * END OF SECTION * * *

SECTION 01700
CONTRACT CLOSEOUT

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Payments: Section 19 General Conditions
B. Certification and Final Payment: Section 20 General Conditions
C. Protection of Work and Property: Section 01545
D. Testing, Startup and Operation: Section 01650
E. Cleaning: Section 01710
F. Project Record Documents: Section 01720
G. Operation and Maintenance Data: Section 01730
H. Spare Parts and Maintenance Materials: Section 01750

1.2 SUBSTANTIAL COMPLETION

A. Contractor:
   1. After testing and startup, submit written certification to Engineer that Project or designated portion of Project is substantially complete.
   2. Submit list of items to be completed or corrected.
B. Engineer will make an inspection after receipt of Contractor's certification, together with District's representative.
C. If it appears to the Engineer that work is substantially complete:
   1. The Engineer may request of and the Contractor shall prepare and submit to Engineer, a list of items to be completed or corrected as determined by the inspection.
   2. If the Engineer then considers the work to be substantially complete, the Engineer may, with the District's approval, issue a Certificate of Substantial Completion, with appropriate conditions, accompanied by a list of the items to be completed and corrected, as verified and amended by Engineer. Omission of any item from the list shall not relieve the Contractor from responsibility to complete all the work in accordance with the Contract.
   3. District occupancy of Project or designated portion of Project:
      a. Contractor shall perform final cleaning in accordance with Section 01710.
      b. District may use all or part of the work prior to final project acceptance when, in the District’s discretion, the subject work is necessary for system operation.
   4. Contractor shall complete all the work within the time designated in the Certificate, or if not so designated within a reasonable time.
D. Should the Engineer consider that work is not substantially complete:
   1. He shall notify the Contractor, in writing stating reasons.
   2. Contractor shall complete work and send second written notice to Engineer certifying that Project or designated portion of Project is substantially complete.
E. Warranties: Under Section 22 of the General Conditions guarantee and warranty periods begin with the date of final acceptance. However, in connection with any specific equipment certified by the Engineer as completed and its use or operation thereof for its intended purpose is assumed by the District, the warranty period for such equipment shall begin with the beginning date of such use or operation.

1.3 FINAL INSPECTION

A. The Contractor shall submit written certification that:
   1. Contract Documents have been reviewed.
   2. Work has been completed in accordance with Contract Documents.
   3. Equipment and systems have been tested in presence of District's representative and are operational.

4. Project is completed, and ready for final inspection.

B. Engineer will make final inspection within a reasonable time after receipt of certification.

C. Should Engineer consider that work is complete in accordance with requirements of Contract Documents, he shall request Contractor to make project closeout submittals.

D. Should Engineer consider that work is not complete:
   1. He shall notify Contractor, in writing, stating reasons.
   2. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Engineer certifying that work is complete.
   3. Engineer will re-inspect work.

1.4 RE-INSPECTION COSTS

A. Should District or their Engineer be required to perform second inspections because of failure of work to comply with original certifications of Contractor, District will compensate Engineer for additional services and charge the Contractor for such fees at the District's and/or Engineer's currently established billing rate.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: To requirements of Section 01720

B. Guarantees, bonds and certifications required by these specifications: See Sections 16 and 22 of General Conditions and specific equipment or material specifications.

C. Spare parts and Maintenance Materials as specified in Section 01750.

D. At the close of the Contract the Contractor shall:
   1. Pay all utility bills if applicable
   2. Remove all electrical, sanitary, gas, telephone, water, offices and any other temporary service equipment that may remain.
   3. Arrange for transfer of electrical, and water accounts to the District's name.

E. Deliver evidence of compliance with requirements of governing authorities:
   1. Certificates of Inspection:
      a. Mechanical:
      b. As required by codes.
      c. Electrical:
         i. State or city as required.
         ii. Megger by electrical subcontractor.

1.6 POST-CONSTRUCTION INSPECTION

A. Prior to two years from Date of Final Acceptance, Engineer may make visual inspection of Project in company with District and Contractor to determine whether correction of work is required, in accordance with provisions of General Conditions.

B. District will promptly notify Contractor, in writing, of any observed deficiencies.

* * * END OF SECTION * * *

SECTION 01710
CLEANING

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Cutting and Patching: Section 01045
B. Temporary Controls: Section 01560
C. Contract Closeout: Section 01700

1.2 GENERAL REQUIREMENTS

A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish caused by operations.
B. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

1.3 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with the applicable federal, state and local safety standards.
B. Hazards Control:
   1. Store volatile wastes in covered metal containers, and remove from premises daily.
   2. Prevent accumulation of wastes which create hazardous conditions.
   3. Provide adequate ventilation during use of volatile or noxious substances.
C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:
   1. Do not burn or bury rubbish and waste materials on project site unless approved by local fire and air pollution authorities.
   2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3. Do not dispose of wastes into streams or waterways.

2. PRODUCTS

2.1 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

3. EXECUTION

3.1 DURING CONSTRUCTION

A. Execute cleaning to insure that grounds and public properties are maintained free from accumulations of waste materials and rubbish.
B. Wet down dry materials and rubbish to prevent blowing dust
C. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off District's property.
D. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
E. The Contractor shall clean the right-of-way, material sites and all ground the Contractor occupied to do the work periodically throughout the duration of the project. All rubbish, surplus materials, discarded materials and debris shall be removed from the site and disposed of properly. At the minimum, the Contractor shall conduct such periodic cleaning for each 1,000 feet of pipeline installed, prior to proceeding with installation of additional pipeline. Such cleaning shall also occur immediately prior to weekends, holidays, extended work stoppages or at the direction of the District, or other regulatory agencies having jurisdiction.

3.2 FINAL CLEANING OF STRUCTURES

A. Employ experienced workmen, or professional cleaners, for final cleaning.
B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
D. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.
E. Broom clean paved surfaces; rake clean other surfaces of grounds.
F. Clean windows.
G. Replace air conditioning filters if units were operated during construction.
H. Clean ducts, blowers and coils, if air conditioning units were operated without filters during construction.
I. Maintain cleaning until project is occupied by District.

3.3 FINAL CLEANUP OF PIPELINES

A. Final cleanup work shall be completed as closely behind the construction work as it is physically possible to do.
B. Unless otherwise specifically provided in writing only those portions of the completed work will be included in the partial pay estimates where, in the Engineer's opinion, the cleanup work has been satisfactorily completed.
C. Refer to specific sections for detail requirements for cleanup of pipelines.

3.4 GENERAL CLEANUP

A. Before final acceptance, the Contractor shall remove and obliterate, insofar as feasible, all objects or disturbances of the ground which mar the landscape and were caused by his operations, whether or not part of the improvement.
B. Rubbish, excess materials, temporary structures, and discarded equipment shall be removed and disposed of.
C. Temporary haul roads shall be scarified and bladed to blend with surroundings.
D. Remove snags, down trees, brush, and stumps.
E. Fill holes and grade to smooth land contours. Shape ends of cuts and fills to fit adjacent terrain.
F. Hand rake disturbed areas to remove loose objects including rock and clods in excess of two inches in any dimension.
G. Sweep pavement, curb and gutter, sidewalks and driveways.

* * * END OF SECTION * * *

SECTION 01720
PROJECT RECORD DOCUMENTS

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Documents: Section 6, General Conditions
B. Shop Drawings, Project Data and Samples: Section 01340
C. Operation and Maintenance Data: Section 01730

1.2 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of:
   1. Contract Drawings
   2. Project Manual
   3. Addenda
   4. Reviewed Shop Drawings
   5. Change Orders
   6. Other Modifications to Contract
   7. Field Test Records
   8. Maintenance Data Delivered with Equipment
B. Store documents in field office, apart from documents used for construction.
C. Provide files and racks for storage of documents.
D. Maintain documents in clean, dry, legible condition.
E. Do not use record documents for construction purposes.
F. Make documents available at all times for inspection by Engineer and District.

1.3 RECORDING

A. Do not permanently conceal any work until required information has been recorded.
B. Keep documents current.
C. Contract Drawings: Legibly mark to record actual construction:
   1. Depths of various elements of foundation in relation to variances from plan.
   2. Horizontal and vertical location of underground utilities and appurtenances and references to permanent surface improvements.
   3. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
   4. Field changes of dimension and detail.
   5. Changes made by Change Order or Field Order.
   6. Details not on original Contract Drawings.
   7. Side sewer locations including stubs and tees.
D. Specifications and Addenda: Legibly mark up each Section to record:
   1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
   2. Changes made by Change Order or Field Order.
   3. Other matters not originally specified.
E. Shop Drawings: Maintain as record documents; legibly annotate drawings to record changes made after review.

1.4 SUBMITTAL

A. At completion of project, deliver record documents to Engineer.
B. Underground utilities, duct banks, process piping, and extent of all underground vaults and foundations shall be drawn to scale in AutoCAD 2011 electronic format or older version and shall be transmitted electronically and as sequential, 22”x34” full size paper drawings. Match lines shall be included and noted. Incorporate materials and quantity lists on drawings.
C. Conduits and underground electrical facilities (vaults, handholes, light post bases,

etc.) shall be legibly dimensioned, annotated, and drawn to scale on record documents.

D. Accompany submittal with transmittal letter, in duplicate, signed by the Contractor, or his authorized representative.

* * * END OF SECTION * * *

SECTION 01730
OPERATION AND MAINTENANCE DATA

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Material and Equipment: Section 01600
B. Testing, Startup and Operation: Section 01650
C. Contract Closeout: Section 01700
D. Spare Parts and Maintenance Materials: Section 01750
E. Material and Equipment Specified: All Divisions

1.2 DATA

A. The Contractor shall furnish the Engineer with five (5) bound copies of maintenance data on all machinery and equipment furnished under this Contract. The manuals shall include the following:
   1. Equipment operating and maintenance instructions: Equipment manufacturer's recommended step-by-step procedures for starting, operating, and stopping the equipment under specified modes of operation, including initial startup, normal operation, and emergency operation.
   2. Factory parts list: Generic title and identification number of each component part of the equipment, complete with exploded views of each assembly and weights of individual components weighing over 100 pounds. Provide interchangeability listings of all component sources and original manufacturer's part number.
   3. Detailed assembly and disassembly instructions.
   4. Equipment specifications and guaranteed performance data.
   5. Name, address and telephone of vendor and spare parts sources.
   6. Manufacturers' guarantees and warranties.
   7. Preventive maintenance procedures: Equipment manufacturer's recommended steps and schedules for maintaining the equipment. Maintenance procedures shall include preventive and corrective maintenance.
   8. Troubleshooting information including a tabular list of typical malfunctions and probable remedies.
   9. Overhaul instructions: Manufacturer's directions for the disassembly, repair, and re-assembly of the equipment and any safety precautions that must be observed while performing the work.
   10. Spare parts list: Manufacturer's recommendations of number of parts that should be stored by the District; any special storage precautions that may be required, current list price of the parts; name, address, and phone number of the nearest parts supplier. Spare parts list shall be limited to those spare parts which the manufacturer recommends be maintained at the site. Spare parts list shall indicate (1) those parts provided as part of this contract, and (2) those parts with an anticipated delivery time of greater than two months.
   11. Exploded views of mechanical equipment shall be provided, unless specified in the equipment description as not required; when exploded views are specified as not necessary, cut or section views shall be provided with detailed callouts.
   12. Additional information as required in the Technical Specifications.
B. Control diagrams: Record diagrams showing internal and connection wiring.

1.3 QUALITY

A. Data shall be bound in first quality, heavy-duty, view type, permanent type 3-ring binders, 8 ½ inches by 11 inches, suitable for bookshelf storage. Binder ring size shall not exceed 3 inches.

B. Manuals shall be assembled with a table of contents and indexed with tab sheets so that information on any piece of equipment can be readily found.
C. The manufacturer's manual shall be appropriately labeled with the equipment name and equipment number as it appears in the specifications on the cover and the spine of the binder.
D. If manufacturer's standard instruction and maintenance manuals are used to describe operating and maintenance procedures, such manuals shall be modified to reflect only the model or series of equipment used on this project. Extraneous material shall be crossed out neatly or otherwise annotated or eliminated.

1.4 FORM

A. The operating and maintenance instructions shall be the first item listed for each piece of equipment. It shall include, in addition to necessary details, a "summary of maintenance" substantially in the following format:
    1. Name of item.
    2. Name of manufacturer.
        a. Address.
    3. Name plate information, including model numbers and serial numbers.
    4. Nearest local representative and nearest supplier of the manufacturer’s equipment, parts, and service.
        a. Addresses.
        b. Telephone numbers.
    5. Maintenance checklist form shall include:
        a. Maintenance requirements.
        b. Date or frequency .
        c. Lubrication information, including the type of required lubricant, if applicable.
    6. Provide a list of acceptable lubricant from at least (3) manufacturers whose products are locally available. Spare parts list (of items to be kept on hand).
B. The second item of each listing shall be a detailed narrative description of both the equipment and control circuits and a description of the recommended method for trouble shooting.
C. The third item of each listing shall be the lubrication chart required in Section 01750 followed by drawings, charts and details.

* * * END OF SECTION * * *

SECTION 01750
SPARE PARTS AND MAINTENANCE MATERIALS

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Operation and Maintenance Data: Section 01730

B. Specific Requirements for Individual Items: All Divisions

1.2 SPARE PARTS

A. All equipment shall be furnished with spare parts as recommended by the manufacturer. All bearings, bushings and shaft sleeves shall be "export" packaged.

B. Additional spare parts shall be furnished when specifically listed under any products.

1.3 LUBRICANTS

A. The Contractor shall have a lubricant manufacturer's representative inspect each piece of new equipment and make a maintenance chart on which shall be shown, in a list, each item of equipment requiring lubricant, the type and quantity of lubricant required, the frequency of lubrication required and a space for the last date that each piece of equipment was lubricated.

B. The Contractor shall provide a one year's supply of every kind of packing grease, or oil required for new equipment.

C. The Contractor shall furnish all oil cans, grease guns and all other necessary items for proper lubrication.

D. Lubrication charts shall be included in the maintenance manual.

* * * END OF SECTION * * *

INDEX
DIVISION 2 - SITE WORK

SECTION 02050
DEMOLITION

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Site Clearing: Section 02110
B. Excavating, Backfilling and Compacting for Utilities: Section 02222
C. Pavement Repair and Resurfacing: Section 02575

1.2 PROTECTION

A. Streets, roads, adjacent property and other work to remain shall be protected throughout the work.
B. Pavement may be cut only where authorized and only to the extent specified.
C. Anything not identified to be demolished or removed, damaged by Contractor's operations, shall be replaced as new by Contractor at Contractor's expense.

1.3 CUTTING PAVEMENT, CURBS AND WALKS

A. Unless specified otherwise by the authority having control over the pavement, curbs and walks, cutting and replacement shall be as specified in Section 02575.

1.4 PRIVATE DRIVEWAYS, CULVERTS AND MISCELLANEOUS

A. Pipe laying operations in certain areas may necessitate temporary removal of mail boxes, private driveways, drains, service lines, conduits, etc. to facilitate construction. In the event that the Contractor finds it necessary to remove the above mentioned items, it is to be understood that it will be his responsibility to restore these items in a manner equal to their original condition. The Contractor shall maintain adequate temporary provisions for domestic deliveries and utilities service and access to firefighting equipment.
B. The preceding requirement will be the same for any temporary removal of road culverts, whether under state, county or private jurisdiction.
C. The cost of the above described work shall be included in the price bid for pipe and no additional compensation shall be made to the Contractor.
D. The Contractor shall make every effort to prevent blocking private driveways for more than a reasonable time and shall make such driveways immediately accessible on order of the District.

1.5 REMOVAL OF STRUCTURES

A. The Contractor shall raze, remove, and dispose of all buildings and foundations, structures, fences, and other obstructions that are indicated in the drawing.
B. Remove foundations to a depth of at least 5 feet below finished ground elevation or subgrade elevation, whichever is lower.
C. Break up basement floors to promote drainage.
D. Fill basements or other cavities left by the removal of structures to match the level of surrounding ground.
E. When salvageable material is to remain the District's property, the Contractor shall remove it and deliver it to site designated by the Engineer or project documents. Any material not designated as the District's property will belong to the Contractor. The Contractor shall store or dispose of such material at suitable disposal site or at his storage yard.
F. Work crews shall be provided with proper protective clothing and equipment.
G. Waste and abandoned asbestos materials and materials, clothing, etc. used in asbestos handling and removal shall be disposed of in a manner consistent with the regulations and provisions cited above.

H. All costs associated with the demolition and abandonment of asbestos material shall be considered incidental to the work; no additional compensation will be made to the Contractor.

I. The Contractor (person or organization removing asbestos with certified asbestos workers) shall assume ALL risk and all liability for the removal and disposal of the asbestos and the Contractor shall comply with all federal, state and local laws, statutes and regulatory agency regulations and requirements including but not limited to the requirements relating to environmental pollutants and the requirements relating to the removal and disposal of asbestos. The Contractor shall insure that the asbestos removal is pursuant to all state and federal laws and regulations. The Contractor shall be responsible for any and all fines or penalties which may be levied due to the Contractor's violation of any of the aforementioned laws and regulations.

1.6 ASBESTOS REMOVAL

A. The Contractor shall conduct all work related to existing asbestos materials in accordance with WISHA safety regulations and provisions of WAC 296-62-077, WAC 295-65 and the requirements of the regional air pollution control authority. Advance notice of work on asbestos materials may be required.

B. Work crews shall be provided with proper protective clothing and equipment.

C. Waste and abandoned asbestos materials and materials, clothing, etc. used in asbestos handling and removal shall be disposed of in a manner consistent with the regulations and provisions cited above.

D. All costs associated with the demolition and abandonment of asbestos material shall be considered incidental to the work; no additional compensation will be made to the Contractor.

E. The Contractor (person or organization removing asbestos with certified asbestos workers) shall assume ALL risk and all liability for the removal and disposal of the asbestos and the Contractor shall comply with all federal, state and local laws, statutes and regulatory agency regulations and requirements including but not limited to the requirements relating to environmental pollutants and the requirements relating to the removal and disposal of asbestos. The Contractor shall insure that the asbestos removal is pursuant to all state and federal laws and regulations. The Contractor shall be responsible for any and all fines or penalties which may be levied due to the Contractor's violation of any of the aforementioned laws and regulations.

* * * END OF SECTION * * *

SECTION 02110
SITE CLEARING

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Demolition: Section 02050

B. Excavating, Backfilling and Compacting for Utilities: Section 02222

1.2 PROTECTION

A. Streets, roads, adjacent property and other work to remain shall be protected throughout the work.

2. PRODUCTS

2.1 MATERIALS

A. Materials shall be at the Contractor's option.

3. EXECUTION

3.1 SURVEY STAKING IN UN-CLEARED EASEMENTS

A. Centerlines of utility lines shall be flagged prior to clearing and it shall be the Contractor's responsibility to set his own offsets for clearing limits.

B. When the clearing is done, the survey for the utility construction shall be accomplished as per Section 01050.

C. If the controls or stakes are damaged or destroyed, the cost of replacement shall be at the expense of the Contractor.

3.2 CLEARING

A. Clearing work shall be performed within the confines of the area indicated on the Drawings, or in the Specifications.

B. Debris resulting from said clearing shall be disposed of by the Contractor and the right-of-way cleaned up in a neat and workmanlike manner.

C. No logs, stumps, rocks, etc., shall be left lying in the right-of-way or on adjacent property without specified written approval by the District.

D. All trees shall be felled within the area to be cleared except those marked to be left standing, or required by easement stipulations or by contract to be left standing. Trees shall be close cut parallel to the ground, removed and disposed of at the expense of the Contractor.

E. No trees or shrubbery in public right-of-way shall be cut except by approval of the Engineer.

3.3 GRUBBING

A. All trees or stumps within five (5) feet of the pipeline shall be removed.

B. Grubbing will be performed where designated on the drawings or as specified herein and shall include removal from the ground of all stumps, roots, buried logs and other vegetation not otherwise provided for and the removal and disposal of the refuse.

C. In areas to be filled to a depth of three (3) feet or more above the natural ground all tree stumps and brush shall be cut off not more than three (3) inches from the ground and removed.

D. Where unsuitable surface material is to be removed, complete grubbing will be required.

3.4 DAMAGED VEGETATION

A. Neatly trim torn limbs and trunk and severed roots.

B. Apply wound paint to above-ground wounds.

C. Remove and replace in kind all vegetation damaged extensively.

3.5 DISPOSAL

A. Contractor shall comply with all laws and rules that govern burning and shall secure necessary permits.
B. When burning is permitted, it shall be done under the constant care of competent watchmen such that surrounding property or vegetative cover is not damaged.
C. Contractor may sell any saleable material.
D. Material not burned or sold shall be hauled to a disposal site secured by the Contractor at his expense.

* * * END OF SECTION * * *

SECTION 02140
DEWATERING

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Temporary Controls: Section 01560
B. Excavating, Backfilling and Compaction for Utilities: Section 02222
C. Sedimentation Control: Section 02275

1.2 QUALITY CONTROL

A. It shall be the sole responsibility of the Contractor to control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence.
B. The Contractor shall employ an independent qualified Professional Engineer with experience in similar dewatering problems to review and approve the Contractor's proposed method of dewatering and to at least weekly, inspect the Contractor's operations and provide a report to the Engineer.
C. All dewatering operations shall be adequate to assure the integrity of the finished project and shall be the responsibility of the Contractor.
D. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points should be established and observed at frequent intervals to detect any settlement which may develop. Should significant settlement be observed, recharge wells could be placed between the structure and the trench and water pumped under pressure back into the soil.
E. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.

2. PRODUCTS

2.1 EQUIPMENT

A. Before operations begin, the Contractor shall have available on the site of work sufficient pumping equipment and/or other machinery to ensure that the operation of the dewatering system can be maintained.

3. EXECUTION

3.1 METHODS

A. Dewatering shall be done by such method as the Contractor may elect.
B. Dewatering, sufficient to maintain the groundwater level at or below the surface of trench bottom or base of the foundation gravel shall be accomplished prior to excavation and placing of pipeline or concrete. The dewatering operation, however accomplished, shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the excavation.
C. The normal water table shall be restored to its natural level in such a manner as to not disturb the pipe, its foundation and structures.
D. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check by the Contractor shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.
E. Dewatering of the excavations shall be considered as incidental to the construction and all costs thereof shall be included in various unit contract prices in the Bid Form.
F. Dispose of water so as not to cause injury to public or private property or to cause a nuisance or menace to the public and in accordance with the requirements of regulatory agencies.

G. Construction of temporary facilities to dispose of water shall be incidental to the construction.
H. Permanent piping systems shall not be incorporated in the dewatering system.

* * * END OF SECTION * * *

SECTION 02150
SHORING

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Excavating, Backfilling and Compacting for Utilities: Section 02222

1.2 QUALITY ASSURANCE

A. Where the depth of excavation exceeds 20 (twenty) feet the Contractor's shoring systems shall be designed and inspected by a registered professional engineer with experience in the work, all in accordance with federal, state and local safety requirements (the most stringent requirement prevailing).

