PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

OREGON

CONTRACT DOCUMENTS
for
ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET & CITY HALL FRONTAGE IMPROVEMENTS PROJECT
CIP #702105 & 538105

May 30, 2014

Address Bids and Direct Questions to:
City of Newberg, City Hall
Attention: Gabriel Rivas, Project Manager 503.554.1631
Location: 414 E. First Street, Newberg, OR 97132
Mailing: P.O. Box 970, Newberg, OR 97132

TABLE OF CONTENTS
ADA Sidewalk Improvements on Blaine Street &
City Hall Frontage Improvements

NOTICE TO SELECT CONTRACTORS
INVITATION TO BID
"ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET" AND "CITY HALL FRONTAGE IMPROVEMENTS"

Bids for the "**ADA Sidewalk Improvements on Blaine Street"** and **"City Hall Frontage Improvements"** will be accepted until **4:30 PM Wednesday, the 11th day of June 2014**. Bids submitted after this day will not be accepted. Address bids and send all questions to Gabriel Rivas, Project Manager at City of Newberg Engineering Services Department, 414 E. First Street, Newberg, Oregon 97132, 503.554.8851, or email gabriel.rivas@newbergoregon.gov.

There are two major components for this project. The first is the ADA improvements along Blaine Street. The second is the sidewalk rehabilitation in front of the Newberg City Hall.

The fist component includes but is not limited to the construction of six (6) ADA Sidewalk Ramps and limited demolition of existing sidewalk and curb & gutter.

The second component of the project includes, but not limited to, the removal and reinstallation of four (4) street trees, removal and reinstallation of new sand set pavers, installation of city provided bike racks and the removal and reinstallation of select concrete sidewalk panels.

The Engineer's Estimate for this project is in the range of $9,000 to $14,000.

This is a public works project that is not subject to BOLI prevailing wage rates. By signing the bid, the bidders agree to comply with all tax laws and the successful bidder shall carry Workers' Compensation and Unemployment Insurance in accordance with ORS 656.001 through 656.794. No bid for a construction contract shall be considered unless the bidder is registered with the Construction Contractors Board as required by ORS 701.035 to 701.055. A City of Newberg Business License is required. Bidder must have general liability insurance.

Bids may be submitted through e-mail to gabriel.rivas@newbergoregon.gov**.**

Each bid must be submitted with the prescribed form completely filled out and signed, in a sealed envelope, clearly marked that it is a bid, and have the bidder's name and the project title on the outside of the envelope. Failure to provide the required documents will result in disqualification of the bid.

The City of Newberg reserves the right to reject any bid not in compliance with these bidding procedures and requirements and may reject for good cause any or all bids on a finding of the City that it is in the public interest to do so; and to accept the bid which is in the best interest of the City. No bidder may withdraw their bid for a period of sixty (60) calendar days after the date set for opening.

Gabriel Rivas
Project Manager

PART 1

BID DOCUMENTS

BID SCHEDULE

"ADA Improvements on Blaine Street" and "City Hall Frontage Improvements"

Project Description: Furnish all equipment, materials, and labor necessary to complete the construction of six (6) ADA ramps, curb & gutter, four (4) street trees, sand set pavers, concrete sidewalk panels, concrete panels with a waterproofing admixture, the installation of City provided bike racks and all work shown on the "Blain Street ADA Improvements on Blain Street" and "City Hall Frontage Improvements" plans. All costs associated with the competition of this project must be written on this BID Schedule or the costs will be considered incidental. Bidder is responsible for the demolition/ haul off of demolished materials and providing a safe corridor for vehicular and pedestrian traffic during the entire construction process.

ITEM #	DESCRIPTION	APPLICABLE SECTION (not limited to)	UNIT	QNTY	UNIT PRICE	AMOUNT
	GENERAL per email					
1	Mobilization (Including ~~performance bond, payment bond~~, insurance, city business permit and all other permits) Assume no city permit for work (Sidewalk)	§201	LS	1	$ 100.-	$ 100.-
2	Site Restoration & Cleanup (Haul off all demolished material)	§208	LS	1	$ 500.-	$ 500.-
					Subtotal for GENERAL =	$ -
	IMPROVEMENTS					
3	City Hall Frontage Improvements	per plans	LS	1	$ 7350.-	$ 7350.-
4	ADA Sidewalk Improvements on Blaine Street	per plans	LS	1	$ 8250.-	$ 8250.-
					Subtotal for IMPROVEMENTS =	$ -

TOTAL BID = $ 16200.-

TOTAL BID IN WRITING = Sixteen thousand two hundred no/100

Chris Szedlak President
Concrete Solutions Incorporated
1540 NE Alpha Drive
McMinnville, OR 97128
CCB 98316
(503) 437-2233

BID 1

PART 2

CONTRACT DOCUMENT

CAPITAL IMPROVEMENT PROJECT CONTRACT
PROJECT NO. 702105 & 538105

THIS CONTRACT is made and entered into on the last date set forth below, by and between the City of Newberg, 414 E. First Street, Newberg, Oregon 97132, hereinafter called the "OWNER" and

Concrete Solutions Incorporated hereinafter called "CONTRACTOR".

Pursuant to a request for bid, contractor filed with Owner a bid containing an offer to perform the work required to complete the project named below. Owner has determined that the contractor is the lowest responsible bidder.

IT IS AGREED:

First: Contractor shall comply with the requirements of the contract documents for:

"ADA Sidewalk Improvements on Blaine Street" and "City Hall Frontage Improvements"
(Official Title of the Project)

Second: In consideration of contractor's compliance with this contract, Owner shall pay to contractor, at the times and in the manner provided by this contract, a total sum of:

SIXTEEN THOUSAND TWO HUNDRED DOLLARS
(The basic contract price in words)

(and figures) $ 16,200 which sum is subject to increase or decrease as the quantities named in the bid are changed as provided in this contract.

Third: Contractor has included all costs associated with the completion of the above named project(s) in BID SCHEDULE, submitted to the City on June 11th, 2014, or the costs are considered to be incidental.

Fourth: The work shall be completed by:

July 30, 2014

Fifth: The contract documents, which are made a part of this contract by actual attachment or by this reference, are:

1. The Contract Documents and Specifications, including an invitation to submit a bid for the project named above by title,
2. The detailed plans, "**ADA Sidewalk Improvements on Blaine Street**" and "**City Hall Frontage Improvements**".
3. The City of Newberg, Public Works Technical Requirements, current edition, unless specified otherwise in the Contract Documents, and
4. The bid of the contractor that was submitted on June 11, 2014.

CONTRACT FOR CONSTRUCTION - PAGE 2

CONTRACTOR DATA, CERTIFICATION, AND SIGNATURE:

Name (please print): _____ Title: _____

Company Name: _____

Address: _____

Social Security #: _____ CCB#: _____

Federal Tax ID #: _____ State Tax ID #: _____

Citizenship: Nonresident alien _____Yes _____No

Business Designation (check one): _____Individual _____Sole Proprietorship

_____Corporation _____Government/Nonprofit

_____Partnership* *if partnership, list names of partners:

_____

The above information must be provided prior to contract approval. Payment information will be reported to the Internal Revenue Service (IRS) under the name and taxpayer I.D. number provided above. (See IRS 1099 for additional instructions regarding taxpayer ID numbers.) Information not matching IRS records could subject you to 31 percent (31%) backup withholding.

I, the undersigned, understand that documents referred to above are an integral part of this contract and agree to perform the work described in accordance with the terms and conditions of this contract; I certify under penalty of perjury that I/my business am not/is not in violation of any Oregon tax laws; and certify I am an independent contractor as defined in ORS 670.600.

Signed by Contractor: _____ _____

Signature Date

_____

Print Name

NOTICE TO CONTRACTOR: This contract does not bind the City of Newberg unless and until it has been approved by the City Attorney or Designee and executed by the City Manager or Designee.

CITY OF NEWBERG SIGNATURE

Reviewed: _____ _____

Project Manager Date

Reviewed: _____ _____

City Engineer Date

Approved: _____ _____

City Manager or Designee Date

Approved as to form: _____ _____

City Attorney or Designee Date

CERTIFICATE OF COMPLETION

Project: "ADA Sidewalk Improvements on Blaine Street" and "City Hall Frontage Improvements"

Contractor: _____

Contract Signed: _____ Contract Expires: _____

Contract Completed: _____ Delinquent: _____

I, (We) hereby certify that all work has been performed and materials supplied in accordance with the plans, specifications and contract documents for the above work, and that:

1. There have been no unauthorized substitutions or assignment of subcontractors; nor have any subcontracts been entered into without the names of the subcontractors having been submitted to the Owner prior to the start of such subcontracted work;

2. All claims and indebtedness for material and labor and other service performed in connection with these specifications have been paid;

3. All moneys due the Industrial Accident Fund and the State Department of Revenue (ORS 279C.505) have been paid; and

4. All private property and easement areas have been satisfactorily restored in accordance with the contract.

I hereby certify that I have completed my contract, furnished the materials, and performed the work as shown by the final estimate of the Public Works Director, according to the plans, specifications and contract documents.

_____ _____

Contractor *Date*

The City hereby accepts the project as complete in compliance with the plans, specification and contract documents.

_____ _____

Project Manager *Date*

_____ _____

Public Works Director or designee *Date*

The date of signing by the Contractor constitutes the beginning of the two-year warranty period. The contractor may provide a letter, on company letterhead, guaranteeing the workmanship of all construction items in lieu of the maintenance bond.

PART 3

SPECIAL PROVISIONS

SPECIAL PROVISIONS

1. LENGTH OF CONTRACT

Construction work on the **ADA Sidewalk Improvements on Blaine Street Project** and **City Hall Frontage Improvements** shall begin within three (3) business days after issuance of the Notice to Proceed from the City. Work is considered substantially completed when curbs, sidewalks and ramps are installed per specifications. All construction work shall be fully completed by the Contractor with all punch-list items satisfactorily addressed and accepted by the City on **July 30, 2014**.

2. SUBSURFACE DATA (PART 4, DIVISION ONE, SUBSECTION 102.08)

Contractor shall bear all cost to repair any damage to existing utilities, including but not limited to storm, water, gas, power, and telecommunication facilities.

3. MAINTENANCE AND PERFORMANCE BOND

No Maintenance Bond is required, only a written one year warranty with similar terms is necessary. Landscaping is exempt from warranty and the City is to water trees. No performance bond is required.

PART 4

GENERAL REQUIREMENTS

TABLE OF CONTENTS

CITY OF NEWBERG PUBLIC WORKS GENERAL REQUIREMENTS

DIVISION ONE
GENERAL REQUIREMENTS

****

101 DEFINITIONS AND ABBREVIATIONS

****

Unless otherwise defined in the Contract Documents the following definitions and abbreviations shall apply wherever used. The words directed, required, permitted, ordered, requested, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory, or words of like import, refer to actions, expressions, and prerogatives of the Engineer. Command type sentences are used but are not exclusive of other directives, throughout these Technical Requirements. In all cases the command expressed or implied is directed to the Contractor. The requirements contained herein are divided into categories: (1) Division; (2) Section; and (3) Subsection, and are designated as in the following example:

(1) Division:	**DIVISION ONE – GENERAL TECHNICAL REQUIREMENTS**	
(2) Section:	**105**	**CONTROL OF WORK**
(3) Subsection:	**105.07**	**PROTECTION OF SURVEY MARKERS**
	OR	
	105.07A	**Permanent Survey Markers**

In Division 1 - General Requirements paragraphs under subsections are alphabetical with subparagraphs numbered (1), (2), etc.