B. Where the depth of excavation is less than 20 (twenty) feet, the Contractor shall provide, place and maintain responsibility for shoring, sheeting, bracing, sloping or otherwise support the sides of trenches and excavations, including embankments by a means of sufficient strength to protect employees. Such shoring and associated responsibilities shall be in accordance with federal, state and local safety requirements (the most stringent requirement prevailing).

1.3 SUBMITTAL

A. For shoring systems to be used for depth of excavation greater than 20 (twenty) feet, submit material indicating compliance with federal, state and local safety requirements for shoring systems. Specifically, the material shall indicate that such systems have been designed by a registered professional engineer with experience in the work.

1.4 COMPETENT PERSON

A. The Contractor shall be exclusively responsible for providing the services of the Competent Person as referenced in Section 296-155-650 Washington Administrative Code (WAC), relating to excavation, trenching and shoring.

B. The Contractor shall be exclusively responsible for providing the services of a registered professional engineer for the design of the trench protective system as required in WAC Section 296-155-657.

C. Representatives of the District and Engineer shall not be required to perform the roles of Competent Person or registered professional engineer as defined in WAC 296-155.

2. PRODUCTS

2.1 SHORING SYSTEMS

A. Materials used shall be at the Contractor's option.

3. EXECUTION

3.1 SAFETY REQUIREMENTS

A. Shoring shall be placed in accordance with federal, state and local safety requirements (the most stringent requirement prevailing)

3.2 SHORING SYSTEMS

A. Unless otherwise provided, the Contractor shall provide all shoring systems needed to protect the work, adjacent property and improvements, utilities, pavement, etc., and to provide safe working conditions in the trench.

B. Removal of any or all shoring systems from the trench shall be accomplished in such a manner as to fulfill all of the above requirements and shall also be accomplished in such a manner as to prevent any damage to the work.

C. Damages resulting from improper shoring or from failure to shore shall be the sole responsibility of the Contractor.

D. Whether shoring systems shall be left in place or removed shall be at the option of the Contractor, provided that removal of any and all shoring used in trench or structure excavation shall be accomplished in the manner as to prevent the settlement of the pipes or other work and to prevent increased backfill loading which might overload the pipe or walls of the structure.
E. Shoring shall be removed to a minimum of 5 feet below the final grade.
F. Should the District order that any shoring be left in place, the Contractor shall not remove the same but will receive payment for the materials left in place at the market value thereof.

3.3 SPECIAL REQUIREMENT FOR FLEXIBLE PIPE

A. Shoring to be removed, or moveable trench shields or boxes, shall be located at least 2 pipe diameters away from the pipe if the bottom of the shoring, shield or box extends below the top of flexible pipe, unless a satisfactory means of reconsolidating the bedding or side support material disturbed by shoring removal can be demonstrated.
B. Damages resulting from improper shoring or failure to shore shall be the sole responsibility of the Contractor.

* * * END OF SECTION * * *

SECTION 02202
ROCK EXCAVATION

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Demolition: Section 02050
B. Excavating, Backfilling, and Compacting for Utilities: Section 02222
C. Underground Utilities/Facilities - Underground and Overhead: Section 02760

1.2 DEFINITIONS

A. Solid rock, firmly cemented unstratified masses or conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting, and any boulder, masonry, or concrete except pavement and sidewalks and curbs, exceeding 2/3 cubic yard in volume.

1.3 QUALITY ASSURANCE

A. Assign a qualified blasting specialist of mature experience that is specialized in the use of explosives to the blasting operation, and maintain on a full-time basis during the time that blasting is in progress.
B. Blasting specialist shall have a valid state powder license, as required.
C. Comply with federal, state and local safety codes concerning transportation, handling, storage and use of explosives.
D. Comply with requirements of road agency when project is on public right-of-way.

1.4 SUBMITTAL

A. Schedule outlining time and locations of all drilling and blasting operations.
B. Pre-blast survey report shall be submitted prior to start of blasting.

1.5 PERMITS

A. Contractor shall be responsible for obtaining any federal, state, or local permits required for the transportation, storage, or use of explosives.

1.6 PRE-BLAST SURVEY

A. Contractor shall conduct a pre-blast survey of the interior and exterior of every structure identified as being within a zone of potential damage from adjacent blasting within a minimum of 100 feet each side of the blasting area.
B. Survey to be conducted by a person experienced in said surveys.
C. Prepare a photographic or video tape record outlining specific structural defects as well as general condition of each structure:
    1. Photographs shall be 3" x 5" minimum size, glossy finish, in color and unmounted.
    2. All photographs shall be taken by an acceptable commercial photographer hired by the Contractor.
    3. Each photograph shall be marked with date and identification.
D. Provide a written record including at least the following items:
    1. Date and time of inspection
    2. Name of inspector
    3. Location
    4. Signature of person granting the approval for inspection
    5. Name of person refusing approval to inspect
    6. Description of specific structural defects as well as general condition of each structure
    7. Other criteria recommended by blasting specialists
E. Provide the Engineer and District with one (1) copy each of the photographs and written report prior to start of any work within the area in question.

1.7 NOTIFICATION

A. The Contractor shall notify the Engineer, Police Department and Fire Department 24 hours in advance of detonating any charges.
B. Provide ample warning to all persons within the vicinity prior to blasting.
C. Erect warning signs.
D. Station personnel to warn people prior to blasting.

1.8 PAYMENT

A. No separate payment will be made unless a separate bid item is included in the bid form.

2. PRODUCTS

2.1 MATERIALS

A. Use explosive and initiators as recommended by the blasting specialist.
B. Use any standard cartridge explosives prepared and packaged by explosive manufacturing firms.

3. EXECUTION

3.1 TECHNIQUES

A. In excavating rock, the Contractor shall exercise care and use precautionary methods so as to not break down, loosen or otherwise damage the supporting rock below the subgrade line.
B. The Contractor shall be responsible for the methods used and for any damage resulting from his operations.
C. The slopes of all rock cuts shall be scaled and dressed to a safe, stable condition by removing all loose spalls and rocks not firmly keyed to the rock slope and by removing all overhanging rock which may be a hazard to workmen or public.
D. The Contractor shall drill, blast and excavate short test sections to determine the blasting method, hole spacing and charge best suited to the material encountered, in order to obtain the desired rock fracture, and make necessary adjustments.

3.2 PROTECTION

A. Contractor shall control flying rock by proper spacing of charges and by placing blast mats or mounding soil over the shots after loading.
B. Contractor shall control noise due to blasting by proper stemming and cover of blast holes, control of blasting during heavy cloud cover, and shall control time of blasting to conform to specific requirements at each site.
C. Air blast pressures exerted on structures shall be kept below limits which may damage the structure.
D. All damage caused by Contractor's blasting operations shall be repaired at no additional cost to the District. Contractor shall be responsible for receiving and negotiating claims for damage.

3.3 WASTE MATERIAL

A. All shot rock removed from the excavation must be hauled to a waste site secured by the Contractor unless the material can be used for backfill or embankment included in the project.
B. Material used in the project must conform to the requirements of these specifications.

3.4 LIMITS OF ROCK EXCAVATION

A. Excavate to minimum of 6 inches below bottom of pipe barrel and sufficient distance outside of pipe to install pipe and bedding.
B. Maximum width of trench shall be 24 inches wider than the pipe barrel.
C. Excavate to minimum of 6 inches below structure subgrade unless otherwise specified.
D. Excavate to subgrade for roadways.

* * * END OF SECTION * * *

SECTION 02222
EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Demolition: Section 02050
B. Site Clearing and Grubbing: Section 02110
C. Rock Excavations: Section 02202
D. Sedimentation Control: Section 02275
E. Water Lines: Section 02660
F. Sanitary Sewers: Section 02730
G. Sewer Force Mains: Section 02732
H. Existing Utilities/Facilities Underground and Overhead: Section 02760
I. Shoring: Section 02150

1.2 CLASSIFICATION

A. All excavation is unclassified unless separate bid item is included in bid form.
B. The terms earthwork or excavation include all materials excavated or removed regardless of material characteristics.
C. The Contractor shall make his own estimate of the kind and extent of materials which will be encountered in the excavation.

1.3 QUALITY CONTROL ASSURANCE

A. Soils and Backfill: Moisture density standard ASTM D1557 or AASHTO T-180 method unless otherwise specifically approved.
B. In place Density Determination: Sandcone method ASTM D1556 or Nuclear method ASTM D6938.
C. Classification of Soils: ASTM D2487.
D. Quality control monitoring of subgrade backfill and embankment materials and construction by certified independent laboratory approved by Engineer and secured and paid for by the Contractor.

1.4 SUBMITTALS

A. Import aggregate gradation and moisture density relationship curves.
B. Embankment and native backfill materials gradations and moisture density relationship curves.
C. Certification of gradation and compliance with referenced standards and moisture density relationship curve standards.
D. Density test results in approved format.
E. At any time the Contractor shall change the source and/or stockpile from which materials are obtained, certificates of gradation for these new sources will also be required. The Contractor shall make allowances in his unit prices bid for these items to cover expenses incurred in having this certification made and no additional compensation will be allowed.
F. During construction, the District may elect to have further gradation testing completed on the materials being furnished by the Contractor. This testing will be at the expense of the District, however, the Contractor shall provide material samples as may be necessary to complete this testing and these material samples will be furnished from material available on the job site or from the Contractor's source and/or supplier.
G. Controlled Density Fill (CDF): Furnish a certificate with each truckload of CDF product delivered to the site, indicating the composition and quality of the mix. Include size and weight of each aggregate, amount of cement, amount of water and amount and kind of any additives.

2. PRODUCTS

2.1 CRUSHED ROCK

A. Crushed rock shall be manufactured from ledge rock, talus, or gravel. The materials shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality test requirements:

Los Angeles Wear, 500 Rev.	35% max
Degradation Factor – Top Course	25 min.
Degradation Factor – Base Course	15 min.

B. Crushed rock shall meet the following requirements for grading and quality:

	Percent Passing by Weight	
Sieve Size	Base Course	Top Course and Keystone
1¼"	100	
1"	80-100	
¾"		100
⅝"	50-80	
½"		80-100
No. 4	25-45	46-66
No. 40	3-18	8-24
No. 200	7.5 max.	10.0 max.
% Fracture	75 min.	75 min.
Sand Equivalent	40 min.	40 min.

C. The fracture requirement shall be at least one fractured face and will apply to the combined aggregate retained on the No. 4 sieve in accordance with field operating procedures for AASHTO TP 61.

D. The portion of crushed rock retained on a No. 4 sieve shall not contain more than 0.15 percent wood waste.

2.2 GRAVEL BEDDING

A. Gravel bedding shall consist of crushed, processed, or naturally occurring material that is granular and well-graded. It shall be free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact and shall meet the following quality and gradation, when tested in accordance with ASTM D422:

Sieve Size	Percent Passing by Weight
¾"	99-100
⅜"	70-100
No. 4	55-100
No. 40	10-55
No. 200	3.0 max.
Sand Equivalent	35 min.

2.3 BACKFILL GRAVEL

A. All backfill gravel to be furnished under this Contract shall consist of naturally occurring screened or crushed gravel.

B. Gravel shall be essentially free from wood waste or other extraneous or objectionable materials.

C. Gravel shall have such characteristics of size and shape that it will compact readily, and the maximum particle size shall not exceed ⅔ of the depth of the layer being placed.

D. Gravel shall meet the following requirements for grading and quality:

Sieve Size	Percent Passing by Weight
2 ½ "	75-100
No. 4	22-100
No. 200	0-10

Dust Ratio	⅔ max.
Sand Equivalent	30 min.

E. Gravel material retained on a No. 4 sieve shall contain not more than 0.2 percent by weight of wood waste.

2.4 NATIVE MATERIAL

A. Material shall be selected soil free from roots or other organic material, debris, or frozen material.
B. The maximum size of the material shall be 6 inches with no stone larger than 4 inches in the upper 6 inches of fill.
C. Native material shall be free of excess moisture.
D. The material shall be processed to the uniform measure and texture necessary to obtain the specified density.

2.5 TRENCH FOUNDATION GRAVEL

A. At least two basic trench bottom conditions commonly cause problems: (1) where silty soils or fine sandy soils are encountered, they will usually flow in the presence of a stream of water, and (2) where clays, peats, or other soft materials are encountered, they may become saturated with water, but do not usually break down into fine particles and flow as do the silts or sands mentioned above.
B. Trench foundation gravel shall be used when over-excavation, as described in the Pipe Foundations paragraph under Execution in this section, is required.
C. Condition (1) material: Where Condition (1) is encountered, the following trench foundation gravel has been found by experience usually to be adequate: clean bank run sand and gravel, free from dirt, roots, topsoil, and debris and containing not less than 35% retained on a No. 4 sieve and with all stones larger than 2 inches removed. Such gravel shall only be used in a dry trench bottom, free from quicksand or running sand.
D. Condition (2) material: Where Condition (2) is encountered, Class A or Class B trench foundation gravel has been found by experience usually to be adequate. Other material may, however, be found more desirable by the Contractor:

	Percent Passing by Weight	
Sieve Size	Class A	Class B
2½”	98-100	95-100
2”	92-100	75-100
1½”	72-87	30-60
¾”	27-47	0-5
⅜”	3-14	—
No. 4	0-5	—

1. Trench foundation gravel shall contain no pieces larger than 5 inches, measured along the line of greatest dimension.

2.6 FILTER ROCK

A. Filter rock shall conform to the following gradation:

Sieve Size	Percent Passing by Weight
1”	100
¾”	95-100
⅜”	10-55
No. 4	5 max.
No. 200	0-1.5

B. Rock material retained on a No. 4 sieve shall contain not more than 0.2 percent by weight of wood waste.

2.7 RIGID INSULATION

A. Insulation shall be closed-cell, extruded polystyrene foam.

B. The insulation shall have a typical five year aged thermal conductivity, k factor of 0.2 Btu/hr/sq.ft./°F/in when tested at 75° F mean temperature in accordance with ASTM C518.
C. Minimum compressive strength of 25 psi when tested in the vertical direction in accordance with ASTM D1621.
D. Maximum water absorption of 0.3% by volume when tested in accordance with ASTM C272.

2.8 CONTROLLED DENSITY FILL (CDF)

A. CDF shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a non-segregating, self-consolidating and free-flowing material which will result in a hardened, dense, non-settling and excavatable fill.
B. CDF shall be used as fill above utilities wherever non-settling backfill is required or as a hydraulic barrier between coarse and fine grained soil.
C. CDF shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures which have been batched and mixed in accordance with Section 6-02.3 of the WSDOT/APWA Specifications. Materials are as follows:

1. Portland Cement	AASHTO M 85 OR WSDOT/APWA 9-01
2. Fly Ash	Class F
3. Aggregates	WSDOT/APWA 9-03.1(2)B
4. Water	WSDOT/APWA 9-25
5. Admixtures	WSDOT/APWA 9-23.6

D. CDF shall be used in the following proportions for one cubic yard. Batch weights may vary depending on specific weights of aggregates.
E. Maximum gallons of mixing water per cubic yard: 50.
F. Lbs. of cement per cubic yard: 50.
G. Lbs. of fly ash per cubic yard: 250.
H. Lbs. of dry aggregate per cubic yard, Class 1 or 2 sand as per WSDOT/APWA 9-03.1(2)B: 3200.
I. CDF shall be batched to provide a flowing, non-segregating mix with a slump between 6” to 8”.

3. EXECUTION

3.1 TRENCHING

A. Material shall be excavated from trenches and piled adjacent to the trench and maintained so that the toe of the slope of the spoil material is at least 2 feet from the edge of the trench or hauled from the trench to an approved disposal or storage site.
B. Material shall be piled in such a manner that will cause a minimum of inconvenience to public travel.
C. Free access shall be provided to all fire hydrants, water valves and meters, and clearance shall be left to enable the free flow of storm water in all gutters, conduits, and natural watercourses.
D. Ledge rock, boulders, or stones shall be removed to provide a minimum clearance of 6 inches under and around the pipe to be installed.
E. Contractor shall keep excavations free of water in accordance with Section 02140.
F. Contractor is responsible for shoring in accordance with Section 02150.

3.2 TRENCHING FOR WATER LINES

A. Trenching shall be dug to true and smooth bottom grades in accordance with the lines given by the Engineer.
B. Trench widths shall not exceed 30 inches maximum or 1.5 times outside diameter of the pipe plus 18 inches whichever is greater.

C. Standard excavation equipment shall be adjusted so as to excavate the narrowest ditch possible.
D. Depth of trenching for water mains shall be such as to give a minimum cover of 36 inches over the top of the pipe unless otherwise specified.
E. Deeper excavation may be required due to localized breaks in grade, or to install the new main under existing culverts or other utilities where necessary.
F. Where profile of pipeline and ground surface is shown on the Plans, pipeline shall be laid to elevation shown, regardless of depth.
G. Excavation shall be to such depth that the minimum cover over the valve nuts shall be one foot.
H. The length of trench excavated in advance of pipe laying shall be kept to a minimum and in no case shall length of open trench exceed 400 feet unless specifically authorized by the Engineer.
I. Trenches shall be over excavated below the specified grade to provide for bedding material specified.

3.3 TRENCHING FOR SEWERS AND DRAINS

A. Trenches must be of sufficient width to permit proper jointing of the pipe and back-filling of material along the sides of the pipe.
B. Trench width at the surface of the ground shall be kept to the minimum amount necessary to install the pipe in a safe manner.
C. Trenches wider than the maximum specified may result in a greater load of overburden than the pipe is designed for, and consequently, if the maximum trench width is exceeded by the Contractor, the Contractor shall at his own expense, provide pipe of higher strength classification, or provide a higher class of bedding where necessary to assure that the pipe will not be overloaded.
D. The normal maximum permissible trench width, at the bottom of the trench and up to a point at the crown of the pipe, shall be 1.5 times the inside diameter plus 18 inches, or a total of 40 inches, whichever is greater.
E. Excavation for manholes and other structures shall be sufficient to provide a minimum of 12 inches between their outside surfaces and the sides of the excavation.
F. The length of trench excavated in advance of the pipe laying shall be kept to a minimum, and in no case shall it exceed 150 feet unless specifically authorized by the Engineer.
G. Trenches shall be excavated below the barrel of the pipe a sufficient distance to provide for bedding material specified.

3.4 TRENCHING FOR SEWER FORCE MAINS

A. Trenches shall be dug to true and smooth bottom grade and in accordance with the lines given by the Engineer.
B. Trench widths shall not exceed 30 inches maximum or 1.5 times outside diameter of the pipe plus 18 inches whichever is greater.
C. Standard excavation equipment shall be adjusted so as to excavate the narrowest ditch possible.
D. The depth of trenching shall be such as to give a minimum cover of 48 inches over the top of the pipe unless otherwise specified.
E. Where profile of pipeline and ground surface is shown on the Plans, pipeline shall be laid to elevation shown regardless of depth.
F. No additional compensation will be allowed for small amount of deeper excavation which may be required, due to localized breaks in grade, or installing the force main under existing culverts or other utilities or where necessary for adjustment in grade required providing cover over air release valves.
G. Trench shall be graded so that there is an upward slope at all times from low point to high point.

H. The length of trench excavated in advance of the pipe laying shall be kept to a minimum and in no case shall length of open trench exceed 400 feet unless otherwise specifically authorized by the Engineer.
I. Trenches shall be over excavated below the specified grade to provide for bedding material specified.

3.5 PIPE FOUNDATIONS

A. Where the trench bottom is in a material which is unsuitable for foundation or which will make it difficult to obtain uniform bearing for the pipe, such material shall be removed and a stable foundation provided in accordance with Standard Detail entitled "Foundation Gravel and Backfill".
B. Proper preparation of foundation and placement of foundation material, where required, shall precede the installation of all pipe.
C. Proper preparation includes bringing the native trench bottom and/or the top of the foundation material to a uniform grade so that the entire length of pipe rests firmly on suitable, properly compacted material.
D. Gravel to be used for foundation purposes shall be of a type and gradation to provide solid compact bedding in the trench. Because trench conditions vary, foundation gravel requirements will change.
E. Neither approval nor disapproval of the foundation material proposed by the Contractor shall relieve him of his responsibility to provide adequate pipe foundation and to guarantee his work as elsewhere required by the Contract.
F. Unsuitable material for foundation purposes below the depth required for the specified bedding shall be removed and replaced with suitable foundation gravel.
G. Excavated materials shall be disposed of at an approved waste site and all costs involved in the excavating and wasting of this material shall be considered as incidental to the foundation item, except that excavation more than 2 feet below the pipe invert shall be classified as extra excavation and paid for at the Extra Excavation unit bid price.

3.6 PIPE BEDDING

A. Placement of gravel bedding in the pipe zone shall be as specified in the section regarding the pipeline being constructed.

3.7 BACKFILLING

A. Gravel bedding to 6 inches over the top of the pipe shall be completed before backfilling operations are started.
B. The Contractor shall take all necessary precautions to protect the pipe from any damage, movement or shifting. In general, backfilling shall be performed by pushing the material from the end of the trench into, along and directly over the pipe so that the material will be applied in the form of a rolling slope rather than by side filling which may damage the pipe. Backfilling from the sides of the trench will be permitted after sufficient material has first been carefully placed over the pipe to such a depth as to protect the pipe.
C. Compaction equipment used above the pipe zone shall be of a type that does not injure the pipe.
D. Provide for the proper maintenance of traffic flow and accessibility as may be necessary.
E. Make adequate provisions for the safety of property and persons.
F. Temporary shoring shall be removed unless specifically authorized in writing.
G. Dewatering shall be continued until the trench is completely backfilled.
H. Brush, stumps, logs, planking, disconnected drains, boulders, etc., shall be removed from the material to be used for backfilling the trench.
I. Where native material excavated is unsuitable for trench backfill, backfill gravel, or specified material shall be placed.

J. The unsuitable material shall be removed to an approved disposal area. Backfill gravel shall be used for backfill only where original material is unsuitable and upon approval by the Engineer.
K. Where it is required that a blanket of import material be placed on top of the native backfill, the backfill shall be placed to the elevations shown on the Plans, or to the elevation the Engineer may direct, and shall be leveled to provide for a uniform thickness of the import material. Compaction of the native material shall be as required by the District.
L. Backfill Gravel: Wherever a trench is excavated in a paved roadway, sidewalk or other area where minor settlements would be detrimental and where the native excavated material is not suitable for compaction as backfill, the trench shall be backfilled to such depth as the Engineer may direct with backfill gravel or specified material.
M. Controlled Density Fill: Controlled density fill shall be placed as shown on the drawings or wherever mechanical compaction cannot be achieved due to physical space and/or clearance limitations (not allowing access for mechanical compaction equipment) and where additional excavation to provide the required space and/or clearance is not practical or possible. CDF shall be used as fill above utilities wherever non-settling backfill is required as directed by the District.