101.01 DEFINITIONS

Acceptance of Work
All work required by the Contract Documents will be considered accepted upon approval of the Certificate of Completion by Owner.

Acts of God
An act of God is to be construed to mean an earthquake, flood, cloudburst, tornado, hurricane or other phenomenon of nature of catastrophic proportions or intensity.

Advertisement
The public announcement inviting bids for work to be performed or materials to be furnished.

Attorney
The City Attorney of the City of Newberg, Oregon.

Bid
The offer of a bidder, titled Proposal, which is the basis of the Contract, submitted on Owner's official Bid form, to perform stated work at a price or prices quoted.

Bid Bond
The bond required to be submitted with each Bid as described in Subsection 102.06 as a Bid Guaranty, which assures that the bidder will enter into a contract if his bid is accepted, synonymous with bid security.

Bidder
Any individual, firm, co-partnership, corporation, or combination thereof, submitting a Bid in response to the advertisement calling for bids on the work contemplated in the Contract.

Business Day
Definition is the same as for 'Working Day'.

Certificate of Completion
Standard Owner's form which must be signed by the Contractor.

Certificate of Compliance
Standard Owner's form that must be signed by the Contractor stating compliance with the Contract Documents.

Change Order
A written order issued by the Engineer to the Contractor directing changes in the work, subject to approval of Owner.

Contract Cost
The aggregate amount of price promised to be paid by Owner to Contractor upon fulfillment of the Contract.

Contract
The document entitled contract or agreement which is executed by the Contractor and the Owner, authorizing ordinance, the advertisement calling for bids, the bid, instructions to bidder, plans, all specifications, addenda, permits, performance bond, payment bond, insurance certificates, and change order for any approved revisions made during the performance of the work to any of the above listed documents, collectively referenced as the contract documents.

Contract Item
A specific unit of work for which a price or basis of payment is provided in the Contract.

Contractor
Any individual, firm, co-partnership, corporation or any combination thereof who has or have entered into a Contract with the Owner for a particular project. In the case of work being done under permit issued by the Owner, the permittee shall be construed to be the Contractor.

Day
Calendar day, any and every day shown on the calendar, Sundays and Holidays included.

Design Engineer
The Engineer of Record for the Project.

Easement
The right to use a defined area of property for specific purpose or purposes as set forth in the specifications.

Engineer
The City Engineer and/or the City Public Works Director of the City of Newberg acting either directly or through authorized representatives.

Emergency
Event affecting the safety or protection of persons, the work, or property at the site or adjacent thereto for which the Contractor is obligated to act to prevent threatened damage, injury or loss.

Foreign Contractor
Contractor who is not domiciled in or registered to do business in the State of Oregon.

Holidays

The following shall be recognized as legal holidays: New Year's Day, Martin Luther King Jr.'s Birthday, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day. City Hall also closes on the Day-After Thanksgiving and Christmas Eve.

Improvement
General term encompassing all phases of work to be performed under a Contract and is synonymous with the term Project or Work. It may refer to work for a Local Improvement District.

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

Lump Sum
A method of payment providing for one all-inclusive payment for the work described to be done, complete and accepted without further measurement, as such work is covered under the applicable lump sum pay item.

Manager
The City Manager of the City of Newberg acting either directly or through authorized representatives.

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

OSHD Standard Drawings and Standard Details
The latest edition of the Drawings and Details published by the State of Oregon entitled Oregon Standard Drawings and Oregon Standard Details, Oregon State Highway Division. This document is available online at: www.oregon.gov/ODOT/HWY/ENGSERVICES/standard_drawings_home.shtml or from the Oregon State Highway Division, Salem, Oregon.

OSHD Standard Specifications
The latest edition of the Specification Document published by the State of Oregon entitled Standard Specifications for Highway Construction, Oregon State Highway Division. This document is available online at: www.oregon.gov/ODOT/HWY/SPECS/index.shtml or from the Oregon State Highway Division, Salem, Oregon.

Owner
The City of Newberg, acting through its legally constituted City Council.

Payment Bond
The bond submitted by the Contractor and his surety as specified in the Contract and as more fully described in Subsection 103.06.

Performance Bond
The bond submitted by the Contractor and his surety as specified in the Contract and as more fully described in Subsection 103.06.

Plans
The official plans, profiles, cross sections, elevations, details and other working, supplementary and detail drawings, or reproductions thereof, signed by the Engineer, which show the location, character, dimensions and details of the work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.

Prequalification
Process for pre-screening Contractors.

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

Project Manager
A Project Engineer who manages the project from construction to completion after the award of the Contract.

Proposal
See Bid.

Provide
When related to an item of work, the word “provide” shall be understood to mean furnish and install the work complete in place that meets all required acceptance tests. “Provide” is synonymous with “install”.

Reference Specifications
Bulletins, standards, rules, methods of analysis or test, codes and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. All such references specified herein refer to the latest edition thereof, including any amendments thereto which are in effect and published at the time of advertising for bids or of issuing the permit for the project.

Responsible and Responsive Bidder
This term denotes a bidder who has the capability in all respects to perform fully the contract, and the integrity and reliability which will assure good faith performance and who has submitted a bid under a competitive sealed bid which conforms in all respects to the invitation for bids so that all bidders may stand on equal footing with respect to method and timeliness of submission and as to the substance of any resulting contract.

Right-of-Way
A general term denoting public land, property, or interest therein, acquired for or devoted to a public street, public access or public use.

Roadway
That portion of a street and its appurtenances between curbs, gutters, or ditches, primarily used for vehicular traffic.

Shop Drawings and Submittals
Supplementary plans or data or other information that the Contract requires the Contractor to submit to the Engineer.

Shown
As used herein, the word shown, or as shown, shall be understood to refer to work shown on the plans in the Contract.

Special Provisions
Definition is the same as for ‘Special Specifications’.

Special Specifications
Requirements peculiar to the project and changes and modifications of the Standard Specifications.

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

Standard Plans or Drawings
Details of structures, devices, or instructions adopted by Owner as a standard and referred to in the Contract.

Standard Specifications
The terms, directions, provisions and requirements set forth herein.

Station
A distance of 100 feet measured horizontally along the established centerline of a street, sewer, or other work, unless specified otherwise.

Street
Any street, avenue, boulevard, alley, lane, bridge, bicycle path, road, public thoroughfare or public way and any land over which a right-of-way has been obtained or granted for any purpose of public travel.

Subcontractor
An individual, firm, co-partnership, corporation, or combination thereof, to which the Contractor sublets part of the Contract.

Substantial Completion
The work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer, it is sufficiently complete in accordance with the Contract Documents, so that the work (or specified part) can be utilized for the purposes for which it is intended. Typically substantial completion means completion of curb, pavement and striping, and utilities under curb and payment.

Surety
The corporate body which is bound with and for the Contractor, for the acceptable performance of the Contract, and for his payment of all obligations arising out of the Contract.

Unit Price
A Contract item of work providing for payment based on specific unit of measurement; e.g., linear foot or cubic yard.

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

Utility
Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, owned, operated or maintained in or across a public right-of-way or easement.

Work
All material, labor, tools, equipment, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract, and such additional items not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure.

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

101.02 ABBREVIATIONS

AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil 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
BOLI	Bureau of Labor and Industries
CRSI	Concrete Reinforced Steel Institute
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
ITE	Institute of Traffic Engineers
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NLMA	National Lumber Manufacturer's Association
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Administration
OSHD	Oregon State Highway Division
PCA	Portland Cement Association
UBC	Uniform Building Code
UL	Underwriters' Laboratories, Inc.
USASI	United States of America Standards Institute
WWPA	Western Wood Products Association

****

102 INSTRUCTIONS TO BIDDERS

****

102.01 EEO AFFIRMATIVE ACTION

Bidders must comply with all State and Federal Equal Opportunity Policies for Contractors.

102.02 PREQUALIFICATION OF BIDDERS

All bidders must be prequalified. Prequalification forms must be submitted on the forms prescribed by the State of Oregon, Department of Administrative Services. Prequalification applications submitted without being designated for a project advertised for bid by the Owner will be considered as a general prequalification application and processed pursuant to ORS 279C, and notice of prequalification status will be given within thirty (30) days of the receipt of the application. A notice of disqualification can be given orally. An oral disqualification notice will be followed by written notice and bear the date of the oral notice.

102.03 FORM OF BID

A. Bidders shall enclose the bid, bid bond, certified check or cashier's check in a sealed, labeled, and addressed envelope and file as required in the Notice to Contractors-Invitation to Bid. The outside of the envelope should plainly identify: the Project name and the Bid Opening date.

B. All bids must be clearly and distinctly typed or written with ink or indelible pencil and be on the form furnished by Owner, and in addition to necessary unit price items and total prices in the column of totals to make a complete bid, all applicable blanks giving general information must be filled in and the bid signed by the Contractor or a duly authorized agent. Any statement accompanying and tending to qualify a bid may cause rejection of such bid, unless such statement is required in a bid embracing alternative bids.

C. Unless otherwise specified, bidders shall bid on all bid items included in the bid and the low bidder shall be determined as noted in Subsection 103.01, AWARD OF CONTRACT. Except as provided herein, bids that are incomplete, or fail to reply to all items required in the bid may be rejected.

D. State whether business is being done as an individual, a co-partnership, a corporation, or a combination thereof, and if incorporated, in what state, and if a co-partnership, state names of all

partners. The person signing on behalf of a corporation, a co-partnership or combination thereof shall state his position with the firm or corporation, and state whether the corporation is licensed to do business in the State of Oregon.

102.04 WITHDRAWAL, MODIFICATION OR ALTERATION OF BID

A. A bid may only be withdrawn on written or telegraphic request of the bidder and received by the Owner prior to the scheduled closing time for filing bids.

B. Prior to Bid Opening, changes may be made provided the bidder or his agent initials the change. If the intent of the bidder is not clearly identifiable, the interpretation most advantageous to Owner will prevail.

C. Any statement accompanying or tending to qualify a bid may cause rejection of such bid, unless such statement is required in a bid embracing alternate bids.

102.05 LATE BIDS

Bids received after the scheduled closing time for filing bids, as set forth in the invitation to bid will be rejected and returned unopened to the bidder unless such closing time is extended by Owner.

102.06 BID GUARANTY AND ORGANIZATION

Unless covered by an annual bid bond, filed with the Owner, in an unencumbered amount sufficient to cover all pending bids, all bids must be accompanied by a Bid guaranty guaranteeing that the bid will be irrevocable for 60 days, unless specified otherwise, in the form of a certified check, cashier's check payable to the order of the Owner, irrevocable letter of credit issued by an institution as defined in ORS 706.008, or a bidder's bond in such form as is approved by the City Attorney in an amount of at least ten percent (10%) of the amount of the bid. Such bid guaranty shall be forfeited as liquidated damages if the bidder shall fail or neglect to furnish a performance bond, payment bond, and insurance, if required, and to execute and return the contract within ten days (10) days after Notice of Award.

102.07 INTERPRETATION OF CONTRACT AND ADDENDA

A. If it should appear to a bidder that the work to be done or matters relative thereto are not sufficiently described or explained in the Contract Documents or that Contract Documents are not definite and clear, or the bidder requests additional information or an interpretation of the contract, the bidder may make written inquiry regarding same to the Engineer at least five (5) days before the scheduled closing time for filing bids.

B. If, in the opinion of the Engineer, additional information or interpretation is required, an addendum will be issued to all known specification holders.

C. Any addendum or addenda issued by the Owner which may include changes, corrections, additions, interpretations or information, and issued forty-eight (48) hours or more before the scheduled closing time for filing bids, Saturday, Sunday and legal holidays not included, shall be binding upon the bidder. Owner shall supply copies of such addenda to all Contractors who have obtained copies of the Contract for the purpose of bidding thereon, but failure of the Contractor to receive or obtain such addenda shall not excuse him from compliance therewith if he is awarded the contract.

ORAL INSTRUCTIONS OR INFORMATION CONCERNING THE CONTRACT OR THE PROJECT GIVEN OUT BY OFFICERS, EMPLOYEES OR AGENTS OF THE OWNER TO PROSPECTIVE BIDDERS SHALL NOT BIND THE OWNER.

102.08 EXAMINATION OF CONTRACT, SITE OF WORK AND SUBSURFACE DATA

A. Bidders shall determine for themselves all the conditions and circumstances affecting the project or the cost of the proposed work, including without limitation utility interferences, by personal examination of the site, careful review of the Contract and by such other means as the bidder feels may be necessary. It is understood and agreed that information regarding subsurface or other conditions, or obstructions indicated in the Contract Documents, is provided by Owner only for the convenience of bidders and such information is not expressly or tacitly warranted to accurately represent actual conditions. Bidder's use of such information shall be at bidder's sole risk, and bidder is responsible to confirm any information provided from such independent sources as bidder feels may be necessary.

B. Logs of test holes, test pits, soils reports, ground-water levels and other supplementary subsurface information are offered as information of underlying materials and conditions at the locations actually tested. Owner will not be liable for any loss sustained by the Contractor as a result of any variance between conditions contained in or interpretations of test reports and the actual conditions encountered during progress of the work.

C. The submission of a Bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the site subsurface conditions to be encountered, as to the character, quality and quantities of work to be performed and materials to be furnished, and as to the requirements of the Contract.

102.09 FAMILIARITY WITH LAWS AND ORDINANCES

The bidder is presumed to be familiar with all Federal, State, and local laws, ordinances, and regulations which in any manner affect those engaged or employed in the work or the materials or equipment used in the proposed construction, or which in any way affect the conduct of the work. If the bidder, or Contractor, shall discover any provision in the Contract which is contrary to or inconsistent with any law, ordinance or regulation, he shall immediately report it to the Owner in writing.

102.10 UNIT BIDS

A. The estimate of quantities of work to be done under unit price bids is approximate and is given only as a basis of calculation for comparison of bids and award of the Contract. The Owner does not warrant that the actual amount of work will correspond to the amount as shown or estimated. Payment will be made at unit prices under a contract, only for work actually performed or materials actually furnished according to actual measurement.

B. Bidders must include in their bid prices the entire cost of each item of work set forth in the bid, and when, in the opinion of the Owner, the prices in any bid are obviously unbalanced, such bid may be rejected.

C. The unit contract prices for the various bid items of the contract shall be full compensation for all labor, materials, supplies, equipment, tools and all things of whatsoever nature required for the complete incorporation of the item into the work the same as though the item were to read "In Place."

102.11 REJECTION OF BIDS

A. Owner reserves the right to reject any or all bids in whole or in part or waive irregularities.

B. This invitation to bid does not commit the Owner to pay any costs incurred by any bidder in the submission of a proposal, or in making necessary studies or designs for the preparation thereof, or for procuring or contracting for the items to be furnished under the invitation to bid.

102.12 CONFLICT OF INTEREST

A bidder filing a bid thereby certifies that no officer, agent, or employee of the Owner who has a pecuniary interest in this bid has participated in the contract negotiations on the part of the Owner, that the proposal is made in good faith without fraud, collusion, or connection of any kind with any other bidder for the same call for bids, and that the bidder is competing solely on its own behalf without connection with, or obligation to, any undisclosed person or firm.

102.13 INELIGIBILITY FOR PUBLIC CONTRACTS-FAILURE TO PAY PREVAILING RATE OF WAGE

The bidder, in submitting the bid, does thereby certify that the bidder is not ineligible to receive a contract for a public work, as set forth in ORS 279C.800 to 279C.870 and agrees, if awarded a contract, that every subcontractor will be required to certify compliance thereto, said certification to be filed with the Engineer prior to such subcontractor commencing any work under the contract.

102.14 ORS 654.150 SANITARY FACILITIES AT CONSTRUCTION PROJECTS STANDARDS, EXEMPTIONS

If the contract price is estimated (itemized bid) or bid (lump sum) by Contractor at $1,000,000 or more, Contractor shall be responsible for all costs (which costs shall be included in the bid whether or not a specific bid item is provided therefore) that may be incurred in complying with or in securing exemption or partial exemption from the requirements of ORS 654.150, (Sanitary facilities at construction projects; standards, exemptions) and the rules adopted pursuant thereto. Whether or not ORS 654.150 is applicable to the project is the sole responsibility of the Contractor.

102.15 ORS 279C.370 SUBCONTRACTORS, SUPPLIERS AND OTHERS

A. Within 2 hours after the time of filing the bid, the bidder shall submit to the Owner, the disclosure form included in the bid documents of any first-tier subcontractors that will be furnishing labor or materials in connection with this project if the subcontract value is equal to or greater than a) five percent (5%) of the total project bid or $15,000, whichever is larger or b) $350,000, regardless of the percentage of the total project bid. If the required disclosure is not submitted with the 2-hour period, the bid will be rejected as non-responsive.

B. Refer to ORS 279C.585 for provisions relating to substitution of a first-tier subcontractor not included in the disclosure.

102.16 PREVAILING WAGE RATES

A. The Contractor will be responsible to pay, as required in the provisions of ORS 279C.800-870, the current prevailing wage rates as specified in the Technical Requirements Section 107.09 paragraph B.8. The Contractor shall ensure that the wage rates in effect as required by the requirements of BOLI have been used for this project. All work, including repair work during the warranty period, shall be completed using the prevailing wage rates. The Contractor must use the BOLI certified payroll report (Form WH-38) complying with ORS 279C.845.

B. The existing prevailing rate of wage is that rate which is in effect at the time the project was first advertised for bid solicitation. If during the bidding process the prevailing wage rate changes, the Owner retains the option to amend the contract to reflect such change.

****

103 AWARD AND EXECUTION OF CONTRACT

****

103.01 AWARD OF CONTRACT

A. The award will be made by Owner to the bidder submitting the lowest, responsible and responsive bid. In determining the lowest acceptable bid, Owner may take into account, among other factors, the prices bid, discounts, if any, time of completion or delivery proposed, as between equal bids, the relative merits and performance of any item specifically proposed by the bidder, any variation in maintenance and guaranty period specially proposed by the bidder in excess of any minimums specified, the realistic balance of prices in the bids for various parts or units of work and the experience and ability of bidder to perform the work.

B. While price extensions are required as a matter of convenience, in the event of error in extensions, the unit prices bid shall govern. In the event of discrepancy between the written and numerical amounts, the written prices will govern.

C. Determination of the lowest bidder and award are subject to review and determination by the Attorney as to legal sufficiency of any bid submitted.

D. Award and tender of contract, if it be awarded, shall be made within sixty (60) calendar days, unless otherwise specified, after the date of opening of bids.

103.02 EXECUTION OF CONTRACT

The bidder agrees that if this bid is accepted, he will, within ten calendar days after notification of acceptance, execute the contract with the Owner, and will at that time deliver to the Owner the performance bond, payment bond and insurance documents required herein, and will, to the extent of his bid, furnish all labor, equipment and materials necessary to complete the work in the manner, in the time, and according to the methods as specified in the contract documents and required by the Project Manager.

103.03 FAILURE TO EXECUTE CONTRACT

Failure on the part of the bidder to whom the Contract is awarded to execute the Contract and to deliver the Contract and required performance bond, payment bond and insurance as provided for in Subsection 103.02 shall be just cause for cancellation of the award, withdrawing tender of the Contract and forfeiture of the Bid Guaranty to Owner. The forfeited Bid Guaranty shall become property of the Owner, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible and responsive bidder, or the work may be re-advertised, or otherwise, as the Owner may decide.

103.04 RETURN OF BID GUARANTY

Upon the execution of the contract and bonds by the successful bidder, the bid guaranty shall be returned. The bidder who is awarded a contract and who fails promptly and properly to execute the contract and bonds shall forfeit the bid guaranty that accompanied the bid. The bid guaranty of unsuccessful bidders will be returned after the bids have been opened and the contract has been awarded, and shall not be retained after the contract has been duly signed. The Owner reserves the right to retain the bid security of the three (3) lowest bidders until the award contract has been signed and returned.

103.05 TRANSFER OF CONTRACT AND INTERESTS THEREIN

A. Excepting Surety assignment under the performance and payment bonds, the Contract is not assignable to any other party or parties without the prior written consent of Owner. In case of such attempted transfer without permission, Owner may refuse to carry out the Contract either with the transfer or the transferee, but all rights of action for any breach of the Contract by said Contractor are reserved to the Owner. No officer or Owner, nor any person employed in its service is or shall be permitted any share or part of the Contract or is or shall be entitled to any benefit which may arise from the contract.

B. Any assignment of money shall be subject to all proper setoffs and withholdings in favor of Owner and to all deductions provided for in the Contract, and particularly all money withheld, whether assigned or not, shall be subject to being used by Owner for completion of the work in the event Contractor should be in default therein.

103.06 PERFORMANCE AND PAYMENT BONDS

Pursuant to ORS 279C.380 and OAR 137-049-0460, at the time of execution of the Contract, the Contractor shall furnish a performance bond and a payment bond approved by the Owner and Attorney. Each bond shall be in an amount equal to the amount of the Contract based upon the estimate of quantities or lump sum as set forth in the Proposal, conditioned upon a compliance with and fulfillment of

all terms and provisions of the Contract, including repair and replacement, and all applicable laws and prompt payment, as due, to all persons supplying labor and/or material for prosecution of the work.