3.8 GENERAL COMPACTION REQUIREMENTS

A. Requirements of this section shall apply unless more stringent requirements are established by the local agency involved.
B. When working in an existing traveled roadway, restoration and compaction must be achieved as the trench is backfilled so as to maintain traffic.
C. Trench backfill under roadway shall be mechanically compacted to 95% of maximum density.
D. When working in areas outside of the right-of-way or on easements, backfill compaction shall be achieved throughout the entire depth of the trench by mechanical compaction to 90% density.

3.9 MECHANICAL COMPACTION

A. Method of compaction shall be at Contractor's option.
B. The Contractor shall be responsible to provide the proper size and type of compaction equipment and select the proper method of utilizing said equipment to attain the required compaction density.
C. In place compaction tests may be made. Contractor shall remove and re-compact material that does not meet specified requirements.

3.10 INSULATION BOARD INSTALLATION

A. Prior to placement of the insulation board, the subgrade shall be leveled and compacted to provide a smooth, firm foundation.
B. Insulation board shall be placed 12 inches above the pipe line whenever shown on the drawing.
C. The insulation shall be 2 feet wide and extend 5 additional feet along the length of pipe after minimum cover has been achieved.
D. Insulation shall be anchored prior to backfilling using a minimum of two 6-inch by 3/8-inch wooden skewers per board, driven at an angle to the vertical and flush to the surface of the insulation.
E. Layering of insulation to obtain the specified thickness shall be allowed as long as all joints are overlapped at least 6 inches.

3.11 CONTROLLED DENSITY FILL (CDF)

A. Haul excavated material immediately to waste, install and bed pipe per Section 02660 and other applicable sections.

B. Mix and deliver CDF in commercial concrete ready mix trucks. CDF shall be discharged from the mixer by any reasonable means (which does not segregate the material) into the area to be filled.
C. Contain CDF at either end of the excavation by bulkhead or earth fill.
D. Place CDF using suitable equipment to avoid injury to or displacement of installed utility lines, manholes, and other structures. CDF shall not be placed on frozen ground.
E. Vibrate fill with concrete vibrators during placement for complete consolidation, 95% minimum.
F. Provide steel plates to span utility trench and prevent traffic contact with the CDF for at least 12 hours, but not more than 24 hours or until fill has set sufficient to prevent rutting.
G. Placement of CDF shall be scheduled during favorable weather conditions. At the time of placement, CDF must have a temperature of at least 40° F. Mixing and placing shall stop when the temperature is 38° F or less and falling. Each filling stage shall be as continuous an operation as practical.

* * * END OF SECTION * * *

SECTION 02275
SEDIMENTATION CONTROL

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Excavating, Backfilling and Compacting for Utilities: Section 02222
B. Landscape Restoration: Section 02990

1.2 QUALITY CONTROL

A. Conform to regulatory requirements.
B. Sedimentation control systems depicted on drawings are intended to be minimum requirements to meet anticipated site conditions.

1.3 SCHEDULE

A. Required sedimentation control facilities must be constructed and in operation prior to land clearing and/or other construction to ensure that sediment-laden water does not enter the natural drainage system or otherwise be discharged from the site.
B. Sediment facilities shall be maintained in a satisfactory condition until such time that clearing and/or construction is completed and potential for on-site erosion has passed.
C. The implementation, maintenance, replacement and additions to erosion/sedimentation control systems shall be the responsibility of the Contractor.

2. PRODUCTS

2.1 PLANTING MATERIALS

A. Refer to Section 02990

2.2 STRAW

A. Be in an air dried condition free of noxious weeds, weed seeds, and other materials detrimental to plant life.
B. Be seasoned before baling or loading and shall be acceptable to the Engineer.

2.3 JUTE MATTING

A. Be of a uniform open plain weave of unbleached, single jute yarn treated with a fire retardant chemical.
B. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than 1/2 of its normal diameter.
C. Furnished in rolled strips 48 inches wide by approximately 50 yards long.
D. Average weight of 0.92 pounds per square yard with an allowable tolerance of plus or minus 1 inch in width and 5% in weight.

2.4 FILTER FABRIC

A. Filter fabric for the erosion protection barriers shall be Mirafi 140, or equivalent.

2.5 WIRE

A. Wire for the erosion protection barriers shall be 2 x 2 mesh, 14 gauge galvanized wire.

2.6 SUPPORT POSTS

A. Support posts for the erosion protection barriers shall be 2 inch by 4 inch, Doug-FR No. 1 or better wood posts or 1-1/2 inch by 48 inch medium weight steel fence posts.

2.7 CLEAR PLASTIC COVERING

A. Clear plastic covering for protection of slopes and cuts shall meet the requirements of the NBS Voluntary Product Standard, PS 17 for Polyethylene sheeting having a minimum thickness of 6 mil.

2.8 SEDIMENT RETENTION WATTLE

A. Wattles shall be a straw-filled tube of flexible netting material exhibiting the following properties. It shall be a machine-produced tube of compacted rice straw that is Certified Weed Free Forage, by a manufacturer whose principle business is wattle

manufacturing. The netting shall consist of seamless, high-density polyethylene and ethyl vinyl acetate and contain ultra violet inhibitors

3. EXECUTION

3.1 EROSION CONTROL

A. Erosion control provisions shall meet or exceed the requirements of the local agency having jurisdiction.
B. When provisions are specified and shown on the Drawings, they are the minimum requirements.
C. Contractor shall not permit sediment laden waters to enter drainage facilities or be discharged from the site.
D. As construction progresses and seasonal conditions dictate, more siltation control facilities may be required. It shall be the responsibility of the Contractor to address new conditions that may be created and to provide additional facilities over and above minimum requirements as may be required.

3.2 SILTATION/SEDIMENTATION PONDS

A. Siltation/sedimentation ponds shall be installed on site to de-silt all stormwater or water pumped from excavations.
B. If additional siltation control is required, check dams or silt fences may be placed in ditches receiving stormwater from areas disturbed by construction.
C. Siltation/sedimentation ponds shall be constructed in accordance with the requirements of the agencies having jurisdiction over the project area and/or the facilities that will receive discharge from siltation/sedimentation ponds.

3.3 FILTER FABRIC FENCES

A. Filter fabric fence shall consist of filter fabric fastened to wire fabric with staples or wire rings.
B. Wire shall be fastened to posts set at 4-foot centers.
C. Fabric shall be buried into ground approximately 8 inches to prevent silt from washing under fabric.
D. Fence shall be located to catch silt and prevent discharge to drainage courses.

3.4 STRAW BALE FILTER

A. Installed in drainage way to catch silt.
B. Dig bales into ground approximately 6 inches and stake in place with 2 wooden stakes in each bale.
C. Bales to extend above anticipated surface of stream.

3.5 SEDIMENT RETENTION WATTLE

A. Install wattles in the trench, insuring that no gaps exist between the soil and the bottom of the wattle. The ends of adjacent wattles should be tightly abutted so that no opening exists for water or sediment to pass through. Alternately, wattles may be lapped, 6" minimum to prevent sediment passing through the field joint.
B. Wooden stakes should be used to fasten the wattles to the soil. When conditions warrant, a straight metal bar can be used to drive a pilot hole through the wattle and into the soil.

3.6 PLACING JUTE MATTING

A. Seed and fertilizer shall be placed prior to placing of matting.
B. Jute matting shall be unrolled parallel to the flow of water. Where more than 1 strip of jute matting is required to cover the given area, it shall overlap the adjacent mat a minimum of 4 inches. The ends of matting shall overlap at least 6 inches with the upgrade section on top.
C. The up-slope end of each strip of matting shall be staked and buried in a 12-inch wide by 6-inch deep trench with the soil firmly tamped against the mat. Three stakes per width of matting (1 stake at each overlap) shall be driven below the finish ground line prior to backfilling of the trench.

D. The Engineer may require that any other edge exposed to more than normal flow of water or strong prevailing winds be staked and buried in a similar manner.
E. Check slots shall be placed between the ends of strips by placing a tight fold of the matting at least 6 inches vertically into the soil. These shall be tamped and stapled the same as upslope ends. Check-slots must be spaced so that one check slot or one end occurs within each 50 feet of slope.
F. Edges of matting shall be buried around the edges of catch basins and other structures as herein described. Matting must be spread evenly and smoothly and in contact with the soil at all points.
G. Matting shall be held in place by approved wire staples, pins, spikes or wooden stakes driven vertically into the soil. Matting shall be fastened at intervals not more than 3 feet apart in 3 rows for each strip of matting, with 1 row along each edge and 1 row alternately spaced in the middle. All ends of the matting and check slots shall be fastened at 6-inch intervals across their width. Length of fastening devices shall be sufficient to securely anchor matting against the soil and driven flush with the finished grade.

3.7 PLACING CLEAR PLASTIC COVERING

A. Clear plastic covering shall be installed on erodible embankment slopes as shown in the plans or as designated by the Engineer.
B. The clear plastic covering shall be installed immediately after completion of the application of roadside seeding.
C. The Contractor shall maintain the cover tightly in place by using sandbags or tires on ropes with a minimum 10-foot grid spacing in all directions. All seams shall be taped or weighted down full length. There shall be at least a 12-inch overlap of all seams.
D. The Contractor shall be responsible to immediately repair all damaged areas.
E. The clear plastic covering shall be replaced or removed within 6 months of installation.

3.8 EXISTING DRAINAGE FACILITIES

A. Should a storm sewer or culvert become blocked or have its capacity restricted due to discharge siltation from Contractor's operations, the Contractor shall make arrangements with the jurisdictional agency for the cleaning of the facility at no additional expense to the District.

3.9 DRAINAGE DIVERSION

A. Contractor shall divert the surface runoff water around the site as may be required.
B. Drainage shall be restored to condition existing prior to construction unless otherwise shown on the Drawings.

* * * END OF SECTION * * *

SECTION 02300
PIPE BORING AND JACKING

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Sanitary Sewers: Section 02730

1.2 REQUIREMENTS OF CONTROLLING AGENCY

A. All work shall be done in accordance with the requirements of the road or railroad agency in control of the facility being bored or jacked.

2. PRODUCTS

2.1 MATERIALS

A. All materials selected by the Contractor shall meet the minimum requirements of the controlling agency or the construction requirements.

B. Where casing size and thickness is shown on drawing it is minimum size and thickness permitted. Contractor is permitted to use larger size or thicker walled casing if in his opinion; it is required because of soil or other job conditions. Contractor shall make his own determination regarding casing requirements.

C. Minimum thickness of casing wall shall meet requirement of road or railroad agency involved.

3. EXECUTION

3.1 INSTALLATION OF ENCASING PIPE

A. Where shown on the Plans, the Contractor shall install the pipe in a large encasing pipe.

B. The encasing pipe shall be installed by jacking, tunneling, augering or by a combination of these methods.

C. The encasing pipe shall normally extend from ditch line on each side of the pavement or as shown on the drawings or in the road permit. No excavation shall be made closer than 6 feet from the edge of the pavement or as directed by the road or railroad agency. Exact length shall be approved by the road or railroad agency involved.

D. During jacking, augering, or tunneling operations, care shall be exercised to prevent caving ahead of the pipe which will cause voids outside the pipe. If voids occur, the Contractor shall backpack the voids with sand and pea gravel and fill the voids with a pumped Portland cement grout.

3.2 TUNNELING

A. Tunneling will not be allowed except by the liner plate method and unless approved by the road or railroad agency involved.

B. Liner plates shall be assembled and installed in accordance with the manufacturer's instructions and specifications and in accordance with accepted tunneling methods using poling plates or shields of a strength equal to that of the liner plates.

3.3 CARRIER PIPE INSTALLATION

A. The pipeline shall be skidded into position inside the casing pipe using suitable skids and blocked into position.

B. The annular space between the carrier pipe and the casing pipe or tunnel liner shall be filled by sluicing or blowing sand or pea gravel into the space unless otherwise specified. Care shall be exercised to ensure that the entire space is filled and that the pipe is not disturbed during the placement of the backfill between the pipe and the casing.

C. The Contractor shall remove the carrier pipe and reinstall it if the pipe is not within the tolerances shown on the drawings and as specified.

* * * END OF SECTION * * *

SECTION 02575
PAVEMENT REPAIR AND RESURFACING

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Traffic Regulation: Section 01570
B. Demolition: Section 02050
C. Site Clearing: Section 02110
D. Excavation, Backfilling, and Compacting for Utilities: Section 02222

1.2 QUALITY ASSURANCE

A. Qualifications of Asphalt Concrete Producer: Use only materials which are furnished by a bulk asphalt concrete producer regularly engaged in production of hot mix, hot laid asphalt concrete.

1.3 PAVING QUALITY REQUIREMENTS

A. General: In addition to other specified conditions, comply with following minimum requirements:
   1. Comply with requirements of Road Agency having jurisdiction.
   2. Provide final surfaces of uniform texture, conforming to required grades and cross-sections.
   3. Patches shall match existing grade and cross-section unless otherwise directed by the Road Agency.
   4. Pavement cuts parallel to street alignment shall be restored for the full width in accordance with agency specifications.
   5. Unsatisfactory restoration work shall be redone promptly by the Contractor. This includes immediately replacing failed patches.
   6. Cleanup of excavation and debris material shall be accomplished concurrently with the burying operation. At no time shall debris and excavation extend along a line for more than three hundred (300) feet.
   7. Any temporary restoration work shall be made permanent within thirty (30) calendar days from the date of the temporary restoration.

B. Surface Smoothness:
   1. Test finished surface of each asphalt concrete course for smoothness, using a 10 foot straight edge applied parallel to and at right angles to centerline of paved areas.
   2. Surfaces will not be acceptable if exceeding 0.25 inch in 10 feet unless more rigid requirements are established by the Road Agency.

1.4 SUBMITTALS

A. Certify that materials comply with specification requirements.
B. Certificate to be signed by asphalt concrete producer and Contractor.
C. Submit concrete mix design.

1.5 JOB CONDITIONS

A. Weather Limitations:
   1. Construct only when temperatures are above minimum specified in State Highway Standard Specifications unless waived by Road Agency having jurisdiction.
   2. Do not construct pavement or base when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.

B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.
C. Traffic Control:

1. Maintain vehicular and pedestrian traffic during paving operations, as required for other construction activities.
2. Provide flagmen, barricades, warning signs, and warning lights for movement of traffic and safety and to cause the least interruption of work.
3. See Section 01570 for additional requirements.

1.6 ROAD AND STREET RESTORATION REQUIREMENTS

A. The Contractor's responsibility as to road restoration shall include, but not be limited to, proper backfill and compaction of excavation, shaping and general restoration of the roadway, restoration of public and private improvements when damaged by construction, restoration of drainage facilities, scarification of existing surfacing, if required, removal of debris and surplus material and all other requirements of these Specifications. In addition, upon completion of the above restoration, backfill gravel or crushed rock shall be placed where required, in the opinion of the Engineer.

B. Unless otherwise specifically authorized by the authority responsible for the roadway, the final grade and cross-section shall conform to applicable Road Agency standard cross sections. In case of existing private roads, they shall conform to the roadway that existed prior to construction. The removal and disposal of existing materials necessary to fulfill the above requirements shall be considered incidental to the construction and the costs thereof shall be included in the items for which payment is provided.

C. Manhole rings, valve boxes and monument cases shall be adjusted as necessary to be flush with the restored surface.

D. The Contractor shall comply with all requirements of all permits for installation of pipelines in authorized right-of-way.

E. The Contractor will place and maintain sufficient and proper lights and barricades at all locations on roads not accepted by the Road Agency involved.

F. After completion of pipeline installation the Contractor shall clean up drainage ditches and restore all existing drainage structures that he may have damaged during the course of construction. He shall also comply with all drainage requirements of the agency involved upon which the agency's acceptance of the roads is conditioned.

G. The Contractor shall restore any private improvement on road right-of-way including, but not limited to, culverts, driveways, curbs, sidewalks, parking strips, parking areas, or other permanent improvements, whether or not a permit for such improvements has been obtained.

H. On streets where the pipeline is located on the shoulder alongside existing bituminous or concrete surfacing, no payment shall be made for cost of restoring street surfacing which may be damaged by the Contractor's operations. If the Engineer requires crushed rock spread on the shoulder it shall be paid under the crushed rock bid item.

I. All streets in the construction area as well as any unpaved streets used by Contractor's trucks or any other equipment hauling material to and from the area, whether within the construction area or adjacent thereto, and any unpaved streets used as detours during the construction shall be serviced with self-propelled pickup street sweepers to prevent the transport of sediment and other debris off the project site. Street sweepers shall be designed and operated to meet air quality standards

J. It is specifically understood and agreed that the Contractor is responsible for complying with all requirements of the Road Agency necessary to obtain written acceptance of the roads by the agency concerned, and for such work the Contractor will be paid only for the items included in this Contract.

K. Until accepted in writing by the Road Agency, the Contractor will maintain all roads in a condition satisfactory to the agency concerned. This shall include periodic

grading of all streets on which traffic is allowed wherever in the opinion of the Engineer, such grading is required. A suitable motor grader shall be available for this work.

L. Any settlement which occurs during the first year after final contract acceptance shall be repaired by the Contractor at his expense.

2. PRODUCTS

2.1 CRUSHED ROCK

A. Crushed rock shall be as specified in Section 02222.

2.2 ASPHALT CONCRETE PAVEMENT

A. Asphalt concrete pavement shall conform to the Technical Requirements of the state highway department in which the project is located for plant mix asphalt concrete unless otherwise set forth in the Special Provisions or if superseded by the local Road Agency.

2.3 ASPHALT TREATED BASE

A. Asphalt treated base shall conform to the Technical Requirements of the state highway department in which the project is located for asphalt treated base unless otherwise set forth in the Special Provisions or if superseded by the local Road Agency.

2.4 CONCRETE

A. Concrete specifications shall meet the requirements of the local Road Agency.

3. EXECUTION

3.1 GENERAL PAVEMENT REPAIR REQUIREMENTS

A. Pavement patching shall be scheduled to accommodate the demands of traffic and shall be performed as rapidly as possible to provide maximum safety and convenience to public travel.

B. The placing and compaction of the trench backfill, and the preparation and compaction of the subgrade shall be in accordance with the requirements of Section 02222 of these Specifications.

C. Prior to trench excavation in pavement surfaces, straight vertical trim lines shall be cut in order to minimize breakage and cracking of the remaining surfacing.

D. Before the patch is constructed all pavement cuts shall be trued so that the marginal lines of the patch will form a rectangle with straight edges and vertical faces.

E. After completion of the patches, the entire roadway surface shall be cleaned by brooming or such other methods as may be required. The early completion of this phase of the restoration is required, not only to facilitate public relations, control dust and traffic problems, but also to prevent the further break-up and cracking of the existing asphalt mat. If, in the opinion of the Engineer, the Contractor is not diligently pursuing the work in such a manner as to place the patch as soon as reasonably possible, the Contractor may be required to re-trim and remove any and all cracked areas in such a manner to produce a straight uniform edge.

F. Finished grade and cross section of patch shall match grade and cross-section of existing pavement.

G. All incidental work required to complete the patching of street surfaces as specified, including joints where required, shall be considered as incidental to the patching and the costs thereof shall be included in the items for which payment is provided.

3.2 ASPHALT CONCRETE PAVEMENT TRENCH PATCH

A. Preparation:

1. As soon after compacting the trench backfill and placing and compacting backfill material, where required, the Contractor shall place and compact crushed rock in the trench area to a minimum depth of four (4) inches or depth to match the original cross-section, whichever is greater.

2. A tack coat of asphalt applied at the rate of 0.02 to 0.08 gallon per square yard of retained asphalt shall be applied through the use of mechanical equipment to all surfaces on which any course of asphalt concrete is to be placed or abutted. The spreading equipment shall be capable of uniformly distributing asphalt materials over any area in controlled amounts and shall be equipped with hand operated spray equipment for use only on inaccessible and irregularly shaped areas.
3. The tack coat shall be a heated cutback asphalt, or emulsified asphalt, mixing grade. The emulsified asphalt may be mixed with water at the rate of 1 to 2 parts water to 1 part of emulsified asphalt.
4. If a temporary trench patch has been used it shall be removed and disposed of properly.

B. Two Lift Patch:
1. Immediately after completion of placing the base course, the Contractor shall place a two inch minimum compacted thickness of asphalt concrete surfacing.
2. A single lift of asphalt shall be at least 1 ½" thick and not more than 3 ½" thick.
3. The Contractor may substitute an equal amount of asphalt treated base for crushed rock and first lift of asphalt concrete.
4. When ordered by the District or when required in the Special Provisions, the Contractor shall begin the placement of the second lift. A tack coat shall be placed over the patch area. Asphalt concrete modified so that maximum size aggregate is 1/2 inch shall be placed over the tack coat. Prior to rolling, the aggregate in the asphalt concrete shall be hand raked back from the edges and rolled in such a manner to produce a uniform "feather" edge over the existing surface. The minimum compacted thickness of the second lift over the trench area shall be 1 ½".
5. Where excess settlement of the first patch occurs, a leveling course shall be used to prevent the thickness of the second lift from exceeding 2 ½" thickness.
6. The edge of the patch shall be sealed by painting with a cutback asphalt or CSS-1 emulsion and immediately covered with sand and heated.

C. Single Lift Patch:
1. Immediately after completion of placing the base the Contractor shall place a two-inch minimum thickness of asphalt concrete surfacing.
2. If the existing pavement is more than two inches the asphalt concrete shall be of the same depth as the existing pavement, depths greater than 3" shall require a Two Lift Patch as described in paragraph B above..
3. The edge shall be hand raked to produce a smooth edge where the patch abuts the existing pavement.
4. The thickness shall be adjusted so that a smooth uniform grade exists after rolling.
5. The edge of the patch shall be sealed by painting with a cutback asphalt or CSS-1 emulsion and immediately covered with sand and heated.

3.3 CEMENT CONCRETE PAVEMENT PATCH

A. After the subgrade for the pavement has been compacted and constructed to line and grade, the cement concrete pavement patch shall be placed, compacted and struck off to the grade of the adjacent pavement.
B. Minimum thickness shall be eight inches or the thickness of the existing pavement plus two inches, whichever is greater.
C. Through and dummy joints shall be placed and edged to match existing joints.
D. The surface shall be finished and brushed with a fiber brush.
E. Approved curing compound shall be placed on the finished concrete immediately after finishing.

3.4 RIGID TYPE PAVEMENT RESURFACED WITH ASPHALT CONCRETE

A. Cement concrete patch shall be placed as specified above for cement concrete pavement patch except that the surface of the cement concrete portion of the patch shall be left low enough to accommodate the asphalt portion of the patch. Brush finishing will not be required.
B. Curing shall be accomplished with an asphalt emulsion cut back with water.
C. Asphalt concrete or bituminous plant mix shall not be placed until the day after the cement concrete has been placed.
D. The edges of the existing asphalt pavements and castings shall be painted with hot asphalt cement or asphalt emulsion immediately before placing the asphalt patching material.
E. The asphalt concrete pavement shall then be placed leveled and compacted to conform to the adjacent paved surface.
F. All joints between the new and original asphalt pavement shall be painted with hot asphalt or asphalt emulsion and be covered with dry paving sand before the asphalt solidifies.

3.5 ASPHALT CONCRETE PAVEMENT

A. Full width asphalt concrete pavement shall conform to the Technical Requirements of the standard specifications of the State Highway Department in which the project is located.
B. After the subgrade has been properly prepared and compacted, a minimum of two inches of Hot Mix Asphalt shall be placed and compacted.
C. If the existing pavement is more than two inches thick, asphalt concrete shall be of the same depth as existing pavement prior to construction.
D. The edges of the existing asphalt pavements and castings shall be painted with hot asphalt cement or asphalt emulsion immediately before placing the asphalt patching material.
E. The asphalt concrete pavement shall then be placed, leveled, and compacted to conform to established cross-section and grade and to match adjacent paved surface.
F. The edge of the new pavement shall be sealed by painting with a cutback asphalt or CSS-1 emulsion and immediately covered with sand and heated.

3.6 ASPHALT CONCRETE OVERLAY

A. Before construction of an asphalt concrete pavement overlay on an existing surface, all fatty asphalt patches, grease drippings, and other objectionable matter shall be removed from the existing pavement. Excess asphalt joint filler shall be removed and pre-molded joint filler shall be removed to at least ½ inch below the surface of the existing pavement. Existing pavement or bituminous surfaces shall be thoroughly cleaned by sweeping to remove dust and other foreign matter.
B. Prior to placing asphalt concrete, a tack coat shall be applied using heated cut back asphalt or emulsified asphalt at the rate of 0.02 to 0.05 gallons per square yard.
C. When the surface of the existing pavement or old base is irregular, it shall be brought to uniform grade and cross section as required by the Road Agency involved. Pre-leveling of uneven or broken surfaces over which asphalt concrete is to be placed is required and may be accomplished by the use of asphalt concrete placed with a motor patrol grader, a paving machine, by hand raking, or by a combination of these methods. After placement, the asphalt concrete used for pre-leveling shall be compacted with rollers.
D. When asphalt concrete pavement is to be constructed over an existing paved or oiled surface, in addition to the preparation as outlined hereinbefore, all holes and small depressions shall be filled with an appropriate class of asphalt concrete mix.

The surface of the patched area shall be leveled and compacted thoroughly. All previous patches that have settled shall be pre-leveled so that depth of overlay does not exceed two inches in thickness.

E. After preparation of the base a one inch minimum compacted full width layer of asphalt concrete shall be placed on top of an existing paving surface. Surfacing shall be placed in such a manner as to prevent disturbing existing drainage. Surfacing shall be feathered out as required to meet existing driveways, catch basins, traffic control pads, street intersections, etc., and shall include thickened edge paving where it is now existing.

F. The edges of the overlay shall be sealed by painting with a cutback asphalt or CSS-1 emulsion and immediately covered with dry sand and heated.

3.7 BITUMINOUS SURFACE TREATMENT REPLACEMENT

A. Unless otherwise specified, all light bituminous surface treatment shall be replaced with a one inch asphalt concrete overlay over a crushed rock base.

B. Base shall consist of four inches of crushed rock.

3.8 CRUSHED ROCK

A. Existing crushed rock shall be replaced with new material.

B. Thickness of course shall be as directed by the District.

C. When the utility line is along the shoulder of a roadway, the Contractor may be directed to place a course of crushed rock along shoulder of the roadway. Thickness shall be as required by the Road Agency.

D. During dry periods, the Engineer may require water sprinkling prior to and during the placement of crushed rock. The cost of such sprinkling shall be included in the unit bid for crushed rock.

3.9 TEMPORARY TRENCH PATCH

A. The Contractor may be required to furnish and install a temporary trench patch only when specifically directed by the District or as provided on the Plans.

B. Area to be patched shall be cleaned out and graded to the bottom of the base course. Any loose asphalt shall be removed.

C. Place a patch consisting of 2-inch minimum course of crushed rock base and a 2-inch minimum course of cold asphalt plant mix placed over the trench area.

D. Both the base and surface course shall be placed and compacted so that the finished surface will match the grade and cross-section of the existing pavement.

E. Surface of pavement shall be cleaned of all dirt and debris before opening to traffic.

F. The Contractor shall maintain temporary patch until the permanent patch is installed.

3.10 CEMENT CONCRETE CURBS AND GUTTERS

A. The concrete in the curbs and gutters shall be air entrained concrete in accordance with the requirements of the WDSOT Standard Specifications for Road Bridge and Municipal Construction Section8-14 (current edition).

B. Side forms shall rest throughout their length on firm ground and shall be full depth of the curb. They shall be either metal of suitable gauge for the work or surfaced "construction" grade lumber not less than two (2) inches (commercial) in thickness. Forms shall be cleaned and well oiled prior to use. Forms used more than one time shall be cleaned thoroughly and any forms which have become worn, splintered, or warped shall not be used again. Forms shall be adequately supported to prevent deflection or movement.

C. The foundation shall be watered thoroughly before the concrete is placed.

D. Concrete shall be well tamped and spaded or vibrated in the forms.

E. Exposed surfaces shall be finished full width with a trowel and edger. Remove forms of all roadway face of curbs within 24 hours or placement of concrete and treat with a float finish. The curb and gutter finish shall meet the Road Agency requirements.

F. Joints shall be spaced to match joints in the abutting pavement. If the abutting pavement is not jointed or the curb or gutter is not abutting pavement, joints in the curb and gutter shall be spaced at 15 foot intervals. These joints shall be 1/8 inch minimum thickness and constructed to a minimum depth of 1 inch by sawing or scoring with a tool which leaves the corners rounded and destroys aggregate interlock to a depth specified. Expansion joints, filled to full cross-section with filler 1/4 inch thick shall be placed in the curb and gutter to match joints in the abutting pavement, at structures, curb returns and where shown in the plans.
G. Cure for 72 hours.
H. Curb and gutter may be constructed by the use of slip form equipment provided the completed curb or gutter retains its shape, grade, and line. Finishing, joints, and curing shall be as provided above.
I. Top of the form shall not depart from grade more than 1/8 inch when checked with a 10 foot straight edge. Alignment shall not vary more than 1/4 inch in 10 feet.

3.11 ASPHALT CONCRETE CURBS AND GUTTERS

A. Placed, shaped and compacted true to line and grade, with machine capable of shaping and compacting the materials, to the required cross-section.
B. Provide tack coat of asphalt applied to the surface upon which asphalt concrete curb is to be placed immediately prior to placing of curb.

3.12 CEMENT CONCRETE SIDEWALKS

A. The concrete in the sidewalks shall be air entrained concrete in accordance with the requirements of the WDSOT Standard Specifications for Road Bridge and Municipal Construction Section 8-14 (current edition).
B. Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.
C. The foundation shall be brought to the grade required and well wetted before placing the concrete.
D. Place concrete in the forms and strike off with a heavy iron shod straight edge, trowel surface smooth with a steel trowel as soon as surface can be worked. After troweling and before jointing or edging, the surface of the walk shall be lightly brushed in a transverse direction with a soft brush. On grades of over 4%, the surface shall be finished with a stipple brush.
E. Joints shall be constructed at the locations and of the sizes as required by the Road Agency.
F. Cured for at least 72 hours by means of moist burlap or quilted blankets. Exclude all traffic, both pedestrian and vehicular, during curing period.

3.13 PAVEMENT MARKINGS

A. The Contractor shall restore any and all pavement striping and traffic buttons damaged during construction under this Contract.
B. Restoration shall be in accordance with the current standards of the Road Agency involved.
C. Cost of restoration of pavement striping and traffic buttons shall be incidental to pavement restoration.

3.14 ADJUSTING MANHOLES TO GRADE

A. The Contractor shall adjust manhole castings to final grade by adding concrete rings and/or mortar under the casting and patching with asphalt concrete. Paving adjusting rings will not be used unless specifically authorized by the road agency.
B. The Contractor shall exercise extreme care in preventing foreign material from entering the manhole.

C. All manholes shall be adjusted to grade after the asphalt concrete surfacing has been placed. Disturbed area around cover shall be patched and sealed to the satisfaction of the Road Agency having jurisdiction.
D. The Contractor shall take care not to extend the manholes above finished grade.
E. In concrete pavement areas, castings shall be adjusted to grade prior to concrete placement.

3.15 ADJUSTING MONUMENT CASES AND VALVE BOXES TO GRADE

A. Monument cases and/or valve boxes shall be adjusted to final grade and patched with asphalt concrete or cement concrete to match the roadway material and as designated by the Road Agency.
B. Adjustment shall be made after the resurfacing.
C. Patching around monument cases and/or valve boxes shall be done to the satisfaction of the Road Agency having jurisdiction.
D. Valve boxes shall be adjusted to the satisfaction of the utility having jurisdiction.
E. The Contractor shall take care not to extend the monument cases and/or valve boxes above the finished grade.
F. In concrete pavement areas, castings shall be adjusted to grade prior to concrete placement.

* * * END OF SECTION * * *

SECTION 02605
MANHOLES AND CLEANOUTS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Shoring: Section 02150
C. Excavating, Backfilling and Compacting for Utilities: Section 02222
D. Sanitary Sewer: Section 02730

1.2 QUALITY ASSURANCE

A. Testing By Manufacturer:
   1. Manufacturer shall test all material as required by these Specifications and the Standards referenced.
   2. Manufacturer shall submit to the Engineer two (2) copies of all test results which shall include a certification that materials to be delivered are represented by the samples tested and that such delivered materials meets or exceeds the specification requirements.
   3. No material shall be delivered until test results and certifications are in the possession of the Engineer.
   4. The Engineer shall have free access to all testing and records pertaining to materials to be delivered to the job site.
   5. The Engineer may elect to be present at any or all material testing operations.

2. PRODUCTS

2.1 PRECAST MANHOLES

A. Precast concrete manholes shall conform to the requirements of ASTM C478 except as specifically modified herein.
B. Joints between precast elements used for sanitary sewers shall be tongue and groove designed to accommodate a rubber gasket joint similar to pipe joints conforming to ASTM C443. Design of joints shall be approved by the Engineer before manufacture. Shop drawings shall be submitted for review. Variations in joint dimensions shall meet the gasket design requirements but shall in no case be more than the minimum requirement of ASTM C478.
C. The exterior joints between manhole sections shall also be grouted with cement mortar.
D. Base sections shall be made with the base slab integral with the wall in such a manner to achieve a completely watertight structure. Design of base shall be in accordance with the following table for all manholes up to 25 feet deep using Grade 60 reinforcing steel.

Manhole Inside Diameter	Minimum Base Thickness	Minimum Steel-Sq.In/LF Both Directions	
		Separate Base	Base Integral With Wall
48"	6"	0.23	0.15
54"	8"	0.19	0.19
72"	8"	0.35	0.24
96"	12"	0.39	0.29

E. Proportion of Portland cement in concrete mixture shall be not less than 564 pounds per cubic yard of concrete.
F. Openings to receive pipes shall be core drilled and circular, and shall be sized as required for the specified pipe entry coupling.
G. The manufacturer may produce each manhole riser and base in one section if

approved by the Engineer.

H. Cones with diameter at small end of 36 inches shall be not less than 24 inches in height. Cones with a diameter at the small end of 24 inches shall be not less than 17 inches in height.

I. The openings in the top slab shall be eccentrically located so as to provide at least 6 inches minimum radial distance from the edge of the opening to the outer edge of the slab but not more than 2.5 inch off-set distance from the edge of the opening to the inside face of the standard section.

J. Unless otherwise provided, steps shall be installed in each section so that sections placed together in any combination will provide a continuous vertical ladder.

2.2 MANHOLE PIPE ENTRY COUPLINGS

A. All pipe connections to new and existing manholes shall be accomplished by installation of a flexible pipe-to-manhole connector which shall provide a watertight joint between both the pipe and connector and the connector and manhole.

B. The connector shall be a “Kor-N-Seal” with “Wedge Korband” (Type I or II as required for pipe diameter) as manufactured by NPC Inc. of Milford, New Hampshire. Connectors from other manufacturers shall not be acceptable.

C. At connections to existing manholes, the above specified Kor-N-Seal connectors shall be used. The existing manhole shall be core drilled as necessary to accommodate the connector. If, in the opinion of the District, core drilling of an existing manhole is not possible, PVC pipe entry couplings may be used in place of the Kor-N-Seal connector. At connections where the use of PVC couplings is authorized, a PVC pipe entry coupling shall be grouted in place in the wall of the existing manhole. The coupling’s exterior surface shall be sand-impregnated epoxy to insure adhesion between the grout and PVC. The final connection shall be watertight. Pipe entry couplings shall be as manufactured by GPK, or approved equal.

2.3 DROP MANHOLES

A. Drop manholes shall be an inside drop or outside drop as specified and constructed in accordance with the Standard Details.

B. One length of ductile iron pipe shall be provided outside the manhole, to reach original solid bearing ground.

C. An outside drop manhole shall be fabricated with the drop outside the manhole section as shown on the details.

D. An inside drop shall be fabricated with polyvinyl chloride pipe as shown on the details.

2.4 MANHOLE STEPS AND LADDER

A. Conform to applicable requirements of ASTM C478 and as shown on the details.

B. Conform to OSHA or WISHA requirements, whichever is more stringent.

C. Designed so that foot cannot slide off the ends.

D. Vertical spacing at 12 inches.

E. Project uniformly inside wall.

F. Be deformed bar conforming to ASTM A615, intermediate or standard grade, hot bent and galvanized after bending. For bending, the temperature shall be at least 1600^{O}F. Galvanizing shall conform to ASTM A123. As an alternative, steps may be steel reinforced polypropylene. The reinforcement shall be ½ inch Grade 60 deformed reinforcing bar per ASTM A-615. Polypropylene shall conform to ASTM D-4101.

G. Design utilizing other materials or shapes that conform to the requirements of this specification may be used upon written approval of the Engineer.

H. Step dimensions and pattern shall conform to the details.

I. Ladders: Base sections of precast manholes may be provided with a ladder made of aluminum or steel galvanized after fabrication, as shown on the Standard Details. Ladder shall be adjusted so that it is in line with manhole steps above and extends out the same distance from the wall as the steps above. Ladder shall be securely imbedded and grouted into channel shelf. As an alternative, ladder may be steel reinforced polypropylene. Ladder rungs shall be reinforced with 1/2 inch Grade 60 reinforcing bar per ASTM A-615. Ladder rails shall be reinforced with 9/16 inch cold drawn bar per ASTM C-1018. Polypropylene shall conform with ASTM D-4101.

2.5 CAST METAL FRAMES AND COVERS

A. Conform to Manhole Frame and Cover Detail

B. Frames shall be gray-iron conforming to the requirements of AASHTO M105 (ASTM A48), Grade 30B. Covers shall be ductile iron conforming to ASTM A536, Grade 80-55-06.

C. Be free of porosity, shrink cavities, cold shuts, or cracks or any surface defects which would impair serviceability.

D. Repair of defects by welding or by the use of "smooth-on" or similar material will not be permitted.

E. Manufacturer shall certify that the product conforms to the requirements of these specifications.

F. Apply a bituminous coating to all surfaces. The finished coating shall be continuous, smooth, neither brittle when cold nor sticky when exposed to the sun, and shall be strongly adhered to the casting.

G. The District shall have the right to require inspection and approval of all castings prior to painting.

H. Machine finish the horizontal seating surface and inside vertical recessed face of the frame, and the horizontal seating surface and vertical outside edge of the cover to the following tolerances.

1. Frame +3/32 inch to -3/32 inch. Cover +3/32 inch to -3/32 inch.
2. Cover shall not rock when it is seated in any position in its frame.
3. There shall be not more than 3/16 of an inch side play in any direction between the cover and the frame when any cover is placed in any position in its frame. All covers shall be interchangeable within the dimensions shown on the details.

I. All frames and covers shall be identified by the name or symbol of the manufacturer in a plainly visible location when the frame and cover is installed. In addition to the manufacturer's identification, when ductile iron is furnished, the material shall be identified by the notation "DUC" or "DI". The manufacturer's identification and the material identification shall be adjacent to each other and shall be minimum 1/2-inch to maximum 1-inch high letters recessed to be flush with the adjacent surfaces.

J. Cover shall have type of service indicated on cover with two inch raised letters such as WATER, SEWER OR DRAIN.

K. Cover shall be the bolt-down type with separate provision for lifting/removal per detail.

2.6 CLEANOUT FRAMES AND COVERS

A. Conform to Sewer Cleanout Detail

2.7 MANHOLE COLLAR

A. Manhole collar shall be constructed of concrete with 3,000 psi concrete prepared from ASTM C150 Type I or II Portland cement.

B. Collar shall extend vertically from grade (top of cover elevation) to bottom of highest adjustment ring. Collar shall extend a minimum of 12 inches measured radially beyond the manhole cover frame.

2.8 MANHOLE EXTERNAL SEALING BANDS AND PLUGS

A. All manhole, riser, adjusting rings and frame-to-concrete joints and voids (including lifting holes) shall be externally sealed with a rubber seal as specified below.
B. The external manhole seal extending from manhole frame continuously to manhole cone section shall be the external manhole seal (continuous, multi-suction bands) system, as manufactured by Inti-shield of Shoreview, Minnesota or the Wrapid-Seal system as manufactured by Canusa of Woodlands, Texas.
C. Manhole riser and cone joints and lift holes shall be sealed with the Wrapid-Seal system as manufactured by Canusa of Woodlands, Texas.
D. Plastic body, rubber-gasketed mechanical pipe plugs shall be provided and installed in each preformed manhole lift hole.

3. EXECUTION

3.1 MANHOLE INSTALLATION

A. Manholes shall be constructed of precast units.
B. Foundations:
   1. Adequate foundations for all manhole structures shall be obtained by removal and replacement of unsuitable material with well graded granular material, or by tightening with coarse ballast rock, or by such other means as provided for foundation preparation of the connected sewers.
   2. Place base on gravel on a well-graded granular bedding course conforming to the requirements for sewer bedding, not less than 4 inches in thickness and extending either to the limits of the excavation or to a minimum of 12-inches outside the limits of the base section. In the latter case, the balance of the excavated area shall be filled with select material, well tamped to the level of the top of the bedding to positively prevent any lateral movement of the bedding when the weight of the manhole is placed upon it.
   3. Bedding course shall be firmly tamped and made smooth and level to assure uniform contact and support of the precast elements.
C. Precast Base Section:
   1. Place on the prepared bedding so as to be fully and uniformly supported in true alignment.
   2. Make sure that all entering pipes can be inserted on proper grade and directed at the horizontal center of the manhole.
D. Precast Sections:
   1. Placed and aligned to provide vertical sides and vertical alignment of the ladder rungs.
   2. The completed manhole shall be true to dimensions, and watertight.
   3. Lift holes and manhole joints shall be thoroughly wetted and then be completely filled with mortar, smoothed and pointed both inside and out to ensure water tightness.
   4. Steel loops must be removed and the remaining void shall be covered with mortar, smoothed and pointed.
   5. Manhole joints shall be sealed by a rubber gasket as specified above, an external rubber seal and internal grout. The external rubber seal shall be installed in conformance with the seal manufacturer’s recommendations. Heating of the concrete wall or other measures shall be used as necessary and appropriate to insure a good seal and adherence of the seal material to the wall. The interior manhole joints shall be thoroughly wetted and then be completely filled and covered with mortar, mounded away from the manhole wall, as indicated on the standard detail.
E. Pipe Connections:

1. Provide flexible joint at a distance from the face of the manhole of not more than 1-1/2 times the nominal pipe diameter or 12 inches, whichever is greater, for all rigid pipes entering or leaving any manhole.
2. No flexible joint shall be placed within 10 feet of the manhole wall, when flexible pipe is used.
3. Firmly compact bedding under pipe within the area of the manhole excavation.
4. All pipes entering/leaving manholes shall be aligned with the center of the manhole unless authorized by the District.
5. Provide a watertight joint where flexible PVC pipe enters the manhole wall by utilizing a manhole entry coupling that is mortared into the wall. Where resilient connectors are used, the Contractor shall extend the channel into the connector to insure pipe support and a watertight joint. Resilient connectors shall be installed in accordance with the manufacturer's requirements.

F. Channels:
1. May be precast or constructed in field.
2. Conform accurately to the sewer grade and bring together smoothly with well rounded junctions.
3. Channel sides shall be carried up vertically to the crown elevation of the various pipes.
4. Shelf between channels shall be constructed with concrete and smoothly finished and warped evenly with slopes to drain.

G. Manhole Cover:
1. Final elevation and tilt of cover shall conform to the restored street surface unless otherwise specified.
2. Warping of surfacing to meet grade of castings will not be allowed.
3. Provide not less than 4 inches or more than 16 inches of grade rings between the top of the cone or slab and the underside of the manhole frame for adjustment of the frame to street grade or ground surface.
4. Both inside and outside of the grade rings shall have a smooth uniform mortar finish to ensure a watertight seal.

H. Backfill:
1. Extend around manhole and at least one pipe length into each trench.
2. Hand place and tamp gravel bedding up to an elevation of six inches above the crown of all entering pipes.

I. Manhole Collar:
1. Contractor shall install a concrete collar of sufficient size around the neck and frame to hold assembly in place at locations as indicated on the plans and as directed by the District.

3.2 CONNECTIONS TO EXISTING MANHOLES

A. The Contractor shall verify the existing manhole invert elevations prior to construction.
B. Excavate completely around the existing manhole to ensure against unbalanced loading on the manhole.
C. Keep the manhole in operation at all times and take precautions necessary to prevent any debris or other materials from entering the sewer.
D. Contractor may be required to install a tight pipeline bypass through the existing channel. If the connection is to a dead end manhole, the outlet shall be plugged watertight with a metal mechanical screw type plug. Plug shall be secured to the ladder with a rope or chain.
E. Bring laterals into the existing manhole so that the crowns of the two incoming pipes are at the same elevation unless otherwise specified.

F. Reshape the existing base to provide a channel equivalent to that specified for a new manhole.
G. The Contractor shall be responsible for repairing all damage to the manholes resulting from his operations.

3.3 CLEANOUTS

A. Sewer cleanouts shall be constructed as shown on the standard plan.
B. All materials incorporated into the cleanout structure shall meet the requirements of the various applicable sections of these specifications.
C. Pipe joints shall be the type specified for sewer pipe used.
D. The trench excavation shall be made in such a manner as to provide an undisturbed base upon which the pipe shall be placed.
E. Bedding around and under the pipe shall be tamped.

* * * END OF SECTION * * *

SECTION 02610
PIPE AND FITTINGS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Excavating, Backfilling and Compacting for Utilities: Section 02222
C. Water Lines: Section 02660
D. Sanitary Sewers: Section 02730
E. Sewer Force Mains: Section 02732

1.2 QUALITY ASSURANCE

A. Testing by Manufacturer:
   1. Manufacturer shall test all materials as required by these Specifications and the standards referenced.
   2. Manufacturer shall submit to the Engineer two (2) copies of all test results which shall include a certification that materials to be delivered are represented by the samples tested and that such delivered materials meet or exceed the specification requirements.
   3. No material shall be delivered until test results and certifications are in the possession of the Engineer.
   4. Engineer shall have free access to all testing and records pertaining to material to be delivered to the job site.
   5. The Engineer may elect to be present at any or all material testing operations.