103.07 PROOF OF CARRIAGE OF INSURANCE

Work shall not commence until all insurance required in the contract has been obtained and a certificate thereof has been approved by the Attorney. Contractor shall maintain insurance throughout the life of the Contract which will hold Owner and Design Engineer harmless and shall indemnify Owner and Design Engineer for any and all losses to third persons or to Owner arising out of the operations, including any contingent liability arising there from.

103.08 NONRESIDENT BIDDER

The Owner shall give preference to goods or services that have been manufactured or produced in this state if price, fitness, availability and quality are otherwise equal per ORS 279A.120.

****

104 SCOPE OF WORK

****

104.01 PLANS AND SPECIFICATIONS

The Contract Documents will govern the work to be done. Anything mentioned in the Specifications and not shown on the plans and detailed drawings, or shown on the plans and detailed drawings and not mentioned in the Specifications, shall be of like effect as though shown or mentioned in both. Specifications and plans referred to in any of the Contract Documents shall be considered as being included in the document in which such reference is made. When a particular Standard Plan or Specification is referred to, such reference shall be to the Standard Plan or Specification which is in force at the time of advertising for bids. The phrases, "Contractor shall", "Contractor will", etc. may not always be specifically stated in all paragraphs but is considered understood where not specifically stated otherwise.

104.02 PRECEDENCE OF CONTRACT DOCUMENTS

In case of conflict, the order of precedence of the following documents in controlling the work shall be:

1. Contract
2. Addenda
3. Bid
4. Permits from outside agencies required by law
5. Special Specifications (Provisions)
6. Plans
7. Standard Plans and Standard Details
8. Standard/Technical Specifications

Change orders, supplemental agreements and approved revisions to plans and Specifications will take precedence over Contract Documents listed above.

104.03 SHOP DRAWINGS AND OTHER SUBMITTALS

A. plans furnished and included with Specifications indicate the work proposed and the results that are intended to be accomplished.

B. Unless otherwise specified, furnish six (6) copies of all layout, detail, shop and working drawings requested by the Engineer. Shop drawings shall be of sufficient size and scale to clearly show details. After review and approval by the Engineer, two copies will be returned to the Contractor.

C. By approving and submitting shop drawings, product data and samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the work and of the Contract Documents and that he has checked and coordinated the information contained within such submittals with the requirements of the work and of the contract documents and that he is satisfied they conform to the contract documents.

D. All required shop drawings, product data and samples shall be furnished to the Engineer for his review and any required testing before any of the work or related work is performed or products or material ordered prior to the Engineer's review and completion of any testing will be at Contractor's risk.

E. The Engineer will review all shop drawings, product data and samples and conduct such tests as are required by the contract documents within a reasonable time but in no event will Engineer be required to complete such review or conduct such tests in less than fourteen (14) days after submission. The Engineer will return marked-up submittal copies indicating one of the following actions:

1. If review and checking indicate no exceptions, copies will be returned marked "NO EXCEPTIONS TAKEN" and work may begin immediately on incorporating the material or equipment covered by the submittal into the work.

2. If review and checking indicate limited corrections are required, copies will be returned marked "MAKE CORRECTIONS NOTED," and upon making the corrections noted, work may begin immediately to incorporate the material or equipment covered by the submittal into the work.

3. If review and checking indicate insufficient or incorrect data have been submitted, copies will be returned marked "REVISE AND RESUBMIT." No work may begin on incorporating the material or equipment covered by this submittal into the work until the submittal is revised, resubmitted, and returned marked either "NO EXCEPTIONS TAKEN" OR "MAKE CORRECTIONS NOTED."

4. If review and checking indicate the material or equipment submittal is unacceptable, copies will be returned marked "REJECTED." No work may begin on incorporating the material or equipment covered by this submittal into the work until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" OR "MAKE CORRECTIONS NOTED."

5. If review and checking indicate additional information is required, copies will be returned marked "SUBMIT SPECIFIED ITEM." Work may begin immediately on incorporating the material or equipment covered by the submittal into the work, only if it is not affected by the item to be submitted. If any material or equipment is affected, no work may begin on incorporating that material or equipment into the work until it and the submittal are submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

F. The review by the Engineer of any shop drawings, product data, samples, construction methods and equipment or other submittals is only for conformance with the general design concept of the project and does not extend to consideration of structural integrity, safety, detailed compliance with contract requirements, or any other obligation of the Contractor. Any action shown is subject to the requirements of the plans and specifications. The Contractor is responsible for confirming and correlating all dimensions; fabricating and construction techniques; coordinating his entire work in strict accordance with the contract documents. The review does not relieve Contractor from his obligation fully to perform all contract requirements, nor shall such review give rise to any right of action or suit in favor of Contractor or third persons, against Engineer or Owner.

104.04 CHANGES IN THE WORK

A. Without invalidating the Contract and without notice to a surety by the Owner, Owner may, at any time, order additions, deletions or revisions in the Work: these will be authorized by a written amendment, a Change Order, or a work change directive.

B. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

104.05 FORCE ACCOUNT WORK

A. The Contractor shall perform work on a force account basis upon written notice by the Engineer. If the Engineer determines the work increases the amount due under the Contract, payment will be made pursuant to Subsection 109.04 A 3 Method 3 FORCE ACCOUNT WORK.

B. The Contractor must maintain records in such a manner as to provide a clear distinction between direct cost of work performed on force account basis and costs of all other operations performed in connection with the Contract.

C. Daily, furnish to Engineer signed reports itemizing materials used and setting forth the cost of labor and charges for equipment rental, delineating whether said equipment is Contractor or Subcontractor owned. Provide names, identifications, and classifications of workmen, the hourly rate of pay and hours worked, and the size, type, and identification number of equipment and hours of equipment operation.

D. Substantiate material charges by vendor's invoices, submit such invoices with the reports; or, if not available, submit with subsequent reports. In the event said vendor's invoices are not submitted within 30 days after completion of the force account work, Owner reserves the right to establish the cost of such materials.

E. The Engineer will compare his records with the reports furnished by the Contractor, make any necessary adjustments, compile the costs of work paid for on a force account basis and issue a change order covering the work.

104.06 SALVAGE

A. When shown or specified, carefully salvage and stockpile within the construction area all castings, pipe and any discarded facilities, to be disposed of by Owner.

****

105 CONTROL OF WORK

****

105.01 AUTHORITY OF THE ENGINEER

A. The Engineer will decide all questions which may arise as to quantity, quality, and acceptability of materials furnished and work performed the rate of progress of the work; interpretation of the plans and Specifications; the measurement of all quantities; and the acceptable fulfillment of the Contract on the part of the Contractor. The Engineer's estimates, decisions and approval signify favorable opinion and qualified consent; it does not carry with it certification or assurance of completeness, quality or accuracy concerning details. Such approval does not relieve Contractor from responsibility for errors, improper fabrication, improper construction methods, non-conformance to requirements or for deficiencies within his control.

B. It is further understood that all work to be done under the Contract will not be considered completed until it has passed final inspection by the Engineer and is accepted by the Owner. It is further understood that the authority of the Engineer is such that the Contractor shall at all times carry out and fulfill the instructions and directions of the Engineer insofar as they concern the work to be done under the Contract.

C. The Engineer shall have the authority to order unacceptable work to be corrected, removed or replaced, and unauthorized work to be removed and, pending completion of such order, to deduct the estimated cost thereof from any monies due, including retainage, or to become due the Contractor. This authority shall take precedence over any and all requirements of the specifications for payment set forth elsewhere in the specifications.

D. In the Engineer's sole discretion, minor defects in the work may be accepted subject to a reasonable deduction from the Contract price or other credits to the Owner. Such determination by Engineer shall be final.

E. The Engineer is not authorized to waive any written notice required of the Contractor by the Contract.

105.02 AUTHORITY AND DUTIES OF INSPECTORS

A. Engineer may appoint assistants to inspect all materials used and all work done. Such inspection may extend to any or all parts of the work and to the preparation or manufacture of materials to be used. Inspectors will not be authorized to revoke, alter, enlarge, or relax the provisions of the contract. An Inspector is placed on the work to keep the Engineer informed of progress of the work and the manner in which it is being done. In addition, the Inspector shall call to the attention of Contractor any deviation from the plans, or Specifications.

B. An Inspector will not be authorized to approve or accept any portion of the work or to issue instructions contrary to the plans and Specifications under this Contract. Furthermore, the Inspector is not authorized to waive any written notices required by the Contract. The Inspector will have authority to reject defective material and to suspend any work that is being improperly done, subject to final decision by the Engineer.

105.03 RESPONSIBILITY OF CONTRACTOR

A. Do all work and furnish all labor, materials, equipment, tools, and machines necessary for the performance and completion of the project in accordance with the Contract. Be obligated to determine and be responsible for the method of construction.

B. Contractor shall be solely liable for any accident, loss or damage happening to work referred to in the Contract prior to completion and acceptance thereof.

C. Contractor shall have at least one worker certified by OSHA with a “Competent Person Training” on project site while work is in progress.

105.04 NOTIFICATION OF UTILITIES AND AGENCIES

A. Obtain prior approval from the Engineer for closing or partial closing of any street. Give at least two (2) business days advance notice of such closure to all agencies providing emergency services, including without limitation Newberg-Dundee Police, Newberg fire and ambulance services, and also U.S. postal service. Notification shall include, but not be limited to the time of commencement and completion of work, names of streets or location of alleys to be closed, or partially closed, schedule of operations and routes of detours where applicable. Accommodate uninterrupted emergency services to all residents.

B. When performing work in streets and easements, whether inside or outside Owner's legal boundaries, notify all of the affected utilities and local agencies about the operations so as to properly coordinate and expedite the work in such a manner as to cause the least amount of conflict and interference between the operations and those of other agencies.

C. The Contractor and its subcontractors must comply with all provisions of ORS 757.541 to 757.571 including notification of all Owners of underground facilities at least forty-eight (48) business day hours but not more than ten (10) business days before beginning work. Notify the following utilities and agencies in writing at least two business days before commencing any work on the project:

One Call Locating Services	800-332-2344
Locating, Inc.	503-255-4634
City of Newberg, Public Works Maintenance Division	503-537-1234
Yamhill County Public Works	503-434-7515
First Student (Newberg School District)	503-538-8365
Frontier Communications Corporation	503-526-3544
Comcast Cable Service	541-753-1655
Northwest Natural Gas Co.	503-226-4211
Portland General Electric Company	503-463-4325
PGE – Street Lights	503-463-5139

D. Owner shall relocate or cause to be relocated all privately or publicly owned utility conduits, lines, poles, mains, pipes and such other facilities within the jurisdiction and control of Owner where such relocation is necessary in order to conform said utility and other facilities with the plans and ultimate requirements of the project. If desirable for specific reasons, or for convenience of field operations, contact the above listed utilities.

105.05 UTILITIES AND EXISTING IMPROVEMENTS

A. Information shown as to location of existing water courses, drains, sewer lines or utility lines is provided for Contractor's information and convenience and is not, in any way, warranted to be accurate by Owner. Contractor shall verify all such information and shall deal with varying conditions at its own expense.

B. Operation of water valves and hydrants by unauthorized personnel is strictly prohibited. Obtain written permission from and pay any fee required from the City of Newberg prior to using hydrant water.

C. Provide for the flow of sewers, drains, or water courses interrupted during the progress of the work, and restore such drains or water courses as approved by the Engineer, at no additional cost to Owner.

D. Be responsible for all costs for the repair of any and all damage to any utility, whether previously known or disclosed during the work, as may be caused by the work. Maintain in place utilities not shown on the drawings to be relocated or altered by others. If Contractor requires temporary relocation, for his convenience or because of his method of construction or as a result of site conditions, Contractor shall bear all costs for said temporary relocation. Maintain utilities which have been relocated by others in their relocated positions in order to avoid interference with structures which cross the project work.

E. Make excavations and borings ahead of work, as necessary, to determine the exact location of interfering utilities or underground structures. When this is not feasible or practical or the need for such work was not foreseen, the utility Owners or the Owner shall have the right to enter upon the right-of-way and upon any structure therein for the purpose of making new installations, changes or repairs. Conduct operations so as to provide the time needed for such work to be accomplished during the progress of the improvement, at no additional cost to the Owner.

F. It is understood that there will be interfering utilities, service laterals, and other underground pipes, drains or structures encountered on underground projects that are not shown or are shown incorrectly on the plans and/or have not been previously discovered in the field. Contractor agrees this is a normal and usual occurrence in the construction of underground improvements. Furthermore, bidders understand and agree that work in some cases must be done in close proximity to said utilities and underground pipes, drains, and structures not shown or shown incorrectly on the plans which may require a change in operations and may cause sloughing of the trench, additional traffic control, additional pavement and backfill costs, and time; the Contractor agrees that a reasonable number of these occurrences are usual and ordinary on underground projects and are reflected in the bid and plan of operation.

G. The Engineer will require a reasonable amount of time to perform design changes necessitated by directly conflicting utilities and/or the utility Owners will require a reasonable amount of time to make necessary utility relocations.

H. The bidders agree to provide for these conflicts and interferences and agree to provide for a reasonable amount of time for design changes and/or utility relocations due to said interference in the bid and understand that no additional compensation for interruption of schedule, extended overhead, delay or any other impact claim or ripple effect or any other costs whatsoever or additional time will be made for these conflicts or interferences.

105.06 SURVEY SERVICE

A. Engineer will furnish and set two reference points shown on the design drawings for Contractor's use. Engineer requires 10 days notice prior to staking these control points.

B. Contractor shall layout the work based on these control points and the coordinates on the drawings. Contractor layout staking shall include slope stakes for mass excavation and roadway construction, centerline and offset staking roadway and for buried utilities and as may be needed to accomplish the work.

C. Contractor shall check and establish exact location of existing facilities prior to construction of new facilities and any connection thereto. Work done without lines and grades having been established or work done beyond the lines and grades will be considered as unauthorized and will not be paid for and may be ordered removed, replaced or corrected at no expense to the Owner.

D. Contractor shall employ a registered land surveyor to:
1. Perform and check layout, survey and measurement work completed by others.
2. Maintain complete accurate log of survey work as it progresses as a record document.
3. Measure quantities for payment purposes.

105.07 PROTECTION OF SURVEY MARKERS

A. Permanent Survey Markers

Notify the Engineer not less than ten (10) business days prior to starting work in order that the Engineer may take necessary measures to ensure the preservation of all permanent survey monuments, markers and benchmarks. Contractor shall not disturb permanent survey monuments, markers, or benchmarks without the consent of Engineer and shall bear the expense of hiring a licensed land surveyor to replace any that may be disturbed.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, Contractor shall preserve the monument and adjust the monument cover to the new grade at no expense to Owner.

B. Construction and Survey Markers

Contractor shall preserve construction survey stakes and marks for the duration of their usefulness during construction. If any construction survey stakes are lost or disturbed through negligence of Contractor, and in the judgment of the Engineer need to be replaced, such replacement shall be at the expense of Contractor.

105.08 PROTECTION OF PROPERTY

A. Protect all public and private property, insofar as it may be endangered by operations and take every reasonable precaution to avoid damage to such property.

B. Restore and bear the cost of any public or private improvement, facility, structure, or land and landscaping within the right-of-way or easement which is damaged or injured directly or indirectly by or on account of an act, omission, or neglect in the execution of the work. Restore to a condition substantially equivalent to that existing before such damage or injuries occurred, by repairing, rebuilding, or otherwise effecting restoration thereof, or if this is not feasible, make a suitable settlement with the Owner of the damaged property.

C. Give reasonable notice to occupants of buildings on property adjacent to the work to permit the occupants to remove vehicles, trailers and other possessions as well as salvage or relocate plants, trees, fences, sprinkler systems, or other improvements in the right-of-way which are designated for removal or which might be destroyed or damaged by work operations.

D. Protect all designated trees, lawns and planted areas within the right-of-way or easements. Restore all on-surface disturbed areas, by methods as set forth in the Technical Requirements. If conditions are such that the method specified cannot be done, provide erosion control surface covering of such quality and quantity as will prevent erosion from occurring, without adverse impacts to the environment, if required by conditions existing at the site, at no additional cost to the Owner.

E. Review with Engineer the location, limits and methods to be used prior to clearing work. Clearing and grubbing shall be performed in strict compliance with all local, State and Federal laws and requirements pertaining to clearing and burning, and particularly in conformity with the provisions of ORS Chapter 477, and all subsequent amendments, which require, among other things, filing with the State Forester a general description of the right-of-way to be cleared before the start of clearing operations. Obtain the required permit from the State Forester and perform clearing work in conformance thereto.

105.09 USE OF WORK DURING CONSTRUCTION

A. Owner shall have the right to take possession of and use any completed or partially completed portions of the Work. Such use shall not be considered as final acceptance of the Work or portions thereof.

B. Such action by Owner will not relieve the Contractor of responsibility for injury or damage to said completed portions of the work resulting from use by public traffic, action of the elements, Contractor's operations, defective work, or negligence, or from any other cause, except for injury or damage resulting from Owner's negligence. Contractor will not be required to again clean up such portions of the Work prior to final acceptance, excepting for such clean up as results from Contractor's operations or defective work. Use of any completed or partially completed portions of the work does not relieve Contractor from the warranty responsibility nor shall the warranty period commence to run until final completion and acceptance of the work.

105.10 FURNISHING TEMPORARY SERVICES AND FACILITIES

Install, furnish and maintain temporary light, power, water and any temporary services or facilities complete with connecting piping, wiring, lamps, and similar equipment during construction of the work, including testing and start up. Remove temporary facilities upon completion of work. Obtain all permits and bear all costs in connection with temporary services and facilities. Conform to applicable statues, rules, codes, and other requirements in the use of these facilities.

105.11 VERBAL AGREEMENTS OR REPRESENTATIONS

No verbal agreement or conversation by or with any officer, agent or employee of the Owner, either before or after execution of the Contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the Contract. Any such verbal agreement or conversation is in no way binding upon Owner.

105.12 WATER AND AIR POLLUTION CONTROL

A. During the term of the Contract, Contractor's operations shall conform to applicable laws and regulations of the Oregon Department of Environmental Quality, and other agencies of the State and Federal government, City of Newberg guidelines, as well as other local Ordinances and Resolutions designed to prevent, control, and abate water and air pollution.

B. During all phases of the work, or when directed, protect work sites, storage and disposal areas from washout and erosion, and take precautions to control or abate dust nuisance and air pollution by cleaning up, sweeping, sprinkling, covering, enclosing or sheltering work areas, and stockpiles, and by promptly removing from paved streets earth or other material which may become airborne or may be washed into waterways or drainage systems.

105.13 NOISE

A. Conform and comply with applicable noise regulations of the City of Newberg.

105.14 ACCESS TO THE WORK

A. Provide access to the work for representatives of the Owner, the State of Oregon, the Federal Government, and other entities having jurisdiction in the area.

B. Allow access to Engineer or his representatives to all parts of the work and to plants of manufacturers at all times. Furnish them with every reasonable facility for ascertaining if the work meets requirements and intent of the Contract.

105.15 DEFECTIVE OR UNAUTHORIZED WORK

A. All work, which does not conform to the requirements of the Contract, shall be considered as unacceptable.

B. Upon discovery immediately remove unacceptable and defective work and replace by work and materials which conform to the Contract. This provision shall have full effect regardless of the fact that the unacceptable work may have been done or the defective materials used with the full knowledge of the Inspector.

105.16 RAILROAD CROSSINGS OR RIGHT-OF-WAY

Submit a schedule of proposed operations to the Engineer whenever the project or work thereunder involves the crossing of any railroad line or the encroachment on any railroad right-of-way. This schedule shall be approved by the appropriate railroad officials and the Engineer before the work is started within such area. Pay for services of flag persons and/or watch persons furnished by the railroad company and provide and drive piling, set cribbing, build bridges or tunnels, install enclosing pipe and do all other work required by the railroad company or necessary for safety or maintenance of railroad traffic, including working on weekends, holidays and providing extra shifts. Furnish any bonds or insurance required of the Owner by the railroad company as a result of such intended operations and indemnify Owner for any and all expenses incurred by Owner, and assume any and all liability or claims thereof imposed on Owner as a result of operations in railroad right-of-way area. Bear all costs resulting from interferences, obstructions or liabilities set forth in this Specification, whether or not herein specifically mentioned.

****

106 CONTROL OF MATERIALS

****

106.01 PREFERENCE FOR USE OF OREGON PRODUCTS

Preference may be given to services, articles or materials produced or manufactured in Oregon, if price, fitness, availability and quality are otherwise equal. These provisions do not apply to Contracts on projects financed wholly or in part by Federal funds.

106.02 QUALITY OF WORK

Materials, parts, products and equipment which are to be incorporated into the work shall be new and shall conform to the Contract Documents.

106.03 SAMPLING AND TESTING

A. Tests of the work may be made by Owner at any time during construction of the work or during the production, fabrication, or preparation and use of materials, parts, products and equipment.

B. Owner reserves the right to require samples and to test products for compliance with pertinent requirements irrespective of prior certification of the products by the manufacturer.

C. When such tests of the work are necessary, as determined by the Engineer, such tests will be made by and at the expense of Owner unless otherwise specified. Provide such facilities and cooperate as required for collecting and forwarding samples and do not incorporate into the work until tests have been made and found acceptable. In all cases furnish the required samples without charge and in ample time to permit testing prior to use. Provide safety measures and devices to protect those who take the samples.

D. In the absence of any reference specification it shall be understood that materials shall meet the Specifications and requirements of the American Society for Testing and Materials (ASTM), or the American Association of State Highway and Transportation Officials (AASHTO), as directed by the Engineer. When there is no pertinent coverage under ASTM or AASHTO, the material concerned shall meet Specifications and requirements of applicable Commercial Standards of the Commodity Standards Division of the U.S. Department of Commerce. Lacking such coverage, materials shall meet requirements established by reputable industry for a high-quality product of the kind involved.

E. All testing shall be performed by the testing laboratory or by the Engineer or as directed by the Engineer.

F. In the event Engineer requests tests, and the work fails, the Contractor shall bear all costs for all subsequent testing necessary to meet specified requirements.