B. Joint tests are intended for qualification of joint design and shall be considered to be a qualification test to establish the adequacy of the manufacturer's joint design. The manufacturer shall certify that tests have been performed within the last year with pipes equivalent in size and design and that they have passed the test enumerated in the specifications. Tests may be waived for pipes of different strength class if joint design is the same as the pipe tested.

C. Qualifications:
   1. HDPE pipe jointing shall be performed by personnel trained in the use of thermal butt-fusion or sidewall fusion equipment. Personnel directly involved with installing HDPE pipe shall receive training in the proper methods for handling and installing the HDPE pipe.
   2. Each thermal butt-fusion or sidewall fusion machine operator shall demonstrate his ability prior to insertion operations by fusing two pieces of pipe together in the presence of the Engineer. A fused joint with a minimum of 6 inches of pipe on either side shall be furnished to the Engineer for testing as the District may elect. The cost for any testing of the joint shall borne by the District.

1.3 SUBMITTALS

A. The Contractor shall submit the following to the District within ten calendar days of the award date of the contract, or as otherwise noted:
   1. Manufacturer certification that all furnished material is manufactured, sampled, tested and inspected in accordance with these specifications. An authorized agent of the manufacturer shall sign the certification.
   2. Manufacturer’s literature for all pipe, fittings, couplings, adapters, and other materials to be furnished for the project.
   3. Fusion machine operators shall have attended and successfully completed a training course sponsored by the pipe manufacturer. A written copy of such training certification shall be provided to the Engineer with the installation plan and schedule.

2. PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE (HDPE) PIPE/FITTINGS

A. All pipe/fitting sizes shown on plans are iron pipe size diameters unless otherwise indicated.
B. Unless otherwise specified, all HDPE pipe/fittings shall have a minimum standard dimension ratio (SDR) of 17.
C. HDPE pipe/fittings shall be co-extruded from PE 3608 or PE 4710 virgin resins meeting the specifications as defined in ASTM D3350. Pipe shall be manufactured in accordance with AWWA C906 and ASTM F714.
D. HDPE pipe/fitting material shall be high-density, extra-high molecular weight polyethylene pipe conforming to ASTM D3350 with a cell classification of 345464C.
E. Additives may be used provided pipe/fittings still meet the requirements of ASTM D2837.
F. Pipe/fittings shall contain no recycled compound except that generated within the manufacturer's own plant from resin meeting the same specifications from the same raw material supplier.
G. Pipe/fittings shall be manufactured in accordance with AWWA C906 and ASTM F714. Lettering shall be legible and permanent under normal conditions of handling and storage. Pipe/fittings shall be clearly and frequently marked with the following information:
    1. Name/trademark of pipe manufacturer.
    2. Nominal pipe size.
    3. Standard Dimension Ratio (SDR).
    4. PE 3608 or PE 4710.
    5. Manufacturing standard reference.
    6. Production code from which date and location of production can be determined.
    7. Nominal pressure.
    8. Raw material.
H. Gasketed electrofusion HDPE sewer saddles shall be per ASTM F1055 for use with pipe conforming to ASTM D2513/3035, F714 and with butt fittings conforming with ASTM D3261 as applicable. Saddles shall be produced with PE 3608 or PE 4710 grade polyethylene resin which complies with ASTM D3350.

2.2 DUCTILE IRON PIPE

A. For underground pressure pipelines (water main and sewer force main), conform to AWWA C150/C151 and shall be Pressure Class 350, unless otherwise specified. For above grade pressure pipelines (pump stations), conform to AWWA C150/C151 and shall be thickness Class 53, unless otherwise specified. For gravity pipelines, conform to ASTM A746 and shall be thickness Class 50, unless otherwise specified.
B. Joints shall be mechanical joint or push-on joint and shall conform to AWWA C111 (ANSI A21.11).
C. Pipe and fittings shall have a cement mortar lining conforming to AWWA C104 (ANSI A21.4).
D. All ductile iron pipe located underground shall be polyethylene encased in accordance with AWWA C105.

2.3 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (UNDER 4 INCHES)

A. Conform to ASTM D2241.
B. Pipe material shall be PVC 1120, PVC 1220 or PVC 2120.
C. Minimum wall thickness shall be equal or greater than a standard dimension ratio (SDR) of 21 unless otherwise specified.
D. Pipe shall bear the National Sanitation Foundation Seal for use to transport potable water.
E. Joints shall conform to ASTM D3139 using a restrained rubber gasket conforming to ASTM F477.

F. Pipe shall be installed with detectable locator tape.

2.4 DUCTILE IRON AND GRAY IRON FITTINGS

A. Use for ductile iron or PVC pipe.
B. Conform to AWWA C110 (ANSI A21.10) or AWWA C153 (ANSI 1921.53) as indicated.
C. Joint shall conform to AWWA C111 (ANSI A21.11).
D. Dimensions of fittings and design of bell may be modified to conform with the pipe being used.
E. Cement mortar lining conforming to AWWA C104 (ANSI A21.4).
F. Gaskets for flat faced or raised faced flanges shall be 1/8-inch thick neoprene having a durometer of 60 plus or minus 5.
G. Gaskets for flanges having a recess machined to receive an "O" ring shall be neoprene and shall have the dimensions and durometer as recommended for the particular service application by the flange manufacturer.
H. Provide type, material and identification mark for bolts and nuts.
I. Fittings for sewer force main shall have stainless steel nuts and bolts.

2.5 FLEXIBLE COUPLINGS

A. Use for connection between plain end pipe of same or different material.
B. Sleeve: Gray iron ASTM A126 Class B or ductile iron ASTM A536. Ends have a smooth inside taper for uniform gasket seating.
C. Followers: Ductile iron ASTM A536.
D. Gaskets: Grade 30 specially compounded rubber of all new materials.
E. Bolts and nuts: High strength low alloy steel with heavy, semi-finished hexagon nuts to AWWA C111 (ANSI-A21.11). Bolts and nuts shall be stainless steel for sewer force main couplings.

2.6 WATER SERVICE PIPE

A. Copper Tubing:
   1. Copper tubing shall conform to the requirements of ASTM B88, Type K, annealed.Use for connection between plain end pipe of same or different material.
   2. The tubing shall be coupled using flare-type compression fittings, conforming to the requirements of AWWA C800, minimum 150 psi working pressure.
B. Polyethylene Pipe:
   1. Polyethylene Pipe to be used for water service lines 2 inches in size and smaller shall conform to the requirements of AWWA C901 Class 160 psi manufactured with PE 3608 or PE 4710 material.
   2. Bear the seal of the National Sanitation Foundation for potable water pipe.
   3. Joints shall be made in accordance with the manufacturer's recommendations. Solvent welded pipe joints will not be permitted.
C. Polybutalene Pipe:
   1. Polybutalene pipe to be used for water service lines 2 inches in size and smaller shall conform to the requirements of AWWA C902 Class 160 psi.
   2. Bear the seal of the National Sanitation Foundation for potable water pipe.
   3. Joints shall be made in accordance with the manufacturer's recommendations. Solvent welded pipe joints will not be permitted.
D. Insulating Couplings:
   1. Insulating couplings shall be required at any point of connection of two dissimilar metallic pipes (i.e., copper to galvanized iron or steel).

2.7 WATER SERVICE MATERIALS

A. Saddles:
   1. Saddles for four-inch water lines and larger shall be bronze with double bronze straps with standard tapping to match service requirements.

2. Saddles for two-inch water lines shall be brass saddles with bronze bolt and hinge pin.

B. Corporation Stops:
1. Conform to AWWA C800.
2. Corporation stops for use with saddles shall be or bronze alloy with inlet I.P. standard thread and outlet thread compatible with connection piping with no special adapters.
3. Corporation stops for direct tapping shall be bronze alloy with AWWA tapered thread inlet and outlet thread compatible with connecting pipe without special adapters.

C. Meter Setters:
1. Meter setters shall be copper with locking meter stop and dual check valve: Ford VBHC72-12W-11-33 DP x DP, or approved equal.

2.8 POLYVINYL CHLORIDE (PVC) SEWER PIPE

A. Conform to ASTM D3034, SDR 35, or ASTM F789.
B. Joints shall conform to ASTM D3212 using a restrained rubber gasket conforming to ASTM F477.
C. Fittings shall be injection molded tees or factory solvent welded saddle tees. Fittings for transition from HDPE to PVC shall include restrained rubber gasket and shall be specifically fabricated for watertight joints for the type of pipes to be joined. Saddles fastened to pipe with external bands are not acceptable on any new system, unless specifically approved by the Engineer.
D. All PVC sewer pipe shall be considered flexible conduit.
E. Size of PVC sewer pipe shall not exceed 12 inches.

2.9 TEE FITTINGS FOR SEWERS

A. Unless otherwise specified, all tee connections shall be 6 inches inside diameter and shall be factory made.
B. All fittings shall be the same material as the pipe, unless otherwise specified. Cast iron fittings may be used for ductile iron pipe.
C. Fittings shall have sufficient strength to withstand handling and load stresses normally encountered.
D. All fittings shall be sealed with plugs of same material as the pipe and gasketed with the same gasket material as the pipe joint.

2.10 RESTRAINED COUPLINGS

A. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10.
B. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.
C. The flange adapters shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow a minimum 0.6” gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
D. For Ductile Iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.
E. The flange adapter shall be the SERIES 2100 MEGAFLANGE adapter as produced by EBAA Iron, Inc., or approved equal.

2.11 POLYETHYLENE ENCASING

A. Polyethylene film shall be manufactured of virgin polyethylene material confirming to the requirements of ASTM D1248 Polyethylene Plastics Molding and Extrusion Materials.
B. Polyethylene film shall have a minimum nominal thickness of 0.008 m (8 mils). The minus tolerance of thickness shall not exceed 10 percent of the nominal thickness.
C. Tube size for each pipe diameter shall be as listed below:

Nominal Pipe Diameter	Flat Tube Width
3	14
4	16
6	20
8	24
10	27
12	30
14	34
16	37
18	41
20	45
24	54
30	67

2.12 DETECTABLE LOCATOR TAPE

A. The tape shall consist of a minimum 4.0 mil thickness, inert polyethylene plastic which is impervious to all known alkalis, acids, chemical reagents and solvents likely to be encountered in the soil, with a minimum 1/3-mil metallic foil. The tape shall be at least three inches (3") in width and shall be solid blue with identifying print in black letters. The tape shall have printed thereon the following or similar as commercially available:

"CAUTION - BURIED WATERLINE BELOW"
or
"CAUTION - BURIED SEWER LINE BELOW"
as appropriate.

The identifying lettering shall be minimum 1" high and repeated continuously the full length of the tap. In no instance shall the spacing of the individual segment of the identifying message be greater than eighteen inches (18").

B. Detectable locator tape shall be installed 18 inches above the pipe it identifies. The backfill shall be sufficiently leveled so that the tape will be installed on a flat surface. The tape shall be centered in the trench and laid flat with printed side up. Caution shall be exercised to avoid displacement of tape and to ensure its integrity. The remainder of the trench is then backfilled in accordance with applicable specifications.

C. In addition to the detectable locator tape specified above, a #12 stranded, insulated copper wire shall be installed at the outside top of pipes where indicated on the drawings and details for the entire length of the pipe regardless of pipe material. The tracer wire shall be attached to the pipe as necessary to insure that it remains at the top of the pipe during trench backfill. The tracer wire shall be terminated as indicated on the drawings or as directed by the District.

D. Pipeline markers shall be of a composite material manufactured from glass-fiber reinforced polymers, as manufactured by Carsonite International (Carson City, Nevada), or approved equal. All markers shall be 72” long. All markers shall have a “call before you dig” decal, and all markers shall be installed at the locations indicated on the drawings or as directed by the District. Water line markers shall be Carsonite Utility Marker (WM-375), blue with decal reading “CAUTION – WATER PIPELINE.” Sewer line markers shall be Carsonite Service Marker with Tracer Wire, green (white if green is not available) with decal reading “CAUTION – SEWER PIPELINE,” with 20 feet of tracer wire in addition to that within the marker.

3. EXECUTION

3.1 INSTALLATION

A. Install pipe in accordance with specification section for pipeline being installed.

3.2 FUSION JOINING HDPE

A. All HDPE pipe shall be joined by thermal butt-fusion or sidewall fusion per manufacturer's recommendations and ASTM D2657. The pipe manufacturer shall submit a certificate of compliance stating that the proposed fusing equipment is in compliance with their requirements.
B. Contractor shall identify means of joining one pipe to another and details for installation prior to beginning work. Joining and installation details shall be subject to the District's approval. Threaded or solvent–cement joints and connections are not permitted.
C. Joints shall have weld strength equal to or greater than the tensile strength of the pipe/fittings. All joints shall have sufficient strength to withstand handling and load stresses normally encountered during and following installation of the pipe.
D. HDPE pipe/fittings shall be joined into continuous lengths above grade on site whenever possible. Pipe shall be joined on site in appropriate working lengths near the insertion pit. HDPE pipe shall be assembled and stored where accesses to homes, businesses, mailboxes, etc. are not disrupted.
E. Contractor shall pre-assemble as much pipe as possible before beginning insertion process. If additional pipe is needed, pipe shall be joined as it is being inserted.
F. Pipe lengths shall be stored in a manner and location as to protect the pipe from scouring, gouging, or other damage. Internal scouring and external cuts or abrasion deeper than 10% of the wall thickness or pipe sections found to be out of round shall not be used as replacement pipe.
G. The joints shall be leak proof, thermal, butt-fused joints. All fusing shall be done using tools recommended by the pipe supplier and approved by the District. Operators shall be certified by the pipe manufacturer. The fusing machine shall have hydraulic pressure control for fusing two pipe ends together. The ends of pipe shall be trimmed to form perpendicular faces prior to fusing. The heating plate on the fusing machine shall be electrically heated and thermostatically controlled and shall contain a temperature gauge for monitoring temperature. The heating plate shall be subject to periodic inspection, using a temperature stick, to assure even heating.
H. Joints between pipe sections shall be smooth on the inside. Internal projection beads shall be removed from each pipe joint prior to installation of the pipe. Joints between pipe sections shall not exhibit internal beads that protrude into the pipe more than ¼-inch. The bead remnants shall be removed from the pipe prior to installation and disposed of.
I. Two joints, selected at random by the District from the first total of 1,000 feet shall be tested in compliance with ASTM D638 to ensure that the tensile strength of yield of the butt fusion joints equals or exceeds that of the pipe. The test specimen shall be obtained by cutting the liner pipe at least twelve inches on each side of the field made joint. One additional test shall be made for each additional 1,000 feet of line or portion thereof.
J. The butt-fused joint shall provide true alignment between the joined pipes and shall have uniform roll back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be inspected prior to insertion and shall be subject to acceptance by the District. All defective joints shall be cut out and replaced at no cost to the District.

* * * END OF SECTION * * *

SECTION 02640
VALVES

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Excavating, Backfilling and Compacting for Utilities: Section 02222
C. Pipe and Fittings: Section 02610

1.2 QUALITY ASSURANCE

A. Testing by Manufacturer:
   1. Manufacturer shall test all materials as required by these specifications and the standards referenced.
   2. Manufacturer shall submit to the Engineer two (2) copies of all test results which shall include a certification that materials to be delivered are represented by the samples tested and that such delivered materials meet or exceed the specification requirements.
   3. No materials shall be delivered until test results and certifications are in the hands of the Engineer.
   4. Engineer shall have free access to all testing and records pertaining to materials to be delivered to the job site.
   5. The Engineer may elect to be present at any or all materials testing operations.

1.3 VALVE TYPES

A. Valves 12 inches and larger shall be butterfly valves.

2. PRODUCTS

2.1 GATE VALVES - (UNDER 12 INCHES)

A. Conform to AWWA C509 or C515.
B. Valves shall be resilient wedge, Clow, Waterous 500, M & H 4067, Mueller 2360 series, or American Flow Control Series 2500, no equal.
C. O-ring stuffing box.
D. Open counter-clockwise unless otherwise specified.
E. Non-rising stem type.
F. Equipped with a 2 inch standard operating nut.
G. Mechanical joint or push on joint suitable for installation with the type and class of pipe being used or flanged where detailed.
H. All flange faces shall be machined. Flanges shall be drilled to straddle vertical centerline.

2.2 BUTTERFLY VALVES

A. Conform to AWWA C504, Class 150B.
B. Valve shall be rubber seated, Pratt Groundhog.
C. Mechanical joint or push on joint suitable for installation with type and class of pipe being used or flanged where detailed.
D. Standard O-ring shaft seal.
E. Operator shall be traveling nut or worm gear type, sealed, gasketed and permanently lubricated for underground service.
F. Operator shall be designed to withstand all anticipated operating torques and designed to resist submergence in ground water.
G. Equipped with a standard 2 inch operating nut.
H. Open counter-clockwise.
I. Flanges shall be drilled to match fittings.

2.3 STEM EXTENSION

A. Provide stem extension with standard operating nut and self centering rock plate support for all valves with operating nut more than 4 feet below grade to raise operating nut to within 36 inches of the ground surface. Stem extensions for fire hydrant lateral valves (Type B and Type C) shall be of appropriate length to use with District's valve wrench and raise the wrench to rotate above the top of the hydrant.

2.4 VALVE BOXES

A. Provide for all buried valves.
B. Valve boxes and tops shall be cast iron 2 piece slip joint type.
C. Lengths suitable for the particular project or as specified.
D. Base corresponding to size of valve.
E. Cover shall have the word "Water" cast on it.

2.5 VALVE MARKER POST

A. Shall have a 4-inch minimum square section and a minimum length of 42 inches, with beveled edges.
B. Contain at least one No. 3 bar reinforcing steel.
C. Paint exposed portion of the marker posts with two (2) coats of concrete paint in a color selected by the District.
D. Stencil the size of the valve and the distance in feet and inches to the valve on the face of the post, using black paint and a stencil which will produce letters 2 inches high.

2.6 COMBINATION AIR RELEASE VALVE

A. Designed to operate with potable water under pressure to allow entrapped air to escape from the pipeline.
B. Body and cover: Cast iron conforming to ASTM A48, Class 30.
C. Floats: Stainless steel conforming to ASTM A240 and designed to withstand 1,000 psi pressure.
D. Seats: Buna N rubber.
E. Internal Parts: Stainless steel or bronze.
F. Designed to withstand 300 psi pressure with normal operating pressure under 100 psi.
G. Manufactured by APCO or equivalent with following listed orifice sizes:

Model No.	Size of Valve	Large Orifice	Small Orifice
143C	1"	1"	5/64"
145C	2"	2"	3/32"
147C	3"	3"	3/32"

H. Vault shall be precast concrete meter box or utility vault as indicated on the detail.

2.7 COMBINATION SEWAGE AIR AND VACUUM RELEASE ASSEMBLY

A. Combination sewer air and vacuum release assembly shall consist of an air release valve and an air and vacuum valve.
B. Valves shall be constructed for minimum pressure of 150 psi. Some valves may operate at certain times at less than 20 psi. Supplier shall evaluate normal operating conditions for each valve and furnish a valve capable of seating under normal conditions.
C. Assembly shall be manufactured by APCO or equivalent, Series 445.
D. Air release valves shall be especially adopted for use with sewage and shall be designed to vent gases under pressure:
   1. Body and cover: Cast iron conforming to ASTM A48, Class 30.
   2. Float and pins in mechanism: Stainless steel conforming to ASTM A240. Float shall be designed to withstand a minimum pressure of 1,000 psi. Float stem shall be elongated to provide an air gap between the mechanism and the sewage.

3. Seats: Bronze.
4. Mechanisms: Bronze or stainless steel.

E. The sewage air and vacuum valve shall be specially designed for use with sewage and shall be designed to vent large quantities of air when filling the line and to allow air to re-enter the line when the line is being drained:
1. Body, cover and baffle: Conforming to ASTM A48, Class 30.
2. Two floats having a common stainless steel float guide shall be provided. Floats shall be stainless steel conforming to ASTM A240 and designed to withstand a minimum pressure of 1,000 psi.
3. Seats: Buna N rubber.
4. Float stem and guides: Bronze or stainless steel.

F. Valves shall be provided with quick disconnect couplings and valves to permit back flushing without dismantling.

G. Vault Cover:
1. Design Load: H-20 traffic load 300 PSF minimum.
2. Door Leaf: 1/4 inch aluminum diamond pattern plate.
3. Access door shall be single leaf type, Oldcastle Precast or equivalent.
4. Door and frame shall be for dimensions shown.
5. Provide spring assisted operators for opening and hold open arm with release handle.
6. Provide recessed padlock hasp.
7. Hardware shall be stainless steel.

H. Vault shall be precast concrete utility vault as manufactured by Oldcastle Precast or equivalent designed for H-20 traffic loads.

I. Vent shall be brass pipe.

2.8 BLOW-OFF VALVE ASSEMBLY

A. Assemblies shall be Kupferle Model #78 2” blow-off hydrants with two and one-half inch (2-1/2”) NST nozzle, or Kupferele #7600 4” blow-off hydrants with four inch (4”) NST nozzle.

B. The hydrant shall have full drainage capabilities to prevent freezing after flushing.

C. All moving parts shall be enclosed and made from high quality brass.

D. The model used shall be suitable for underground installation.

2.9 VALVE VAULT HEATER

A. Provide when insulated vault is specified.

B. Conform to requirements of National Electric Code (NEC) latest edition.

C. Contractor to provide electrical service at his expense.

2.10 TAPPING SLEEVE AND VALVE ASSEMBLY

A. Furnished with flanged inlet end connections having a machined projection on the flanges to mate with a machined recess on the outlet flanges of the tapping sleeves and crosses.

B. Outlet ends shall conform in dimensions to the AWWA Standards for hub or mechanical joint connections, except that the outside of the hub shall have a large flange for attaching a drilling machine.

C. Seat opening of the valves shall be larger than normal size to permit full diameter cuts.

D. Tapping sleeves shall be cast iron, stainless steel, epoxy coated steel, or other approved materials.

E. Solid concrete bearing block shall be placed to support valve at time of installation.

3. EXECUTION

3.1 GATE VALVE OR BUTTERFLY VALVE INSTALLATION

A. Valves shall be accurately set at places designated on the drawings.

B. Inspect each valve for defects.
C. Adjust stuffing boxes to ensure water tightness without binding the stem.
D. Set valve and valve box plumb.
E. Set lower casting of valve box so that it is supported by a Styrofoam collar not less than 2 inches in thickness.
F. Tamp backfill around valve box to a minimum distance of 3 feet on all sides or to face of trench.
G. Set valve box cover flush with surface.

3.2 VALVE MARKER POST

A. Where required, set valve marker post at edge of right-of-way opposite the valve.
B. Leave 18 inches of post exposed above grade.

3.3 INSTALLATION OF COMBINATION AIR RELEASE VALVE

A. Install in accordance with standard detail.
B. Locate so that high point of water main is vented.
C. Pipe between main and valve shall slope upward.
D. Locate valve adjacent to property line unless otherwise indicated.