106.04 CERTIFICATION

The Engineer in his sole discretion may in lieu of any other required sampling and testing accept from Contractor two copies of the manufacturer's certification with respect to the product involved, under conditions set forth as follows:

1. Certification shall state that the named product conforms to Owner's requirements and that representative samples thereof have been sampled and tested as specified.

2. Certification shall either be accompanied with a certified copy of test results, or certify that such test results are on file with the manufacturer and will be furnished to Engineer upon request.

3. Certification shall give the name and address of the manufacturer and the testing agency and the date of tests; and shall set forth the means of identification which will permit field determination of the product delivered to the project as being the product covered by the certification.

4. Contractor shall not be responsible for any costs of certification or for any costs of the sampling and testing of products in connection therewith.

106.05 INSPECTION BY OTHERS

Inspection of work by persons other than representatives of the Owner will not constitute inspection by Owner.

106.06 STORAGE AND PROTECTION OF ITEMS OF WORK

Store items to be incorporated into the work to assure the preservation of their quality and fitness for the work. Stored items, even though approved before storage, may be reinspected and are subject to rejection prior to being incorporated into the work. Stored items shall be located so as to facilitate their prompt inspection. Provide a safe buffer and delineation from pedestrian and traffic for all storage. Storage within public right-of-way is subject to approval from Owner or other governmental authority.

106.07 TRADE NAMES, EQUALS OR SUBSTITUTIONS

A. In order to establish a basis of quality, certain processes, types of machinery or equipment or kinds of materials may be specified either by description of process or by designating a manufacturer by name and referring to his brand or product designation or by specifying a kind of material. It is not the intent of these specifications to exclude other processes, equipment or materials of equal value, utility or merit.

B. Whenever a process is designated or a manufacturer's name, brand or item designation is given or whenever a process or material covered by patent is designated or described, it shall be understood that the words "or equal" follow such name, designation, or description, whether in fact they do so or not. This "or equal" clause is not a warrantee, either expressed or implied by Owner that an equal exists.

C. The Contractor may offer to furnish materials or equipment of equal or better quality and performance other than that specified as a substitute after the contract is executed. If the offer necessitates changes to or coordination with any other portion of the work, the data submitted shall include drawings and details showing all such changes. Contractor agrees to perform these changes as part of the substitution of material or equipment. Acceptance by the Engineer shall not relieve the Contractor from full responsibility for the efficiency, sufficiency, quality and performance of the substituted material or equipment in the same manner and degree as the material and equipment specified by name. Any cost differential associated with a substitution shall be reflected in the Contract price and the contract shall be appropriately modified by Change Order.

D. If the Bid includes a list of equipment, materials or articles for which Contractor must name the manufacturer at time of submission of the bid, no substitutions therefore will be permitted.

E. All materials or equipment of equal or better quality offered by the Contractor for substituting shall be approved by the Engineer prior to incorporation into the project.

****

107 LEGAL RELATIONS AND RESPONSIBILITIES

****

107.01 LAWS AND REGULATIONS

A. Comply with all Federal and State laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of work. Observe and comply with all such laws, ordinances, regulations, orders and decrees. Protect and indemnify Owner and his representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by Contractor, his subcontractors, suppliers of materials or services, or others engaged by the Contractor, or their employees.

B. In addition to those set forth herein, the Statutes of the State of Oregon for public works contracts, Chapter 279C, are incorporated by reference into the Contract.

107.02 SUBCONTRACTORS

A. After contract award and notice of Contractor/subcontractor agreements have been submitted, work shall not be transferred or subcontracted without prior consent of Owner.

B. Use of subcontractors, material suppliers or equipment suppliers shall in no way release Contractor from any obligations of contract with Owner.

C. Contractor will provide in all subcontract agreements that the Subcontractor, material supplier and equipment supplier will be bound by the terms and conditions of this Contract to the extent that they relate to the Subcontractor's work, material or equipment. All Subcontractor's agreements will also provide that they are assignable to the Owner at Owner's option, in the event this agreement is terminated for default of Contractor.

107.03 NO WAIVER OF LEGAL RIGHTS

Owner shall not be precluded or estopped by any measurement, estimate or certificate made either before or after completion and acceptance of work or payment therefore, from showing the true amount and character of work performed and materials furnished by the Contractor, or from showing that any such measurement, estimate or certificate is untrue or incorrectly made, or that work or materials do not conform in fact to the Contract. Owner shall not be precluded or estopped, notwithstanding any such measurement, estimate or certificate, or payment in accordance therewith, from recovering from the Contractor and his Sureties such damages as it may sustain by reason of his failure to comply with terms of the Contract, or from enforcing compliance with the Contract. Neither acceptance by Owner, or by any representative or agent of the Owner, of the whole or any part of the work, nor any extension of time, nor any possession taken by Owner, nor any payment for all or any part of the project, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or any right to damages herein provided. A waiver of any breach of the Contract shall not be held to be a waiver of any other breach.

107.04 OTHER CONTRACTS

A. The Owner reserves the right to award other contracts or issue permits for work that may require coordination with the work to be performed under this contract.

B. When separate contracts or permits are awarded or issued for different portions of the Project, "the Contractor" in the contract documents in each case shall be the Contractor who signs each separate contract.

C. Mutual Responsibility of Contractors - The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate his Work with theirs.

D. If any part of the Contractor's Work depends for proper execution or results upon the work of any other separate Contractor, the Contractor shall inspect and promptly report to the Engineer any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor to inspect and report shall constitute an acceptance of the other Contractor's work as fit proper to receive the Work, except as to defects which may develop in the other separate Contractor's work after the execution of the Contractor's Work.

E. Should the Contractor cause damage to the work or property of any separate Contractor which results in a claim against the Owner, and if the claim is not satisfied by Contractor and the separate Contractor sues the Owner or initiates an arbitration proceeding on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall defend if requested such proceedings at the Contractor's expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorney's fees and court or arbitration costs which the Owner has incurred.

F. The Contractor shall be responsible for any cutting, fitting and patching that may be required to complete the Work except as otherwise specifically provided in the Contract. The Contractor shall not endanger any work of any other Contractors by cutting, excavating or otherwise altering any work and shall not cut or alter the work of any other Contractor. Any costs caused by defective or ill-timed work shall be borne by the party responsible therefore.

G. If a dispute arises between the separate Contractors as to their responsibility for cleaning up, the Owner may clean up and charge the cost thereof to the several Contractors as the Engineer shall determine to be just.

107.05 LIABILITY AND INDEMNIFICATION

The Contractor shall assume all responsibility for the work and shall bear all losses and damages directly or indirectly resulting to the Contractor, to the Owner, to the Engineer, and to their officers, agents, and employees on account of (a) the character or performance of the work, (b) unforeseen difficulties, (c) accidents, or (d) any other cause whatsoever.

The Contractor shall defend, indemnify, and hold harmless the Owner, the Design Engineer, and their officers, agents and employees from all claims, loss, damage, and injury of every kind directly or indirectly arising out of this Contract. The Contractor shall assume this responsibility even if (a) fault or negligence is the basis of the claim, and (b) any act, omission or conduct of the Owner connected with the Contract is a condition or contributory cause of the claim, loss, damage or injury.

The Contractor shall not be liable for, nor be required to defend, or indemnify the Owner or the Design Engineer relative to any claim, loss, damage, or injury resulting solely from acts or omissions by the Owner, the Design Engineer, or their officers, agents or employees. The Contractor shall not be liable for, not be required to defend, or indemnify the Owner or the Design Engineer relating to any claim loss, damage, or injury arising from the use of any maps, drawings, reports, surveys, designs, or specifications furnished by the Owner, Design Engineer, or their officers, agents, or employees. Any specific duty or liability imposed or assumed by the Contractor, as may be otherwise set forth in the Contract documents, shall not be construed as a limitation or restriction of the general liability or duty imposed upon the Contractor by this section.

The Contractor shall assume all responsibility for the work.

107.06 INSURANCE

A. General

1. The Contractor shall provide and maintain during the life of this Contract the insurance coverage designated hereafter. All costs for such insurance shall be born by the Contractor and shall be included in the contract price.

2. Prior to execution by the Owner and before commencing work under this Contract, Contractor shall furnish the Engineer with certificates of insurance specified herein showing the name of the insurance carrier, coverage, type, amount (or limits), policy numbers, effective and expiration dates, description of operations covered, and containing substantially the following cancellation provision:

"The insurance covered by this certificate will not be canceled or materially reduced, except after 30 days written notice has been received by the Owner."

3. In case of the breach of any provision of this Article, the Owner, at its option, may take out and maintain, at the expense of the Contractor, such insurance as the Owner may deem proper. The Owner may deduct the cost of such insurance from any monies which may be due or become due the Contractor under this Contract.

B. Review and Approval of Insurance

The Contractor shall not commence work under this Contract nor allow any subcontractor to commence work on a subcontract until the Contractor has obtained all the insurance required hereunder and such insurance has been approved by the Attorney. All policies or insurance and certificates of insurance shall be satisfactory to the Owner. Approval of the insurance shall not relieve or decrease the liability of the Contractor hereunder.

C. Workers' Compensation, the Federal Longshoremens' and Harborworkers' Act and the Federal Jones Act

1. The Contractor shall provide and shall require all subcontractors to provide workers' compensation coverage for all persons employed under this Contract including the Contractors' partners and any individual regardless of relation to the Contractor's partners and any individual regardless of relation to the Contractor or to the partners who provide work under this Contract. The Contractor shall be required to assure that subject workers will receive the compensation for compensable injuries provided in ORS Chapter 656 either by:

a. a carrier-insured employer; or

b. a self-insured employer as provided by ORS 656.407.

In addition to the statutory benefits outlined above, the Contractor and all subcontractors shall provide employers' liability insurance with limits of not less than:

$100,000 each accident for bodily injury by accident
$100,000 each employee for bodily injury for disease
$500,000 policy limit for bodily injury by disease

2. Evidence of such coverage, including the guaranty or warrant period, shall be filed with the Owner and maintained for the duration of the Contract.

3. The Contractor shall defend, indemnify, and hold harmless, the Owner and the Owner's officers, agents, and employees against any liability that may be imposed upon them by reason of the Contractor's or subcontractor's failure to provide workers' compensation and employers liability coverage.

4. Where work under this Contract is subject to the Federal Longshoremens' and Harborworkers' Act or the Federal Jones Act, the Contractor shall provide coverage for such exposure.

D. General Liability and Automobile Liability

1. The Contractor shall provide a general liability policy that provides coverage for bodily injury including personal injury and property damage liability insurance and automobile liability insurance. Such insurance must protect the Contractor, the Owner, and their officers and employees from all things or damage which may arise out of this Contract or in connection therewith, including all operations of Subcontractors. Such insurance shall provide coverage for not less than the amounts for which public bodies are responsible as set forth in Oregon Revised Statutes Chapter 30, Tort Actions against Public Bodies, but in no event less than the following limits of liability:

$2,000,000 each occurrence
$2,000,000 general aggregate
$2,000,000 product and completed operations aggregate
$2,000,000 personal and advertising injury
$2,000,000 combined single limit automobile liability for owned, non-owned, and hired automobiles.