3.4 INSTALLATION OF COMBINATION SEWAGE AIR AND VACUUM RELEASE ASSEMBLY

A. Install in accordance with standard detail.
B. Locate so that high point of sewage force main is vented.
C. Adjust grade of force main so that valve assembly can be properly installed.
D. Pipe shall slope upward from force main to valve assembly.
E. Locate valve adjacent to property line unless otherwise indicated.

3.5 BLOCKING

A. Provide blocking for valve not connected to fitting with bolted connection.

3.6 TESTING

A. Test valves along with pipeline in which they are installed.

* * * END OF SECTION * * *

SECTION 02645
HYDRANTS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Excavating, Backfilling and Compacting for Utilities: Section 02222
C. Pipe and Fittings: Section 02610
D. Valves: Section 02640
E. Water Lines: Section 02660

1.2 QUALITY ASSURANCE

A. Testing by Manufacturer:
   1. Manufacturer shall test all materials as required by these Specifications and the standards referenced.
   2. Manufacturer shall submit to the Engineer two (2) copies of all test results which shall include a certification that materials to be delivered are represented by the samples tested and that such delivered materials meet or exceed the specifications requirements.
   3. No materials shall be delivered until test results and certifications are in the hands of the Engineer.
   4. Engineer shall have free access to all testing and records pertaining to materials to be delivered to the job site.
   5. The Engineer may elect to be present at any or all materials testing operations.

2. PRODUCTS

2.1 FIRE HYDRANTS

A. Conform to AWWA C502 except as herein modified.
B. Main valve opening of the hydrant shall be 5 1/4 inch diameter.
C. Provide mechanical (restrained) or flanged joint outlet with an auxiliary gate valve and valve box. Suitable lugs for anchor rods shall be provided. Provide valve stem extension per Section 02640.
D. One pumper nozzle to four and one half inch (4 ½") NST thread, equipped with Storz No. S-37 rigid female adapter, two (2) two and one-half inch (2-1/2") hose nozzles shall be provided.
E. Provide pentagon one and one-quarter inch (1 ¼") operating nuts.
F. Open by turning counterclockwise.
G. Nozzles and operating nuts shall be identical with the District's existing equipment or as elsewhere provided.
H. Nozzles shall be equipped with bronze nipples screwed into the hydrant and locked in place.
I. Depth of clear cover over the pipe shall be three (3) feet unless greater depth or cover is required where the hydrant is installed.
J. Provide lugs for shackling rods.
K. Provide sidewalk flange and safety stem coupling which will allow hydrant barrel to separate with minimum damage.
L. Paint with two coats of paint. Storz fitting is not to be painted.
   Color as directed by District:

Blue E24/B24 (Bonnets)	X-O Rust oil base enamel
White (Barrel and Caps)	Rustoleum #7792

M. The Contractor shall furnish the location of the nearest point at which replacement working parts are stocked.

N. Hydrant barrel extension standard of manufacturer of hydrant provided. Field verify bury height of hydrant prior to ordering.
O. Hydrants shall be as manufactured by Clow (Medallion), M & H (Style 929 Reliant), Mueller (Super Centurion 250) or Waterous (Pacer WB-67). Hydrants by any listed manufacturer shall be supplied with the following features:
Bronze set ring, bronze cross arm, weather shield nut, one-piece operating nut, UL/FM approved, interior of hydrant base and upper and lower valve washers epoxy coated, and flanged base.
P. Wrap fire hydrant lateral, riser and barrel with poly wrap.

2.2 GUARD POST

A. Precast concrete 8 inches in diameter by six feet long constructed with concrete having minimum strength of 3500 psi.
B. Reinforcing shall consist of minimum of five No. 3 deformed steel bars.

2.3 YARD HYDRANTS

A. Frost Proof Hose Bibbs:
1. Type: Nonfreezing, exposed head, stop and waste post hydrant with non-turning operating rod with free-floating compression closure valve, drain port, and operating key lock.
2. Size: 1 inch.
3. Hose Connection: 1 inch American National straight.
4. Rating: 150 psi.
5. End: Screwed.
6. Casing: Bronze.
7. Casing Guard: Cast aluminum.
8. Exposed Head: Bronze.
9. Interior Parts: All bronze.

B. Curb Stop and Waste Valves:
1. Type: 90` turn plug, solid tee head, with check and drain port.
2. Size: Same as line size.
3. Rating: 150 psi.
4. Body and Trim: Bronze.
5. Ends: Screwed.
6. Operators: Two portable tee wrenches supplied to service all buried yard curb stop and waste valves.
7. Service Boxes: Cast iron, 2½-inch minimum shaft diameter, cast iron lids marked "Water".

3. EXECUTION

3.1 SETTING HYDRANTS

A. Hydrants shall be inspected in the field upon arrival to ensure proper working order.
B. Hydrants shall be installed in accordance with the standard detail.
C. Hydrants shall not be installed within 3 feet of a travelled roadway.
D. A minimum 3-foot radius unobstructed working area shall be provided around all hydrants.
E. Sidewalk flange shall be set three (3) inches above finished grade (adjacent pavement elevation or as otherwise directed).
F. Hydrants shall be set on concrete blocks.
G. Hydrant drain shall waste into a pit of 1-1/4-inch minimum washed rock situated at the base of the hydrant as shown in the detail.
H. Hydrant laterals less than 50 feet long shall consist of a section of 6-inch ductile iron pipe from the main to the hydrant and shall include an auxiliary gate valve set vertically and placed in the line as indicated in the detail.

I. Hydrant branches over 50 feet long shall consist of a section of 8-inch ductile iron pipe and include required reducer to connect to hydrant. An auxiliary gate valve shall be installed on the branch at the main.
J. Hydrants shall be restrained as shown in the detail. Shackle rods shall be cleaned and painted after installation with 2 coats of asphalt varnish, or with such other bituminous paint as may be approved by the Engineer. For valves and fittings on fire hydrant laterals, install MARS Zinc Caps on all fitting and valve bolts.
K. Any new or existing hydrant not in service shall be identified by covering with a burlap or plastic bag.
L. Install guard posts only where specifically directed by the District.
M. A blue reflective pavement marker shall be installed where directed by the District.
N. Protect hydrant and valve box with concrete pad(s) per standard detail.

3.2 RESETTING OR RELOCATING EXISTING HYDRANTS

A. Conform to applicable requirements for setting new hydrants.
B. Material requirements to be adjusted to field conditions.

3.3 HYDRANT BARREL EXTENSIONS

A. Provide where required due to placement of main at greater than normal depth or for adjustment to surface grade.

3.4 TESTING

A. Test hydrants along with pipeline on which they are installed.

* * * END OF SECTION * * *

SECTION 02660
WATER LINES

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Dewatering: Section 02140
C. Shoring: Section 02150
D. Excavating, Backfilling and Compacting for Utilities: Section 02222
E. Pipe and Fittings: Section 02610
F. Valves: Section 02640
G. Hydrants: Section 02645
H. Existing Utilities/Facilities Underground and Overhead: Section 02760

1.2 QUALITY ASSURANCE

A. Testing Before Acceptance:
   1. The Engineer may require that the first section of pipe, not less than 1,000 feet in length, installed by each of the Contractor's crews, be tested in order to qualify the crew and/or the material.
   2. Pipe laying shall not be continued more than an additional 1,000 feet until the first section has been tested successfully.

B. Final Acceptance:
   1. Prior to final inspection all pipelines shall be flushed and cleaned of all debris, disinfected and hydrostatically tested.
   2. Any corrections required shall be made at the expense of the Contractor and the line retested.

2. PRODUCTS

2.1 BEDDING MATERIALS

A. Conform to Section 02222.

2.2 ALTERNATE PIPE MATERIALS

A. Pipe used for water line construction may be either ductile iron, or polyvinyl chloride pressure pipe as specified in Section 02610 unless otherwise specified.
B. Pipe for water services shall be as indicated on the detail for the utility and as specified in Section 02610.
C. When ductile iron pipe is specified, no substitute is permitted.
D. Steel pipe shall be used only where specifically called for on the drawings.

3. EXECUTION

3.1 BEDDING FOR RIGID PIPE

A. Bedding for rigid pipe except ductile iron shall be as specified in Section 02222.
B. Unless otherwise ordered, bedding for ductile iron may be native bedding material, free of stones.
C. Bedding shall be carefully placed under the pipe and to a depth of at least six (6) inches over the top of the pipe.
D. Shall be thoroughly rammed and tamped around the pipe with the proper tools, so as to provide firm and uniform support over the full length of all pipe, valves and fittings.
E. Care shall be taken to prevent any damage to the pipe or its protective coating.

3.2 BEDDING FOR FLEXIBLE PIPE

A. Material to be used for bedding for flexible pipe shall be sand/gravel material as specified in Section 02222.
B. Bedding shall be placed in more than one lift. The first lift is to provide at least 4-inch thickness under any portion of the pipe and shall be placed before the pipe is

installed, and shall be spread smoothly so that the pipe is uniformly supported along the barrel.

C. Subsequent lifts of not more than 6-inch thickness shall be installed to 6 inches over the crown of the pipe and individually compacted to 90 percent of maximum density.

3.3 PIPE LAYING

A. Pipe laying shall be done in accordance with the Specifications and instructions of the manufacturer of the kind of pipe used.

B. Tools designed especially for installing each particular type and kind of pipe shall be used.

C. Short Lengths and Field Cut Joints:
   1. Short lengths of pipe supplied by the manufacturer shall be used to provide the proper spacing of valves, tees or special fittings.
   2. Whenever it becomes necessary to cut a length of pipe, the cut shall be made by abrasive saw or by a special pipe cutter.
   3. Pipe ends shall be square with the longitudinal axis of the pipe and shall be reamed and otherwise smoothed so that good connections can be made.
   4. Threads shall be cleanly cut.
   5. Flaring of copper tubing shall be accurately and smoothly done.
   6. All operations for any connection shall be carefully done in accordance with the manufacturer's instructions.

D. Laying of Pipe on Curves:
   1. Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints or by the use of shorter lengths of pipe.
   2. When pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment.
   3. Where field conditions require deflection or curves not anticipated by the Plans, the Contractor shall use deflected joints, short lengths or special fittings as required. No additional payment will be made for laying pipe on curves as shown on the Plans or for field changes involving pipe deflected at the joints. When special fittings not shown on the Plans are required to meet field conditions, additional payment will be made for fittings.
   4. Maximum deflections at pipe joints and laying radius for various pipe lengths shall be as recommended by the pipe manufacturer.

E. Contamination Prevention:
   1. Pipe, fittings and valves shall be carefully cleaned of all dirt and foreign material as they are placed.
   2. Open ends of pipe and fittings shall be plugged with a temporary watertight plug whenever work is stopped and/or when water in the trench threatens to enter the pipe.
   3. Groundwater shall be excluded from the pipe at all times.
   4. Particular care shall be exercised to guard against the entrance of sewage into the water line trench during the course of construction. All sewer lines, house side sewers or other subsurface drains should be located prior to excavation. Adequate provision shall be made for the flow of sewers, drains, and other water courses during construction.

F. Condition of Pipe and Fittings:
   1. The interior of all pipe, fittings and other accessories stockpiled on the project shall be kept free of dirt and other foreign matter at all times.
   2. Each pipe, fitting or other accessory shall be carefully inspected and thoroughly cleaned of any dirt or foreign matter that might be present on the inside.
   3. Cleaning shall be accomplished prior to lowering the pipe or other accessories into the trench.

4. Care shall be taken to keep materials internally clean after the pipe is placed in the trench.

3.4 BLOCKING AND BRACING

A. Blocking and bracing of the pipe and fittings shall be placed so as to secure bearing on undisturbed earth.
B. Blocking and bracing size shall be determined by the Contractor and shall be of sufficient proportions and installed so as to withstand the required test pressure and operating conditions.
C. Concrete shall be placed in back of all fittings with unbalanced thrust. Pre-cast blocking shall not be used.
D. Blocking shall not be covered up without its having been seen by the Engineer.
E. Blocking shall be formed so that bolts, joints, gaskets, and flanges of adjacent joints are clear of the concrete and so that bolts and joints can be dismantled without removing the concrete.
F. At tees and crosses where future mains connect, a pre-cast concrete brick may be used between fittings and thrust block.
G. Unless otherwise called for in the Bid Form, the cost of furnishing and installing all blocking shall be included in the price bid per lineal foot of pipe or lump sum bid if unit prices are not required.

3.5 CONNECTION TO EXISTING WATER MAINS

A. An approved backflow prevention assembly (double check valve assembly or better) must be used on the supplying water line when filling the new water main during disinfection and flushing. The assembly and supply piping must be removed or isolated during hydrostatic pressure testing of the new main.
B. Type of connections shall be as shown on the Drawings.
C. Wet tap connections made without shutting off the existing line shall be made unless otherwise approved by the District.
D. Connections to the existing water main shall not be made without first making the necessary arrangements with the District in advance.
E. Work shall not be started until all of the materials; equipment and labor necessary to properly complete the work are assembled on the site.
F. When work is once started on this connection, it shall proceed continuously without interruption and as rapidly as possible until completed. No shut-off of mains will be permitted overnight or over weekends or holidays.
G. If the connection to the existing system involves turning off the water, the Contractor shall be responsible for notifying the residents affected by the shut-off. The District will advise which owners are to be notified.
H. The Contractor may be required to perform the connection during times other than normal working hours.
I. The Contractor shall not operate any valves on the existing system without specific permission of the District.
J. The types of connections are varied and suggested pipe arrangements have been shown on the Plans. In general, they involve deflecting new pipe to match the existing pipe alignment and utilization of necessary fittings and new pipe. For the installation of these connections, the surfaced portion of the road shall not be penetrated unless the connecting point is directly under it. For connection by any other method, the Contractor shall furnish a detailed sketch for approval not less than one week prior to the expected construction.
K. Interior of pipe and fittings used in making connections shall be swabbed or sprayed with a 1% solution of hypochlorite before they are installed.
L. Exterior of main shall be cleaned and interior surface of tapping sleeve shall be dusted with calcium hypochlorite powder before tapping sleeve is installed.

M. Installation of tapping tee shall be tested with air or water at a minimum pressure of 100 psi before cutting into the existing line.
N. Any replacement pipe used for cutting into existing mains shall be same material and strength as existing pipe except that ductile iron may be substituted for other materials.

3.6 EXISTING SYSTEM MAINTENANCE

A. The Contractor shall acquaint himself with all aspects of the existing system prior to starting construction on new mains. Pertinent information concerning existing system may be obtained from the District and from the District's records.
B. Materials, fittings, pumps, equipment and qualified personnel must be available on the project at all times during construction, so that in the event of damage to or disruption of the existing water system service there will be immediate repair and restoration by the Contractor. Any unnecessary delay in repairs or service restoration due to Contractor's failure to adhere to these requirements shall be reason to immediately suspend any further new main installation until repairs are completed to the District's satisfaction.
C. Existing water services shall be located by the Contractor prior to beginning work so that it may be properly protected and maintained in service during construction and during the changeover from the existing pipes to the pipe installed under this Contract.

3.7 SERVICE CONNECTIONS

A. Service connections to water mains shall be made using saddles of the size and type suitable for use with the pipe being installed.
B. The depth of trenching for service connection piping shall be such as to provide cover over the top of the pipe as shown on the service detail.
C. Particular care shall be exercised to assure that the main is not damaged by installation of the service line.
D. Service lines shall be cut using a tool or tools specifically designed to leave a smooth, even, and square end on the piping material to be cut. Cut ends shall be reamed to the full inside diameter of the pipe.
E. Where shown in the plans, existing water service connections shall be reconnected to the new water mains installed under this Contract using the materials specified. The location of water service connections shall be verified in the field by the Contractor.
F. Pipe materials used to extend or replace existing water service lines shall be in accordance with utility’s standard details for new service.
G. Insulating couplings shall be used at any connection between galvanized steel or iron pipe and copper pipe.
H. Contractor shall arrange his work to minimize interruptions of water service to existing water customers.
I. Line shall be installed, tested and disinfected up to point of connection prior to interruption of service.
J. Customer shall be notified prior to shutting off service. Time that water is shut off shall be held to a minimum.

3.8 HYDROSTATIC PRESSURE TEST (NOT HDPE PIPE)

A. Water mains and appurtenances (including water service connections on new water mains) shall be tested in sections of convenient length under a hydrostatic pressure equal to 150 psi in excess of that under which they will operate.
B. The pumps, gauges, plugs, saddles, corporations, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished and operated by the Contractor.
C. Pipeline shall be backfilled sufficiently to prevent movement of pipe under pressure.

D. Thrust blocks shall be in place and time allowed for the concrete to cure before testing.
E. Procedure:
   1. The mains shall be filled with water and all air removed prior to starting the test.
   2. The test shall be accomplished by pumping the main up to the required pressure; stop the pump for fifteen (15) minutes, and then pump the main up to the test pressure again.
   3. The quantity of water required to restore the pressure shall be accurately determined by pumping through a positive displacement water meter with a sweep unit hand registering 1 gallon per revolution. The meter shall be approved by the Engineer.
   4. Acceptability of the test will be determined by two factors:
      a. The quantity of water lost from the main shall not exceed the number of gallons per hour as determined by the formula:

$$L = \frac{ND(P)^{0.5}}{7,400}$$

in which

L = Allowable leakage, gallons/hour
N = No. of joints in the length of pipeline tested
D = Nominal diameter of the pipe in inches
P = Average test pressure during the leakage test, psig

      b. There shall not be an appreciable or abrupt loss in pressure during the fifteen (15) minute test period.
   5. Gauges used in the test shall be accompanied with satisfactory certifications of accuracy from a laboratory approved by the Engineer.
F. All tests shall be made with the hydrant gate valves open and pressure against the hydrant valve. After the test has been completed, each gate valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the gate valve will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked.
G. Sections to be tested shall normally be limited to 1,500 feet.
H. Prior to calling out the Engineer to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to assure himself that the pipe is in a satisfactory condition.

3.9 DISINFECTION OF MAINS

A. Before being placed in service, all new water mains and repaired portions of, or extensions to, existing mains shall be chlorinated and a satisfactory bacteriological report obtained.
B. Temporary or permanent physical connections shall not be allowed between the existing distribution system and non-disinfected pipelines constructed under this Contact without a State Department of Health approved backflow preventer (double check valve assembly or better) temporarily installed in the connecting line.
C. Main sterilization shall be accomplished by either of the following two methods at the Contractor's option. No other method of sterilization will be accepted by the Engineer, unless, prior to use, the Contractor obtains written approval from the Engineer.
D. Method No. 1:
   1. A chlorine gas-water mixture, or dry chlorine gas may be applied by means of a chlorinator, or the gas may be fed directly from a chlorine cylinder equipped with the proper devices for regulating the flow, and the effective diffusion of gas within the pipe. Use of the chlorinator is preferred to direct feed from the cylinder.

2. The preferable point of application for the chlorinating agent is at the beginning of the pipeline extension, or any valved section thereof, and through a corporation cock inserted in the horizontal axis of the pipe. The water injector for delivering the gas-water mixture into the pipe may be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension. In a new system, application may be at the pumping station, elevated tank, stand pipe, or reservoir.
3. Water from the existing distribution system, or other source of supply, shall be controlled to flow very slowly into the newly laid pipeline during application of the chlorine. The rate of chlorine gas-water mixture or dry gas feed shall be in such proportion that the rate of water entering the newly laid pipe will be at least 50 parts per million.
4. Back pressure, causing a reversal of flow in the pipe being treated, shall be prevented.
5. Treated water shall be retained in the pipe at least twenty-four (24) hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least twenty-five (25) parts per million.
6. In the process of chlorinating newly laid water pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.
7. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity, until the replacement water throughout its length, upon test, shows the absence of chlorine or in the event chlorine is normally used in the source of supply, until the tests shall show a residual not in excess of that carried by the system.
8. Should the initial treatment prove ineffective; the chlorination procedures shall be repeated until tests show that the water sample from the newly laid pipe conforms to the requirements of this specification.

E. Method No. 2:
1. A mixture of either calcium or sodium hypochlorite of known chlorine content and water may be substituted as an alternative for liquid chlorine. (Typical commercial products of this type are HTH, Perchloron, Clor, Purex, etc.).
2. Prepare a solution containing approximately 5% available chlorine by weight, in the case of HTH or Perchloron, at 70% available chlorine, use 6 pounds per 10 gallons of water. In the case of Clor, at 15% available chlorine, add 2 parts of water to 1 part of Clor. For other strength compounds, adjust dilutions accordingly.
3. To prepare the chlorine compound-water mixture, first make a paste, and then thin to slurry, to ensure getting all active ingredients into solution. The prepared solution shall be injected by means of a hypo-chlorinator, or hand or engine operated pump. Retention time, parts per million and pumping into the newly laid pipe shall follow the conditions outlined under Method No. 1 for chlorine applications.
4. Provisions for flushing and bacteriological testing under this alternative shall be the same as those described in Method No. 1 above.

F. Before placing the lines in service, a satisfactory report or approval shall be received by the District on samples collected from representative points in the new system.

G. Sterilized sample bottles and/or instructions shall be obtained by the Contractor from the laboratory where the samples will be tested unless the District directs otherwise. Bacteriological test samples will be taken by the District. Corporation stops shall be inserted in the main by the Contractor at all locations required to take bacteriological

test samples. If original test samples prove unsatisfactory, District may charge Contractor the cost for processing each additional sample.

H. Discharge of hypo-chlorinated water to surface waters is strictly prohibited. The environment to which the chlorinated water is to be discharged shall be inspected by the District and, if there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to be wasted to neutralize the chlorine residual remaining in the water. Disposal may be made to any available sanitary sewer provided the rate of disposal does not overload the sewer and the disposal is approved by the sewer agency having jurisdiction. The sewer agency shall be given 48 hours advance notice of such disposal. Where necessary, federal, state, and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

3.10 FLUSHING THE MAINS

A. Upon completion of pipe laying, chlorination and pressure testing, all dirt and foreign matter shall be removed by a thorough flushing through all hydrants, blow-offs or other approved means. Each section of newly laid pipe between valves or dead ends shall be flushed independently, and fire hydrants or other dead end appurtenances shall be flushed simultaneously with the parent line. A minimum flushing velocity of 2.5 fps shall be developed in the main.

B. The Contractor shall be responsible for scheduling and organizing his work so as to use flushing water only during off-peak hours and in the most economical manner.

C. Taps required by the Contractor for temporary or permanent release of air, chlorination or flushing purposes shall be provided by the Contractor as a part of the construction of water mains.

D. No flushing shall be performed without the prior approval of the District.

3.11 CHLORINATING CONNECTIONS TO EXISTING WATER MAINS AND WATER SERVICE CONNECTIONS

A. The chlorinating procedure to be followed shall be as specified in AWWA Standard C651. All closure fittings shall be swabbed with a very strong chlorine solution at least as strong as liquid household bleach (5-6% Cl).

3.12 PLACING IN OPERATION

A. Upon completion of the work and before its final acceptance, the entire system shall be put in operation under normal pressure and operated at that pressure for a period of not less than ten (10) days by the Contractor.