The policy shall contain an endorsement that the aggregate applies separately to this Contract.

The insurance shall be written on a comprehensive form which includes broad form property damage on an occurrence basis. Unless excluded by Special Provisions, the general liability policy shall include, without deductible, coverage for premises operations, underground hazard, contractual insurance and independent Contractors. Such insurance shall be maintained until the expiration of the guaranty period required by the Contract. Failure to maintain liability insurance as provided above shall, at Owner's option, be cause for immediate termination of the Contract.

2. The Contractor shall provide a letter from the insurance company which states that such insurance shall be without prejudice to coverage otherwise existing.

3. The City of Newberg, the Design Engineer, and their officers, agents, and employees, shall be named additional insureds in the Contractor's General Liability Insurance policy by attaching ISO Endorsement number CG 20 09 11 85 ADDITIONAL INSURED - Owners, Lessees, or Contractors (Form A) or its equivalent. For projects that are within State rights-of-way, a separate insurance coverage that names Oregon Department of Transportation, its officers, agents, and employees as additional insureds would be required.

The policy shall also provide for a Cross Liability Endorsement or Separation of Insured's Endorsement.

The policy shall be endorsed to provide an AMENDMENT - AGGREGATE LIMITS OF INSURANCE (per project) specifying that a separate aggregate limit of liability applies to this Contract.

If there are insufficient insurance proceeds and assets of the Contractor to fully indemnify the City of Newberg, its officers, employees, agents, and the Engineer, then the Owner, its officers, employees, and agents would be indemnified first with any remaining insurance proceeds and assets to be used to indemnify the Design Engineer.

4. If set forth in the Special Provisions, additional insureds shall be the Owner's consultant, Engineer, other governmental bodies with jurisdiction in the area involved in the project, and their officers and employees and such agents as may be specified. For projects that are within State rights-of-way, a separate insurance coverage that names Oregon Department of Transportation, its officers, agents, and employees as additional insureds would be required.

E. Claims on Project

1. The Contractor, when notified of a claim by an affected party shall:

a. Refer claim to the Contractor's insurance carrier or claims administrator.
b. Contractor's insurer will copy Owner on acknowledgment of claim.
c. Contractor's insurer will copy Owner on notice to claimant of disposition of claim.

F. Builders Risk Insurance

During construction, Contractor shall obtain and maintain for the benefit of the parties to the Contract as their interest may appear, all-risk Builder's Risk insurance to the extent of 100 percent of the value of the project. Coverage shall also include: (1) formwork in place; (2) form lumber on site; (3) temporary structures; (4) equipment; and (5) supplies related to the work while at the site. Such insurance shall be endorsed to require thirty days' written notice to the Owner prior to cancellation or change of the policy. One copy of the policy and two certificates of such insurance shall be delivered to the Owner before commencing work and shall be subject to review and approval by the Owner. The Owner may temporarily waive delivery of the copy of the policy. In the event Contractor fails to maintain such insurance, the Owner may arrange therefore; and any premium incurred shall be to the account of Contractor.

107.07 ROYALTIES AND PATENTS

Pay all royalties and license fees required to perform the Work. Defend and indemnify Owner and Design Engineer, from all loss or damage that may result from the Contractor's wrongful or unauthorized use of any patented article or process.

107.08 PERMITS

Secure all Municipal, County, State, Federal or other permits or licenses, necessary or incident to performance of the work under this Contract. Comply with all permit requirements pertaining to the project.

107.09 COMPLIANCE WITH OREGON REVISED STATUTES CHAPTER 279

A. Comply, and require all Subcontractors to comply with the Owner’s public contracting requirements, the requirements of the applicable State statutes, and be subject to the applicable liabilities provided in Oregon Revised Statutes Chapter 279A, B & C (Public Contracts), such as, but not limited to, the statutes that are numbered and referenced, and incorporated herein by an abbreviated subject matter, and listed below and the statutes required to be set forth as conditions in public contracts, which follows:

LIST:

1. ORS 279C.375 Award of contract; Bonds.
2. ORS 279C.380 Waiver of bonds in case of emergency.
3. ORS 279C.540 Maximum hours of labor on public contracts; holidays; exceptions.
4. ORS 279C.520 Condition concerning hours of labor.
5. ORS 279C.840 Payment of Prevailing Rate of Wage.

6. ORS 279C.845 Certified statements regarding payment of prevailing rates of wage.
7. ORS 279C.850 Inspection to determine whether prevailing rate of wage being paid.
8. ORS 279C.855 Liability for violations.

B. The statutes required as conditions in public contracts are as follows:

1. 279A.120 Preferences for Oregon Goods and Services

a. The public contracting agency shall prefer goods or services that have been manufactured or produced in this State if price, fitness, availability, and quality are otherwise equal.

b. Where a public contract is awarded to a nonresident bidder and the contract price exceeds $10,000, the bidder shall promptly report to the Oregon Department of Revenue on forms to be provided by the Department of Revenue the total contract price, terms of payment, length of contract and such other information as the Department of Revenue may require before final payment can be received on the public contract. The public contracting agency shall satisfy itself that the requirement of this subsection has been complied with before it issues a final payment on a public contract.

2. 279A.120(2)(a) Condition of award of contract regarding nonresident bidder.

a. In determining the lowest responsible bidder, a public contracting agency shall, for the purpose of awarding the contract, add a percent increase on the bid of a nonresident bidder equal to the percent, if any, of the preference given to that bidder in the state in which the bidder resides.

3. 279C.505 Condition concerning payment, contributions, liens, withholding, and drug testing.

a. Make payment promptly, as due, to all person supplying to the contractor labor or material for the performance of the work provided for in the contract.

b. Pay all contributions or amounts due the Industrial Accident Fund from the contractor or subcontractor incurred in the performance of the contract.

c. Not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished.

d. Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.

e. Contractor shall demonstrate that an employee drug testing program is in place.

4. 279C.515 Condition concerning payment of claims by public officers, payment to persons furnishing labor or materials and complaints.

a. If the contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the contractor or a subcontractor by any person in connection with the public contract as the claim becomes due, the proper officer or officers representing the state or a county, school district, municipality, municipal corporation or subdivision thereof, as the case may be, may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due the contractor by reason of the contract.

b. If the contractor or a first-tier subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public improvement contract within 30 days after receipt of payment from the contracting agency or a contractor, the contractor or first-tier subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-day period that payment is due under ORS 279C.580 (4) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to the contractor or first-tier subcontractor on the amount due shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is 30 days after the date when payment was received from the

contracting agency or from the contractor, but the rate of interest may not exceed 30 percent. The amount of interest may not be waived.

c. If the contractor or a subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public improvement contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

d. The payment of a claim in the manner authorized in this section does not relieve the contractor or the contractor's surety from obligation with respect to any unpaid claims.

5. 279C.520 Condition concerning hours of labor. Contractor must give a written schedule to employees showing the number of hours per day and days per week the employee may be required to work. No person shall be employed for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it, and in such cases, the employee shall be paid at least time and a half pay for all overtime in excess of eight hours in any one day and 40 hours in any one week when the work week is five consecutive days, Monday through Friday; or for work performed on Saturday or any legal holiday specified in ORS 279C.540.

6. 279C.525 Provisions concerning environmental and natural resources laws; remedies. Solicitation documents for a public improvement contract shall make specific reference to federal, state and local agencies that have enacted ordinances, rules or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the contract. If the successful bidder is delayed or must undertake additional work by reason of existing ordinances, rules or regulations of agencies not cited in the public improvement contract or due to the enactment of new or the amendment of existing statutes, ordinances, rules or regulations relating to the prevention of environmental pollution and the preservation of natural resources occurring after the submission of the successful bid, the contracting agency may issue the contractor a change order setting forth the additional work that must be undertaken. The change order shall include the appropriate extension of contract time and compensate the contractor for all additional costs, including overhead and reasonable profits, reasonably incurred as a result of complying with the applicable statutes, ordinances, rules or regulations. The contracting agency shall have access to the contractor's bid documents when making the contracting agency's determination of the additional compensation due to the contractor.

7. 279C.530 Condition concerning payment for medical care and attention to employees. The contractor shall promptly, as due, make payment to any person, copartnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of the contractor, of all sums that the contractor agrees to pay for the services and all moneys and sums that the contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services. All subject employers working under the contract are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126.

8. 279C.830 Contractual provisions regarding prevailing rates of wage and fee for administration of law. The existing prevailing rate of wage that may be paid to workers in each trade or occupation required for the public works employed in the performance of the contract either by the contractor or subcontractor or other person doing or contracting to do the whole or any part of the work contemplated by the contract. The contract shall contain a provision that the workers shall be paid not less than the specified minimum hourly rate of wage.

107.10 LABOR

Upon notification in writing from the Engineer, remove immediately from the job for its duration any laborer, workman, mechanic, foreman, superintendent, or other person employed who is found to be incompetent, intemperate, troublesome, disorderly or otherwise objectionable, or who fails or refuses to perform his work properly or acceptably.

Comply with provisions of Owner's Equal Opportunity Policy and to Chapter 659, Oregon Revised Statutes relative to unlawful employment practices and discrimination by employers against any employee or applicant for employment because of race, religion, color, sex, or national origin. Particular

reference is made to ORS 659.030, which states that it is unlawful employment practice for any employer, because of the race, religion, color, sex, or national origin of any individual, to refuse to hire or employ or to bar or discharge from employment such individual or to discriminate against such individual in compensation or in terms, conditions or privileges of employment.

107.11 OVERTIME

A. The Contractor must give written notice to its workers of the number of hours per day or days per week that they will be required to work (OAR-839-025-0020(2)(c).

B. In addition to the requirement set forth in Specification 107.09 (ORS 279C.520), Contractor shall notify the Engineer of any overtime operations as soon as possible. The Contractor must provide documentation to the Engineer's satisfaction justifying the overtime work.

C. In the event that the Contractor wishes to proceed with an overtime operation, the Contractor must first notify and obtain approval from the Engineer to do so, prior to commencing such work.

D. For overtime work requested by the Contractor, the Contractor shall pay the applicable wage rate for the Engineer's Inspector, engineering and operations personnel, and other staff required at the project during the overtime hours.

E. This section does not apply to labor performed in the manufacture or fabrication of any material ordered by the Contractor or manufactured or fabricated in any plant or place other than the place where the main Contract is to be performed.

107.12 SAFETY

A. Employee Safety:

The Contractor shall at all times be responsible for the safety of his employees and his subcontractor's employees. The Contractor shall maintain the job site and perform the work in a manner which meets the Owner's responsibility under statutory and common law for the provision of a safe place to work and which complies with the Owner's written safety regulations, if any. An OSHA-certified competent person must be on the project site while work is in progress.