B. Any leaks or defects in the construction of the system that may develop shall be repaired and the test continued until the system is practically watertight.

C. No provision of this Section shall be construed as waiving any provision of the Contractor's guarantee.

3.13 LEAK TESTING FOR HDPE PIPE

A. Perform tests in accordance with ASTM F2164 and on reasonable lengths of pipe. Sections to be tested shall normally be limited to 1,500 feet.
B. The pumps, gauges, plugs, saddles, corporations, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished and operated by the Contractor.
C. Pipeline shall be backfilled sufficiently to prevent movement of pipe under pressure. The water, pipe, and soil shall be allowed to thermally stabilize before the test is conducted.
D. Thrust blocks shall be in place and time allowed for the concrete to cure before testing.
E. The leak testing shall not exceed the maximum hydrostatic test pressure of 150% of the normal HDPE pipe pressure rating measured at the lowest elevation in the section.
F. Remove or isolate any components that may be damaged by pressure testing. Isolated equipment shall be vented.
G. The test duration shall not exceed eight (8) hours from the time of initial pressurization until piping is depressurized. If the testing is not completed within 8 hours, the pipe must be depressurized and allowed to relax for 8 hours prior to re-pressurizing pipe for renewed testing.
H. Leak testing shall be conducted using clean water as the testing medium.
I. The Contractor shall vent all trapped air from the segment of piping being tested prior to initiating the leak test. Pressure testing against closed valves is not acceptable.
J. Leak testing shall incorporate two phases:
    1. Initial expansion phase:
        a. Gradually pressurize to test pressure of 1.5 times the system design pressure and maintain pressure for 3 hours. Add makeup water as necessary each hour for three (3) hours to maintain the target pressure in the section of pipe that is being tested. It is not necessary to monitor the amount of water added during the initial expansion phase.
    2. Testing phase:
        a. Start immediately following initial expansion phase.
        b. Monitor amount of makeup water required to maintain test pressure for one, two or three hours. If the amount of make-up water needed to maintain test pressure does not exceed the amount listed below, no leakage is indicated.

	Make-up Water Allowance for Test Phase (Gallons/100 ft of pipe)		
Nominal pipe size	1 Hour Test	2 Hour Test	3 Hour Test
8-inch	0.5	1.0	1.5
10-inch	0.8	1.3	2.1
12-inch	1.1	2.3	3.4
14-inch	1.4	2.8	4.2
16-inch	1.7	3.3	5.0
18-inch	2.0	4.3	6.5

Portion of Table 3 from PPI Handbook of Polyetheylene Pipe. Test phase make-up amounts for pipe testing at 150% of pipe's rated pressure. For lower pressures, use ratios.

        c. At the conclusion of the testing phase, carefully depressurize the pipeline with the controlled release of water. The water shall be drained and disposed in accordance with the requirements above.
        d. The test documentation provided to the Engineer shall include:

1) Test medium.
2) Test pressure.
3) Test duration.
4) Test data.
5) Pressure recording chart or pressure log.
6) Chart of pressure vs. makeup water added during testing phase.
7) Pressure at high and low elevations.
8) Elevation at point test pressure is measured.
9) Ambient temperature and weather conditions.
10) Pipe and valve manufacturers.
11) Pipe specifications and/or standards.
12) Description of the test section length, location, and components.
13) Description of any leaks, failures, and their repair/disposition.
14) Person conducting the test, test times, and test dates.

K. Prior to calling out the Engineer to witness the leak test, the Contractor shall have all equipment set up and completely ready for operation.

L. Should leakage exceed 5% of the test pressure, the leak(s) shall be located and repaired. The pipe shall be retested no sooner than 8 hours after depressurization to confirm that it meets the testing requirements.

* * * END OF SECTION * * *

SECTION 02730
SANITARY SEWERS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Shoring: Section 02150
C. Excavating, Backfilling and Compacting for Utilities: Section 02222
D. Existing Utilities/Facilities Underground and Overhead: Section 02760

1.2 QUALITY ASSURANCE

A. Testing Before Acceptance:
   1. The Engineer may require that the first section of pipe, not less than 300 feet in length, installed by each of the Contractor's crews be tested in order to qualify the crew and/or the materials.
   2. Pipe laying shall not be continued more than an additional 300 feet until the first section has been tested successfully.

B. Final Acceptance:
   1. Prior to final inspection all pipelines shall be flushed and cleaned and all debris removed.
   2. Before sewer lines are accepted, all lines shall be tested as specified herein and inspected for line and grade by checking each section between manholes for alignment. A full circle of light shall be seen by looking through the pipe at a light held in the manhole at the opposite end of the section of sewer line being inspected.
   3. All lines shall be tested for leakage.
   4. Deflection test shall be performed on all flexible pipe, where in the District's opinion, video inspection warrants it.
   5. All lines shall be video inspected.
   6. Any corrections required shall be made at the expense of the Contractor and the line retested.

1.3 PROTECTION OF LIVE SEWERS

A. All existing live sewers including septic tanks and drain fields shall remain in service at all times. Adequate provision shall be made for disposal of existing sewage flow if any existing sewers are damaged.
B. Any damage to the District's existing system shall be repaired to a condition equal to or better than that existing prior to the damage at no cost to the District.
C. The existing system is discharged through some sewers with flat grades and in some cases through lift stations. All water accumulating during construction shall be removed from the new sewers and shall not be permitted to enter the existing system. The Contractor will be required to flush out the existing lines and/or repair lift stations or other facilities if gravel, rocks or other debris are permitted to enter the existing lines.
D. The physical connection to an existing manhole or sewer line shall not be made until so authorized by the District. This authorization will not be given until all upstream lines have been completely cleaned, all debris removed, and where applicable, a pipe temporarily placed in the existing channel and sealed.

1.4 USE OF SEWERS PRIOR TO COMPLETION

A. The District hereby reserves the right to make use of any portion of the work prior to completion of the entire Contract without invalidating the Contract and without constituting acceptance of any of the work.

2. PRODUCTS

2.1 BEDDING MATERIALS

A. Refer to Section 02222.

2.2 GENERAL REQUIREMENTS FOR PIPE MATERIAL

A. Pipe used for sewer construction shall be specified in Section 02610 unless otherwise provided.

B. All pipe shall have flexible watertight joints utilizing rubber gaskets, unless otherwise specified.

C. All pipe shall meet the minimum strength requirements as specified for concrete pipe unless otherwise provided. Any rigid pipe material substituted for the class specified shall have a minimum three edge strength equal to or greater than that of the concrete pipe class indicated. Flexible pipe of the class specified herein or on the drawings shall be considered equivalent in load supporting capacity to rigid pipe as indicated, unless otherwise specified.

D. When ductile iron pipe is specified, no substitute is permitted.

3. EXECUTION

3.1 SURVEY LINE AND GRADE

A. The Contractor shall constantly check line and grade of the pipe and in the event they do not meet specified limits, the work shall be immediately stopped, the Engineer notified, and the cause remedied before proceeding with the work.

3.2 BEDDING

A. Proper preparation of foundation, placement of foundation material where required, and placement of gravel bedding shall precede the installation of all sewer pipe. This shall include the necessary preparation of the native trench bottom and/or the top of the foundation material as well as placement and compaction of required gravel bedding to a uniform grade. Gravel bedding around the pipe will be placed in a manner to meet requirements specified herein.

B. If no bedding class is specified for rigid pipe, Class B bedding shall be provided.

C. Class F bedding shall be provided for all flexible pipe.

D. The gravel bedding shall be placed so that the entire length of the pipe will have full bearing on the bedding. No blocking of any kind shall be used to adjust the pipe to grade except when used with embedment concrete. Bell holes shall be dug to assure uniform support along the pipe barrel.

E. It may be necessary to change bedding classifications and the limits thereof during the progress of the construction, consistent with the requirements outlined under the definitions and requirements of the various classifications contained herein.

F. Where unauthorized excavation has been made below the established grade, the Contractor shall provide, place and compact suitable bedding material to the proper grade elevation at his own expense.

G. Classification of Bedding:

1. Class A (Special Concrete Bedding) shall consist of a pipe cradle constructed of Portland cement concrete containing not less than four (4) sacks of cement per yard. Maximum aggregate size shall be 1/2 inches. Maximum slump shall be 4 inches. The Contractor shall protect pipe against flotation during the pouring of the concrete. The bottom of the trench shall be fully compacted before placement of pipe or cradle. Cradle construction shall conform to the Standard Detail.

2. Class B (Normal Gravel Bedding) shall consist of the leveling of the bottom of the trench and/or the top of the foundation material at the appropriate elevation, and the furnishing and placing of gravel bedding under the pipe and along the sides of the pipe. Minimum thickness of the layer of gravel bedding required under any portion of the pipe shall be four inches for all pipe sizes of 27 inches diameter and smaller, and six inches for all pipe sizes of 30 inches diameter and larger. Bedding shall extend up to the mid-point of rigid pipe. Gravel bedding shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the pipe.
3. Class C (Shallow Gravel Bedding) shall meet the requirements outlined for Class B bedding except that gravel bedding need be placed only to the lower quadrant of the pipe. This type of bedding will be used only where specifically designated on the Plans and only for shallow pipelines.
4. Class D (Native Bedding) shall consist of carefully excavating the trench to proper grade and placing select native material around the pipe. Native bedding, as described, shall be considered as incidental to the construction and all costs thereof are included in the unit contract price of the Contract. Native bedding shall be used only where specifically called for or specifically authorized by the Engineer.
5. Class F bedding shall be placed in more than one lift. The first lift to provide at least 4-inch thickness under any portion of the pipe shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6-inch thickness shall be placed to 6 inches over the crown on the pipe and individually compacted to 95% of maximum density. Material shall be gravel bedding material described in Section 02222.

3.3 PIPE LAYING

A. Laying of sewer pipe shall be accomplished to line and grade in the trench only after it has been dewatered and the foundation and/or bedding has been prepared.
B. Mud, silt, gravel and other foreign material shall be kept out of the pipe and off the jointing surfaces.
C. Pipe laid shall be retained in position by mechanical means or otherwise, as to maintain alignment and joint closure until sufficient backfill has been completed to adequately hold the pipe in place. Wherever moveable shoring (steel box) is used in the ditch, pipe shall be restrained by use of a winch mounted in the downstream manhole and a line of sufficient strength threaded through the pipe and set tightly before each move. Any indication that joints are not being adequately held shall be sufficient reason to require this or other equivalent method of restraint, whether or not moveable shoring is being used.
D. Variance from established line and grade shall not be greater than 1/32 of an inch per inch of pipe diameter, not to exceed 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, 1/2 inch maximum.
E. The sewer pipe 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.
F. When pipe laying is not in progress the forward end of the pipe shall be kept tightly closed with a temporary plug.

G. As the pipe is installed, it shall be backfilled with the specified gravel bedding material up to an elevation 6 inches above the pipe crown, taking care that the gravel bedding is in contact with the entire periphery of the pipe. The gravel bedding shall be so carefully placed and firmly compacted that the subsequent backfilling operations will not disturb the pipe in any way.
H. Pipe branches, stubs or other open ends that are not to be connected immediately shall be plugged with approved material consistent with these Specifications and secured in place.
I. The markings on reinforced concrete pipe indicating the minor axis of the elliptical reinforcement shall be placed in a vertical plane (top of bottom) when the pipe is laid.
J. Install concrete anchors on sewers laid on slopes of 20% or greater in accordance with Standard Detail.

3.4 PIPE JOINTING

A. All extensions, additions and revisions of the sewer system, unless otherwise specified, shall be made with sewer pipe jointed by means of a flexible gasket which shall be fabricated and installed in accordance with these Specifications.
B. 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 and replaced, cleaned and re-lubricated if required before the jointing is attempted.
C. 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.
D. 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.
E. At the end of the work day, the last pipe laid shall be blocked to prevent creep during "down time."
F. For dissimilar pipes where suitable adaptor couplings are not available, the jointing shall be accomplished with a special factory fabricated coupling.

3.5 SIDE SEWER STUBS

A. All applicable Specifications given herein for sewer construction shall apply to side sewers.
B. Provide side sewer stubs extending to the right of way line for all properties adjacent to main line sewer unless otherwise directed by the District.
C. Unless authorized in writing by the District, excavation for main line sewers shall not begin more than 1,000 feet ahead of the completion of side sewer construction in the public right-of-way.
D. Sewers are designed to serve the downstream side of properties. Exceptions shall be as directed by the District at the time of construction. Such exceptions shall be marked by a stake or other suitable marker. Contractor shall be responsible that a "tee" be located in the main line opposite each marker and shall construct a side sewer to terminate at the property lines, edge of easements, or as otherwise directed by the District.

E. The Contractor shall be responsible that the side sewer depth at the property line is 5 feet below the floor to be served, or 6 feet below street centerline, whichever is deeper. Where the property is vacant, the side sewer shall be constructed on a slope of 2% unless otherwise approved in writing by the District.
F. Side sewer stubs shall not be installed as vertical risers, but shall be laid on a slope not to exceed two feet vertical to one foot horizontal.
G. Side sewer stubs shall be constructed with a maximum deflection not to exceed manufacturer's recommendations. Larger changes in direction shall be made by use of standard 1/8 bends.
H. Plugs shall be installed at end of line and blocked to withstand test pressures without leakage.
I. A 1¼-inch white PVC pipe, ASTM 2241 SDR 21 200 psi shall be placed vertically at the end of the side sewer stub and shall rise 2 feet above finish grade level. Both ends of the PVC pipe shall have caps glued on and the pipe interior kept clean for the purpose of future depth measurement.
J. General requirements for side sewer stub construction are shown on Standard Detail entitled "Street Side Sewer". Any side sewer contractor shall also satisfy all requirements relating to side sewer construction as set forth in the "Side Sewer Rules and Regulations" of the District. Side sewer inspection for work under the Contract will be performed without charge to the Contractor.
K. No side sewers shall be constructed inside private property unless approved in writing by the District.
L. The Contractor shall not backfill any side sewer stub until the District has visually inspected and approved the installation. Should any such work be covered up without such approval or consent it must, if required by the District, be uncovered for examination at the Contractor's expense.

3.6 CLEANING

A. Before acceptance testing is performed, the pipe installation should be reasonably clean. The pipe shall be cleaned either before or after testing the pipe in the following or equivalent manner.
B. The Contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the pressure of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction and/or repair any damaged pipe. All visible leaks showing flowing water in pipelines or manholes shall be stopped even if the test results fall within the allowable leakage.

3.7 LEAKAGE TESTING

A. General Requirements:
    1. All sanitary sewer pipe and appurtenances shall be cleaned and tested after backfill by the low-pressure air test method. Pipe over 36 inches in diameter may be tested a joint at a time with the water exfiltration method or by low pressure air test.
    2. All work involved in cleaning and testing sewer lines between manholes shall be completed within fifteen (15) working days after the backfilling of sewer lines and structures.

3. The Contractor shall furnish all labor, materials, tools and equipment necessary to make the test, to clean the lines and to perform all work incidental thereto.
4. Precautions shall be taken to prevent joints from opening during tests, and any damage resulting from tests shall be repaired by the Contractor at his own expense.
5. In the event that the Contractor elects to test large diameter pipe one joint at a time, leakage allowances for water exfiltration per 100 feet shall be converted to allowances per joint by dividing by the number of joints occurring in 100 feet.
6. If the pipe installation fails to meet these requirements, the Contractor shall determine at his own expense the source or sources of leakage, and he shall replace all defective materials or workmanship. The completed pipe installation shall then be retested as required to meet the requirements of this test.

B. Low Pressure Air Test:
1. Recommended Procedure:
   a. Pipe may be tested with or without pre-wetting.
   b. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
   c. If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the pipe and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to groundwater submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.
   d. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig in excess of any groundwater backpressure.
   e. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any failures are observed, bleed off air and make necessary repairs.
   f. After an internal pressure is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
   g. After that two minute period, disconnect air supply.
   h. When pressure decreases to 3.5 psig over groundwater backpressure, start stopwatch. Determine the time in seconds that is required for the internal air pressure to drop 1.0 psig. This time interval should then be compared with the time required by Specification.
2. Safety Precautions:
   a. Plugs used to close the sewer pipe for the air test must be securely braced to prevent the unintentional release of a plug which can become a high velocity projectile. Gauges, air piping manifold and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Air testing apparatus shall be equipped with a pressure release device designed to relieve pressure in the pipe under test at 6 psi.
3. Basis of Acceptance:
   a. Concrete and clay pipe (36 inches and under): The rate of air loss shall not exceed 0.003 CFM per square foot of internal pipe surface except that the computed rate for the test shall be not less than 2 CFM nor more than 3.5 CFM.
   b. Other pipe materials: The time for the test shall be four (4) times that computed for concrete and clay pipe.
   c. Pipe over 36 inches in diameter: Each joint shall show no appreciable loss of pressure when held for thirty (30) seconds.

4. Limit of Test Section:
    a. Pipe less than 36 inches in diameter shall be tested from manhole to manhole or such shorter lengths as the Contractor may choose.
    b. Pipe over 36 inches in diameter shall be tested one joint at a time.
5. Excessive Infiltration:
    a. The Engineer may require an infiltration test if it appears that there is excessive infiltration after air tests are completed. The Engineer shall also be the sole judge of whether or not this test is required. Excessive infiltration shall be cause for rejection.

C. Exfiltration Test:
1. Exfiltration test shall be used only if specifically authorized by the Engineer.
2. Contractor may fill the pipe any time up to 24 hours prior to the time of exfiltration testing to permit normal absorption into the pipe walls.
3. Leakage shall be no more than 0.28 gph per inch diameter per 100 feet of sewer, with a hydrostatic head of six feet above the crown at the upper end of the test section, or above the natural groundwater table at the time of test, whichever is higher.
4. Where the test head is other than six feet, the measured leakage shall not exceed 0.28 gph per inch diameter per 100 feet times the ratio of the square root of the test head to the square root of six.
5. The length of pipe tested shall be limited so that the pressure at the lower end of the section tested does not exceed 16 feet of head above the invert, and in no case shall be greater than 700 feet or the distance between manholes when greater than 700 feet.
6. It shall be the Contractor's responsibility to determine the level of the water table at each manhole.

D. Infiltration Test:
1. Infiltration test shall be used only if specifically authorized by the Engineer.
2. Infiltration testing shall take place only when the natural groundwater table is above the crown of the higher end of the test section.
3. Infiltration test leakage shall not exceed 0.16 gph per inch diameter per 100 feet, when the natural groundwater head over the pipe is two feet or less above the crown of the pipe at the upper end of the test section.
4. Where the natural groundwater head is more than two feet, the measured leakage shall not exceed 0.16 gph per inch diameter per 100 feet times the ratio of the square root of the natural groundwater head to the square root of 2.
5. The length of pipe tested shall not exceed 700 feet or the distance between manholes when greater than 700 feet.

3.8 DEFLECTION TEST FOR FLEXIBLE PIPE

A. Sanitary sewers constructed of flexible pipe shall be deflection tested not less than 30 days after the trench backfill and compaction has been completed.
B. The test shall be conducted by pulling a solid pointed mandrel with a circular cross section with diameter equal to 95% of the inside pipe diameter through the completed pipeline. Minimum length of circular portion shall be equal to the diameter of the pipe.
C. Testing shall be conducted on a manhole to manhole basis and shall be done after the line has been completely flushed out with water.
D. Contractor will be required, at his expense, to locate and repair any sections failing to pass the test and to retest the section.

3.9 VIDEO INSPECTION

A. The District requires all sewers to be inspected by the use of a video camera before final acceptance. The costs incurred in making the inspection shall be borne by the Contractor.
B. A device will be attached in front of the camera to measure the depth of any ponding water.
C. Any observed defects or ponded water with a depth of over 3/4 inch shall be cause for the rejection of the line.
D. The Contractor shall bear all costs incurred in correcting any deficiencies found during television inspection including the cost of any additional television inspection that may be required by the District to verify the correction of said deficiency.
E. The Contractor shall be responsible for all costs incurred in any video inspection performed solely for the benefit of the Contractor.
F. Video equipment shall consist of a self-contained camera and a monitoring unit connected by three wire coaxial cable.
G. Camera shall be small enough to ensure passage through a six-inch diameter sewer; 3-inch for side sewer inspections, shall be waterproof, and shall have a self-continuous 650-line resolution picture showing the entire inside periphery of the pipe.
H. Furnish video recordings of the sewer lines on CD, DVD or flash drive in MP4 or similar file format readable by Windows Media Player or Quicktime software.
I. Video inspection shall be performed on one manhole section at a time by propelling the television camera through the line along the axis of the pipe. The inspection shall be performed in a forward (upstream) direction, unless otherwise allowed by the District.
J. Video inspection shall result in a continuous recording, beginning with the camera above grade with a pan view of the immediate vicinity of the originating manhole, then continuing while camera is placed in sewer and advanced to end manhole or segment being inspected.
K. The video inspection shall be done at a speed (maximum 0.5 feet per second) and quality that allows the District to identify all pipe defects and sewer branches.

3.10 REPAIRS

A. Any pipe or appurtenance which has been laid or jointed that is not in conformance with the Specifications shall be repaired or be removed and replaced at the expense of the Contractor.
B. Any concrete pipe or manhole with any continuous crack having a surface width of 0.01 inch or more extending for a length of 12 inches or more regardless of position in the wall of the pipe or main shall be removed and replaced.
C. Repair bands or clamps or concrete collars shall not be used to repair defective pipe.

3.11 TESTING HDPE PIPE AND SADDLE TEES

A. Before acceptance testing is performed, the replacement sewer main pipe shall be clean. The sewer main pipe shall be cleaned before testing in the manner described or in an alternative manner as approved by the District.
B. Following completion of inserting the HDPE pipe and prior to connecting lateral service connections, each segment of HDPE pipe shall be pressure tested. The pipe shall be subjected to an air test of 4 psig for ten (10) minutes with no measurable pressure loss. Failure of the pressure test shall be cause for rejection of the installation.
C. All sidewall fusion and electrofusion saddle tees shall be individually air pressure tested prior to cutting hole in sewer main pipe. Saddle tees that cannot be tested in this manner shall not be used. The saddle tee shall be subjected to an air test of

4psig for ten (10) minutes with no measurable pressure loss. Failure of the pressure test shall be cause for rejection of the installation.

D. If leakage occurs, the Contractor shall determine the source(s) of any leakage and shall repair or replace the line and conduct a re-test at no additional cost to the District. Proposed repairs shall be approved by the District.
E. Contractor shall furnish all facilities and personnel for conducting the pressure tests under the observation of the Engineer.
F. The complete pipe installation shall meet the requirements of this test, before being considered acceptable.

* * * END OF SECTION * * *

SECTION 02732
SEWER FORCE MAINS

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420
B. Dewatering: Section 02140
C. Shoring: Section 02150
D. Excavating, Backfilling and Compacting for Utilities: Section 02222
E. Manholes and Cleanouts: Section 02605
F. Pipe and Fittings: Section 02610
G. Sanitary Sewer: Section 02730
H. Existing Utilities/Facilities - Underground and Overhead: Section 02760

1.2 QUALITY ASSURANCE

A. Testing Before Acceptance
   1. The Engineer may require that the first section of pipe, not less than 300 feet in length, installed by each of the Contractor's crews be tested in order to qualify the crew and/or the material.
   2. Pipe laying shall not be continued more than an additional 300 feet until the first section shall have been tested successfully.

B. Final Acceptance:
   1. Prior to final acceptance all pipelines shall be flushed and cleaned of all debris and the line tested as specified herein.
   2. Any corrections required shall be made at the expense of the Contractor and the line retested.

2. PRODUCTS

2.1 BEDDING MATERIALS

A. Conform to Section 02222.

2.2 PIPE MATERIALS

A. Pipe used for sewer force main may be ductile iron, HDPE or PVC pressure pipe as specified in Section 02610, unless otherwise noted.
B. Locator tape and a tracer wire shall be installed with the force main per Section 02610.2.16.

3. EXECUTION

3.1 INSTALLATION

A. Bedding and pipe laying of force mains shall conform to the applicable provisions for water lines as set forth in Section 02660.
B. Minimum depth of cover shall be 42 inches unless otherwise shown on the Drawings.
C. Pipe shall be laid on a uniform grade with no sags or over bends between high and low points shown on the Drawings.
D. Cover of sewage air valve assembly vault shall be accurately adjusted to grade and slopes of ground surface.

3.2 BEDDING FOR FLEXIBLE PIPE

A. Material to be used for bedding for flexible pipe shall be sand/gravel material as specified in Section 02222.
B. Bedding shall be placed in more than one lift. The first lift is to provide at least 4-inch thickness under any portion of the pipe and shall be placed before the pipe is installed, and shall be spread smoothly so that the pipe is uniformly supported along the barrel.

C. Subsequent lifts of not more than 6-inch thickness shall be installed to 6 inches over the crown of the pipe and individually compacted to 90 percent of maximum density.

3.3 PIPE LAYING

A. Pipe laying shall be done in accordance with the Specifications and instructions of the manufacturer of the kind of pipe used.

B. Tools designed especially for installing each particular type and kind of pipe shall be used.

C. Short Lengths and Field Cut Joints:

1. Short lengths of pipe supplied by the manufacturer shall be used to provide the proper spacing of valves, tees or special fittings.
2. Whenever it becomes necessary to cut a length of pipe, the cut shall be made by abrasive saw or by a special pipe cutter.
3. Pipe ends shall be square with the longitudinal axis of the pipe and shall be reamed and otherwise smoothed so that good connections can be made.
4. Threads shall be cleanly cut.
5. All operations for any connection shall be carefully done in accordance with the manufacturer's instructions.

D. Laying of Pipe on Curves:

1. Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints or by the use of shorter lengths of pipe.
2. When pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment.
3. Where field conditions require deflection or curves not anticipated by the Plans, the Contractor shall use deflected joints, short lengths or special fittings as required. No additional payment will be made for laying pipe on curves as shown on the Plans or for field changes involving pipe deflected at the joints. When special fittings not shown on the Plans are required to meet field conditions, additional payment will be made for fittings.
4. Maximum deflections at pipe joints and laying radius for various pipe lengths shall be as recommended by the pipe manufacturer.

3.4 BLOCKING AND BRACING

A. Blocking and bracing of the pipe and fittings shall be placed so as to secure bearing on undisturbed earth.

B. Blocking and bracing size shall be determined by the Contractor and shall be of sufficient proportions and installed so as to withstand the required test pressure and operating conditions.

C. Concrete shall be placed in back of all fittings with unbalanced thrust. Pre-cast blocking shall not be used.

D. Blocking shall not be covered up without its having been seen by the Engineer.

E. Blocking shall be formed so that bolts, joints, gaskets, and flanges of adjacent joints are clear of the concrete and so that bolts and joints can be dismantled without removing the concrete.

F. At tees and crosses where future mains connect, a pre-cast concrete brick may be used between fittings and thrust block.

G. Unless otherwise called for on the Bid Form, the cost of furnishing and installing all blocking shall be included in the price bid per lineal foot of pipe or lump sum bid if unit prices are not required.

3.5 PRESSURE TESTS

A. Sewer force mains shall be subjected to the hydrostatic test described in Section 02660 except that pressure tests shall be made at a pressure equal to twice the working pressure of the pipe line or 75 psi in excess of the working pressure of the line, whichever is greater, unless otherwise specified.

B. The pumps, gauges, plugs, saddles, corporations, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished and operated by the Contractor.
C. Pipeline shall be backfilled sufficiently to prevent movement of pipe under pressure.
D. Thrust blocks shall be in place and time allowed for the concrete to cure before testing.
E. Prior to calling out the Engineer to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to assure himself that the pipe is in a satisfactory condition.

3.6 LEAK TESTING FOR HDPE PIPE

A. Perform tests in accordance with ASTM F2164 and on reasonable lengths of pipe. Sections to be tested shall normally be limited to 1,500 feet.
B. The pumps, gauges, plugs, saddles, corporations, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished and operated by the Contractor.
C. Pipeline shall be backfilled sufficiently to prevent movement of pipe under pressure. The water, pipe, and soil shall be allowed to thermally stabilize before the test is conducted.
D. Thrust blocks shall be in place and time allowed for the concrete to cure before testing.
E. The leak testing shall not exceed the maximum hydrostatic test pressure of 150% of the normal HDPE pipe pressure rating measured at the lowest elevation in the section.
F. Remove or isolate any components that may be damaged by pressure testing. Isolated equipment shall be vented.
G. The test duration shall not exceed eight (8) hours from the time of initial pressurization until piping is depressurized. If the testing is not completed within 8 hours, the pipe must be depressurized and allowed to relax for 8 hours prior to re-pressurizing pipe for renewed testing.
H. Leak testing shall be conducted using clean water as the testing medium.
I. The Contractor shall vent all trapped air from the segment of piping being tested prior to initiating the leak test.
J. Leak testing shall incorporate two phases:
    1. Initial expansion phase:
        a. Pressurize to 1.5 times the rated pressure of the pipe.
        b. Add makeup water as necessary each hour for three (3) hours to maintain the target pressure in the section of pipe that is being tested.
    2. Testing phase:
        a. Reduce the pressure by 10 psi.
        b. Monitor pressure for one (1) hours at the lowest point in elevation.
        c. No leakage is indicated if the pressure remains steady within 5% of the test pressure.
        d. The test documentation provided to the Engineer shall include:
            1) Test medium.
            2) Test pressure.
            3) Test duration.
            4) Test data.
            5) Pressure recording chart or pressure log.
            6) Chart of pressure vs. makeup water added.
            7) Pressure at high and low elevations.
            8) Elevation at point test pressure is measured.

9) Ambient temperature and weather conditions.
10) Pipe and valve manufacturers.
11) Pipe specifications and/or standards.
12) Description of the test section length, location, and components.
13) Description of any leaks, failures, and their repair/disposition.
14) Person conducting the test, test times, and test dates.

K. Prior to calling out the Engineer to witness the leak test, the Contractor shall have all equipment set up and completely ready for operation.

L. Should leakage exceed 5% of the test pressure, the leak(s) shall be located and repaired. The pipe shall be retested no sooner than 8 hours after depressurization to confirm that it meets the testing requirements.

* * * END OF SECTION * * *

SECTION 02760
EXISTING UTILITIES/FACILITIES
UNDERGROUND AND OVERHEAD

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Inspection Services: Section 01420

B. Excavating, Backfilling and Compacting for Utilities: Section 02222

1.2 LEGAL REQUIREMENTS UNDERGROUND FACILITIES

A. The Contractor shall, before commencing excavation in any area, comply with the provisions of revised RCW 19.122 (E25HB 1634) and any other applicable laws relating to or governing the identification, location, marking, and responsibility for protecting and repairing of underground facilities.

B. Whenever there may be a conflict between the provisions of any law and the provisions of these specifications, the provisions of law shall control.

1.3 DEFINITIONS

A. Utility means any facility or item placed above or below ground for use in connection with the storage or conveyance of water, sewage, electronic, telephonic or telegraphic communication, cablevision, electric energy, petroleum products, gas, gaseous vapors, hazardous liquids, or other substances and including, but not limited to pipes, sewers, conduits, cables, valves, lines, wires, manholes, and attachments.

B. Pipe zone is defined as extending from the bottom of the required excavation to six (6) inches over the top of the pipe.

1.4 IDENTIFICATION

A. All underground utilities known by the District to be in the proposed area of excavation are identified on the project plan.

B. The underground utilities identified on the plans have not and cannot be precisely located by the District or its agents or engineers and location is approximate only because such information is within the control of the owners of the underground utilities. The District, under this Contract, does not warrant the location of underground utilities.

C. NOTICE: Overhead electrical service lines are generally not shown on the drawings. Electrical transmission lines shown on the drawings are located by point to point, power pole to power pole connections. The transmission cables or wires may be located on either side of the drawing location depending upon the configuration of the crossarms on the power poles or towers. Line voltage is not shown.

D. Other overhead utility lines are generally not shown on the drawings.

1.5 NOTIFICATION

A. It is the responsibility of the Contractor to give notice to the District or owners of any utilities known or suspected to be within the area of any proposed excavation or construction activities.

B. The Contractor is responsible to have the locations of underground utilities marked by the utility owners prior to beginning excavation.

C. The Contractor is responsible for determining the extent of any hazard created by electrical power in all areas and shall follow procedures during construction as required by law and regulation. Prior to construction, the Contractor shall meet with utility owners and determine the extent of hazards and remedial measures and shall take whatever precautions may be required.

D. The Contractor's attention is directed to federal, state, and local safety codes relative to limitations of work in proximity to overhead power lines.

1.6 QUALITY ASSURANCE

A. The Contractor will be required to have available a pipe finder and a person capable in its use and to utilize same to satisfy himself as to the exact location of such underground facilities in the interest of avoiding unnecessary damage, maintenance costs, and to insure continuity of customer service.

B. Contractors shall cooperate with utility owners to aid in locations and maintenance of existing utilities.

1.7 ELECTRICAL TRANSMISSION AND SERVICE LINES

A. Since neither the Engineer nor the District can anticipate the construction methods or techniques and equipment to be used by the Contractor in performing the work, the extent of the possibility of the Contractor's equipment and personnel coming in contact with electrical transmission lines cannot be fully anticipated, and there is no representation that all electrical transmission lines are shown on the plans.

B. The Contractor is charged with the responsibility of observing and investigating the presence of any electrical transmission lines which might impinge on his work whether overhead or underground and shall consult with and utilize the information given by utility owners and operators to determine the extent of any hazards and remedial measures required, and follow appropriate safety procedures.

1.8 ABOVE GROUND UTILITIES

A. Existing above ground utilities, whether shown on the drawings or not, shall be maintained, relocated, rerouted, removed and restored as may be necessary by the Contractor in a manner satisfactory to owners and operators of the utilities.

1.9 UTILITY SERVICE LATERALS

A. Minor underground utility service lines, including but not limited to sanitary sewer services, gas services, water services, house or yard drains, and electricity or telephone services and driveway culverts shall be maintained, relocated, rerouted, removed and restored by the Contractor with the least possible interference with such services.

B. Even though the presence of minor underground utility service lines may be deemed changed or differing conditions, in no case shall the interference of such service lines be the basis for extra compensation except in the case of a conflict, not shown on the plans, with sanitary sewer service occurring at an elevation between the top and bottom of the proposed pipeline or structure together with the pipe zone, the Contractor will be reimbursed for costs thereof in accordance with Article 13 of the General Conditions.

1.10 RESTORATION BY UTILITY OWNER

A. The right is reserved by owners of public utilities and franchises to enter upon any street, road, right-of-way, or easement for the purpose of maintaining their property and for making necessary repairs or adjustments caused by the Contractor's operations.

B. The Contractor shall save the District harmless of any costs so incurred in restoration of a utility damaged by the Contractor except in special cases outlined above, and subject to the provisions of any law.

1.11 RESTORATION OF DRAINAGE FACILITIES

A. Where it is necessary for drainage facilities to be removed and replaced, existing pipe and catch basins may be reinstalled when approved by the agency having jurisdiction.

B. The materials shall be cleaned.

C. When it is necessary to replace existing pipe or catch basins, the new materials shall be of equal strength and similar design to existing materials.
D. Installation shall be in accordance with the applicable provisions of these specifications.
E. All costs, whether new or existing facilities are installed, shall be considered to be included in the unit prices bid for the various items and no additional payment shall be allowed.

* * * END OF SECTION * * *

SECTION 02990
LANDSCAPE RESTORATION

1. GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Protection of Work and Property: Section 01545

1.2 SUBMITTALS

A. Duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed testing laboratory within 6 months before the date of delivery on the project.

B. Duplicate copies of certification from grower certifying the grass species and locations of field from which sod was cut.

1.3 JOB CONDITIONS

A. Areas landscaped and/or seeded prior to construction shall be restored to their original condition.

B. Unless otherwise specified, the Contractor shall have the option of reseeding or resodding lawn areas that are disturbed during construction.

C. A cover crop shall be sown in all areas other than landscaped areas that are excavated or disturbed during construction. Cover crop seeding shall follow backfilling operations by not more than three weeks. Weekly seeding shall be required for projects in which all backfilling cannot be completed in three weeks.

D. All plants or shrubs within landscaped areas that are damaged during construction shall be replaced with plants equal to that existing prior to construction. Any covenants to stipulations in easements shall be adhered to.

E. All areas shown on the Plans to be planted, seeded or sodded shall be accomplished in accordance with this section.

2. PRODUCTS

2.1 TOPSOIL

A. Topsoil that is required to be furnished by the Contractor from a source other than the area upon which it will be placed shall consist of fertile, friable soil, preferably of a loamy character, typical of the topsoil common to the locality and it shall contain a normal amount of organic matter.

B. It shall be obtained from arable land and shall be free from subsoil, refuse and other deleterious substances. It shall be reasonably free from brush, roots, heavy clay, sticks and other litter and shall contain no stones or gravel larger than 1/2 inch in diameter.

C. It shall be free of toxic amounts of either acid or alkaline elements and be capable of sustaining healthy plant life.

D. It shall be approved by the Engineer before placement.

2.2 SEED

A. Grasses and legumes for cover crop seed shall conform to the standards of State Department of Agriculture. Seed shall be furnished in standard containers on which shall be shown the following information:

1. Common name of seed
2. Lot number
3. Net weight
4. Percentage of purity
5. Percentage of germination (in case of legumes percentage of germination to include hard seed).
6. Percentage of weed seed content and inert material clearly marked for each kind of seed in accordance with applicable state and federal laws.

2.3 FERTILIZER

A. General:

1. Fertilizer shall be a standard commercial grade of slow-release organic or inorganic fertilizer of the kind and quality specified herein.
2. All fertilizers shall be furnished in standard unopened containers with weight, name of plant nutrients, and manufacturer's guaranteed statement of analysis clearly marked, all in accordance with state and federal laws.
3. Fertilizer shall be ground to a fineness as required for the method of application.

B. Fertilizer Ratio:

Nitrogen	10
Phosphorus	4
Potassium	6

2.4 MULCH

A. Wood Cellulose Fiber:

1. Wood cellulose fiber mulch shall be specially processed wood fiber containing no growth or germination inhibiting factors and shall be dyed a suitable color to facilitate inspection of the placement of the material.
2. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material will become uniformly suspended to form homogeneous slurry.
3. Each package shall be marked by the manufacturer to show the air dry weight content.

B. Peat:

1. Peat shall be a natural domestic product of either sphagnum moss, reed or sedge peat, taken from a freshwater site, free from lumps, roots and stones.

C. Straw:

1. All straw mulch material shall be in an air dried condition free of noxious weeds, weed seeds, and other materials detrimental to plant life.
2. Straw shall be seasoned before baling or loading.
3. Straw mulch shall be suitable for spreading with mulch blower equipment.

2.5 SOD

A. Imported Sod:

1. Sod shall be of first quality turf grass sod composed of acceptable grass mixtures, relatively weed free.
2. Sod shall be machine cut to a uniform soil thickness not less than 3/4 inch or more than 1 inch. Individual sod pieces shall be cut to a standard width and to an acceptable length which provides for efficient and proper installation.
3. Sod shall be harvested, delivered and installed within a 48 hour period.
4. The Contractor, upon request, shall submit one standard piece of sod for the Engineer's approval.

B. Native Sod:

1. Native sod shall be replaced in the lawn of original removal.
2. The area of sod to be removed shall be laid out in squares or strips of such size as to provide easy handling and matching. The sod shall then be carefully cut along these lines taking care to keep all cuts straight and strips of the same width. After the sod has been cut vertically, it shall be removed to a uniform depth with an approved type of sod cutter. This operation shall be performed in such manner as to ensure uniform thickness of sod throughout the operation.
3. As the sod scalping proceeds, the sod strips shall be placed in neat piles at convenient locations and from then on they shall be maintained in a damp

condition continuously until the sod strips are replaced on the lawn. In no case shall the sod remain in piles longer than 10 days before replacement on the lawn.

2.6 PLANT MATERIALS

A. Plants shall be healthy, in vigorous growing condition, and be guaranteed true to size, name and variety. Nomenclature shall be listed in Standardized Plant Names, Second Edition, 1942.

B. Size and quality shall be equal to existing plants or as shown on the Plans. Plants shall be No. 1, nursery grown, freshly dug, of normal growth and habit, free from diseases and insects.

3. EXECUTION

3.1 LAWN SEEDING

A. All areas to be put into lawn shall have a minimum depth of 8 inches of topsoil.

B. Immediately prior to placing topsoil, the surface area upon which it is to be placed shall be cleaned of objectionable matter and the area shall be smoothed and compacted.

C. The finish grade of all areas to be put into lawn shall be smooth, without visible depressions or mounds and shall be flush with the top of adjoining curbs, walks and drives.

D. After establishing the finish grade, all areas shall be hand raked, rolled and again hand raked, removing all rocks, weeds and debris.

E. Commercial fertilizer shall be applied at the rate of 2 pounds per 1,000 square feet.

F. Lawn seed shall be seeded over all areas to be put into lawn at the rate of 3 pounds per 1,000 square feet.

G. After seeding, ground horticultural peat moss shall be spread 1/4 inch deep with an approved spreader over all seeded areas.

H. The exact time for seeding will be determined by actual weather conditions. The normal satisfactory periods for seeding shall be considered as being between March 1 and May 1 and between September 15 and October 20.

I. When delays in operations carry the work beyond the most favorable planting season, or when weather conditions are such that satisfactory results are not likely to be obtained for any stage of the seeding operations, the Contractor will stop the work and it shall be resumed only when the desired results are likely to be obtained or when approved alternates or corrective measures and procedures are adopted.

J. Maintenance shall commence immediately on planting and the lawn area shall be kept damp for 10 days to 2 weeks. Protect all seeded areas by watering, mowing and replanting as necessary for at least 30 days and as long as necessary to establish a uniform stand of grass, and a minimum of 2 cuttings.

3.2 SOD

A. Prior to placing the strips of sod, the scalped area shall be carefully shaped to proper grade and be thoroughly compacted. Wherever the construction operations have resulted in the placement of unsuitable or poorer soils in the area to be resodded, the surface shall be left low and covered with topsoil.

B. The finished grade, after shaping and compacting the topsoil, shall be thoroughly dampened prior to and immediately before replacing the sod.

C. The sod shall be replaced to the required grade, taking care to butt each piece tightly against the adjacent one.

D. Upon completion, the sod shall be dampened and rolled with a lawn roller.

E. All sod shall be kept moist during the first week after sodding. Water shall be provided for each of the next three weeks to provide a minimum of 2 inches of moisture per week.

3.3 COVER CROP SEEDING

A. Seeding shall not be done during windy weather or when the ground is frozen, excessively wet or otherwise untillable.
B. Seed may be sown by one of the following methods:
   1. Hydroseeded which utilizes water as the carrying agent, and maintains continuous agitation through paddle blades. It shall have an operating capacity sufficient to agitate, suspend and mix into homogeneous slurry of the specified amount of seed and water or other material. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with a set of hydraulic discharge spray nozzles which will provide a uniform distribution of the slurry.
   2. Blower equipment with an adjustable disseminating device capable of maintaining a constant, measured rate of material discharge that will ensure an even distribution of seed at the rates specified.
C. Grass seed shall be seeded at the rate of 130 pounds per acre.
D. Fertilizer shall be applied at the rate of 90 pounds per acre.
E. Wood cellulose fiber shall be applied at the rate of 1 ton per acre.
F. The exact time for seeding will be determined by actual weather conditions. The normal satisfactory period for seeding shall be considered between March 1 to June 1 and September 1 to November 1 unless otherwise authorized by the District except that the Contractor may perform seeding operations from June 1 to September 1 provided that he waters the new grass to the satisfaction of the District.
G. When delays in operations carry the work beyond the most favorable planting season, or when weather conditions are such that satisfactory results are not likely to be obtained for any stage of the seeding operations, the Contractor will stop the work and it shall be resumed only when the desired results are likely to be obtained or when approved alternates or corrective measures and procedures are adopted.
H. The Contractor shall protect all seeded areas from erosion until final inspection and acceptance has been made. Areas damaged by erosion shall be repaired by the Contractor at his own expense.

3.4 PLANTING PITS

A. Trees: Vertical sides, flat bottom, circular or square 6-inch minimum planting soil below ball and/or roots, diameter or side dimension 2 feet greater than root system or ball diameter.
B. Shrubs conform to A above except diameter or side dimension 1 foot greater than ball diameter or root.
C. Bulbs, bedding plants and ground cover 12 inches below finished grade.

3.5 PLANTING TREES, SHRUBS, GROUND COVER, BULBS AND BEDDING PLANTS

A. Use planting soil beneath and around cavity between plant ball or roots and pit sides. Tamp base firmly, place plant or tree, tamp soil in layers, thoroughly water each layer, loosen and fold burlap away from top of ball into pit. Fill balance of cavity with planting soil. Soak and continuously maintain adequate moisture.
B. Use approved root transplanting compounds and herbicides for bulbs and plants to prevent disease and assure best plant growth.
C. Leave watering "saucers" around each plant.
D. Support trees immediately after planting by staking and/or guying to maintain trees in plumb position.
E. Apply mulch where shown or noted on the Drawings. Mulch depth shall be 3 inches unless otherwise noted.
F. Fertilize all trees, shrubs and ground covers at time of planting.

3.6 FINAL INSPECTION

A. Final inspection for seeded areas will not be made until thirty (30) days following completion of all seeding, fertilizing, and mulching as specified. Damage caused by the Contractor to areas which have been seeded or sodded shall be repaired and/or replaced by the Contractor at his own expense.

3.7 GUARANTEE

A. Guarantee of planting and seeding shall continue for one year from date of final project acceptance. Contractor shall replace all plants or sod dead or dying within the guarantee period, or reseed lawns and cover crop where required. Guarantee shall include both materials and labor. Replacements shall be the same as originally planted.

* * * END OF SECTION * * *