Conduct the project with proper regard for the safety and convenience of the public. When the project involves use of public ways, provide necessary flag persons and install and maintain means of reasonable access to all fire hydrants, service stations, warehouses, stores, houses, garages and other property. Private residential driveways shall be closed only with approval of the Engineer or specific permission of the property Owner. Do not interfere with normal operation of public transit vehicles unless otherwise authorized. Do not obstruct or interfere with travel over any public street or sidewalk without approval. At all times provide open trenches and excavations with secured and adequate barricades or fences of an approved type which can be seen from a reasonable distance. Close up or plate all open excavations at the end of each business day in all street areas unless approved otherwise by the Engineer and in all other areas when it is reasonably required for public safety or as directed by the Engineer. At night, mark all open work and obstructions by lights. Install and maintain all necessary signs, lights, flares, barricades, railings, runways, stairs, bridges and facilities. Observe all safety instructions received from the Engineer or governmental authorities, but following of such instructions shall not relieve Contractor from its responsibility or liability for accidents to workmen or damage or injury to person or property.

B. Public Safety and Convenience:

The Contractor shall at all times conduct his work so as to insure the least possible obstruction to traffic and convenience to the general public and residents in the vicinity of the work and to insure the protection of persons and property. No road or street shall be closed to the public except with the permission of the Engineer and proper governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible to fire fighting equipment at all times. Temporary provisions shall be made by the Contractor to insure the use of sidewalks, private and public driveways and proper functioning of

all gutters, sewer inlets, drainage ditches and culverts, irrigation ditches and natural water courses. The Contractor shall minimize inconvenience to others due to mud and dust.

C. Safety Program:

The Contractor shall adopt a written safety program complying with the requirements of employee and public safety set forth hereinabove. The Safety Program shall also comply with OAR Chapter 437, Division 3, Rules 1926.20 through 1926.32 regarding general safety and health provisions. Safety violations will not be tolerated and repeated violations shall be reasons to shut down the project at no additional cost to the Owner or time extension to the project until the violations are fully corrected.

107.13 RIGHTS-OF-WAY, EASEMENTS, AND PREMISES

A. Confine construction activities within property lines, right-of-way, limits of easements and limits of construction permits as shown or specified in the Contract Documents unless arrangements are made with Owner(s) of adjacent private property. If additional space or property is needed to accommodate Contractor's method for construction of the Work or for the convenience of the Contractor, Contractor shall bear all related costs and responsibilities. Prior to the use of any private property outside the specified boundaries, file with the Engineer written permission from the property Owner(s).

B. Do not unreasonably encumber the specified work areas with materials and equipment. Obtain and bear the costs of permits for special occupancy and use of the specified work areas from the proper agencies. Comply with all requirements regarding signs, advertisements, fires and smoking.

107.14 TWO (2) YEAR MAINTENANCE AND WARRANTY

A. In addition to and not in lieu of any other warranties required under the Contract make all necessary repairs and replacements to remedy, in a manner satisfactory to the Engineer and at no cost to Owner, any and all defects, breaks, or failures of the Work occurring within two (2) years following the date of completion due to faulty or inadequate materials or workmanship. Repair damage or disturbances to other improvements under, within, or adjacent to the Work, whether or not caused by settling, washing, or slipping, when such damage or disturbance is caused, in whole or in part, from activities of the Contractor in performing his duties and obligations under this Contract when such defects or damage occur within the warranty period. The two-year maintenance period required shall, with relation to such required repair, be extended two years from the date of completion of such repair.

B. The Contractor shall provide a maintenance (warranty) bond in an amount equal to fifteen percent (15%) of the sum of the original contract amount plus all change orders that were issued against the contract. The term of the bond shall be two (2) years starting at final written acceptance of the project. The final payment, including any and all project retainage, will be held until the maintenance bond is received. The landscaping shall have a warranty for two (2) calendar years or two full growing seasons, whichever is longer. Continuance of the contract performance bond may act as a maintenance bond.

C. Repair under warranty (all work incidental to repair, including traffic control) shall be at no cost to the Owner. If Contractor, after written notice, fails within ten (10) days to proceed to comply with the terms of this section, Owner may have the defects corrected, and Contractor and Contractor's Surety shall be liable for all expense incurred. In case of an emergency where, in the opinion of the Engineer, delay would cause serious loss or damage, repairs may be made without notice being given to Contractor and Contractor or Surety shall pay the cost of repairs. Failure of the Engineer to act in case of an emergency shall not relieve Contractor or Surety from liability and payment of all such costs.

****

108 PROSECUTION AND PROGRESS OF WORK

****

108.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

Within thirty (30) days of Contract award or one (1) week in advance of starting work, whichever is earlier, SUBMIT FOR WRITTEN APPROVAL a proposed construction schedule to the Engineer. Contractor may not commence work until construction schedule is approved by the Engineer.

If it is desirable to carry on operations in more than one location simultaneously, submit a schedule for each location at least one (1) week in advance of beginning such operations. In the event that the Contractor's proposed construction schedule does not meet the necessary construction program schedule as determined by Owner, immediately resubmit a schedule that conforms as approved. Contractor shall not commence work until schedule is approved by the Engineer.

The schedule shall show the proposed order of work and indicate the time required for completion of the major items of work. This working schedule shall take into account the passage and handling of traffic with the least practicable interference therewith and the orderly, timely and efficient prosecution of work. It will also be used as an indication of the sequence of the major construction operations and as a check on the progress of work.

108.02 PRECONSTRUCTION CONFERENCE

Attend a preconstruction conference, if requested, at a time, prior to start of work, designated by the Engineer. Comply with information and instructions provided at the preconstruction conference as recorded in the minutes of the meeting.

108.03 NOTICE TO PROCEED

A. Unless stated otherwise in the Special Specifications, written Notice to Proceed will be given by the Engineer within thirty (30) days after the performance and payment bonds and all required insurances have been filed with and approved by the Owner and the Contract has been executed. Do not commence work under the Contract until such written notice has been given.

B. Notice to proceed may be delayed up to an additional thirty (30) days (for a total of sixty (60) days) from date of Contract by Engineer if, in the Engineer's opinion, necessary easements or permits have not been obtained, or required utility relocation, construction, or reconstruction has not been completed or has not progressed to a degree that will allow initial contract work to commence.

C. Commence work within five (5) business days after the date of the Notice to Proceed, or such other date as may be fixed by the Notice to Proceed, which date shall establish the date for commencement of the Contract time. Notify Engineer forty-eight (48) hours in advance of the time and place work will be started.

108.04 CONTRACT TIME

A. Time shall be considered the essence of the Contract.

B. Upon commencement of work, Contractor shall provide adequate labor, materials, and equipment and work shall be performed vigorously and continuously in accordance with a schedule which will ensure completion within the specified time limit. Failure to diligently pursue the work may jeopardize additional contract time.

C. Contract times for interim substantial completion dates and final completion date are provided in the Contract for Construction.

108.05 SUSPENSION OF WORK

A. If the work is suspended for convenience: Temporarily suspend work on the Project wholly or in part for convenience of Owner as directed by the Engineer. In the event of such suspension, Engineer shall, except in emergency, and except as hereinafter provided, give Contractor three (3) working days notice. Work shall be resumed within five (5) working days after notice has been given by Engineer to Contractor to do so. Engineer shall allow Contractor an extension of time for completion corresponding to the total period of temporary suspension, and shall reimburse Contractor for necessary

rental of unused equipment, services of watch persons, and other unavoidable expenses accruing by reason of the suspension, as stipulated in Subsection 108.06 (E), Delays and Extensions of Time.

B. If work is suspended by the Engineer: Immediately suspend work on the project, wholly or in part, as directed by the Engineer, for reasonable periods of time as the Engineer may deem necessary, when conditions are unsuitable for satisfactory performance of the work. The Owner shall allow the Contractor an extension of time for completion corresponding to the total period of suspension, but the Contractor shall not be entitled to reimbursement for any costs or damages arising under this clause.

C. If work is suspended for cause: Immediately suspend work on the Project wholly or in part as directed by the Engineer for such periods as the Engineer may deem necessary due to: (1) failure to correct unsafe conditions for working personnel, the general public, or Owner's employees, (2) failure to immediately correct defective and unacceptable work in accordance with Subsection 105.15, (3) failure to carry out provisions of the Contract Documents, and (4) failure to carry out orders or directives.

D. Voluntary suspension by Contractor: There shall be no voluntary suspension or slowing of operations without the prior written approval of the Engineer and such approval shall not relieve Contractor from the responsibility to complete the Contract work within the prescribed Contract time. Should operations be discontinued, Contractor shall notify, in writing, the Engineer at least forty-eight (48) hours in advance of resuming operations.

E. Responsibilities of Contractor:

1. At the commencement of and during any suspension of Work, protect all work performed to prevent any damage or deterioration of the Work. Provide temporary protection devices to warn, safeguard, protect, guide and inform traffic during suspension, the same as though the work had been continuous and without interferences.

2. Bear all costs for providing suitable provisions for traffic control and for maintenance and protection of the work during suspension unless the suspension was for convenience.

F. In all cases of suspension, except voluntary suspension by Contractor, work will be resumed only upon written order of the Engineer or Owner.

108.06 DELAYS AND EXTENSIONS OF TIME

A. If the Contractor is significantly delayed due to court orders enjoining the prosecution of this Project, unavoidable strikes, Acts of God, unusual and extraordinary action of the elements that are of such severity to stop all progress of the work, or act or neglect of Owner not authorized by the Contract, the Contractor shall, within forty-eight (48) hours of the start of the occurrence, give notice to the Engineer of the cause of the potential delay and estimate the possible time extension involved. Within ten (10) days after the cause of the delay has been remedied the Contractor shall give notice to the Engineer of any actual time extension requested as a result of the aforementioned occurrence in accordance with Section 109.05 Claims and Notice.

B. No extension of time will be considered for weather conditions normal to the area and time of year in which the work is being performed. Delays in delivery of equipment or material purchased by the Contractor or his Subcontractors (including Owner-selected equipment) shall not be considered as a just cause for delay, when timely ordering would have made the equipment available. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials. Extensions of time will be considered for delayed delivery of Owner specified equipment "without equal".

C. Within a reasonable period after the Contractor submits to the Engineer a written request for an extension of time the Engineer will make the decision on each request, for Owner approval.

D. An adjustment of Contract time as herein provided shall be the Contractor's sole remedy for any delay in completion of the project arising from causes beyond the control of the Contractor, except for unreasonable delay caused by acts or omissions of the Owner or persons acting therefore. In no event shall the Contractor be entitled to collect or recover any damages, loss or expense incurred by reason of such delay, except for an unreasonable delay caused by acts or omissions of the Owner or persons

acting therefore. However, if Contractor is delayed due solely to a breach by Owner, Contractor will be entitled to recover damages limited to reimbursement for necessary rental of unused equipment, services of watch persons, documented direct overhead costs, documented direct unavoidable expenses accruing by reason of the suspension, plus fifteen percent (15%) of the foregoing damages to cover normal Contractor profit. Contractor shall not be entitled to indirect costs or any other damages arising out of the delay, including but not limited to, interruption of schedules, or any other impact claim or ripple effect. If a delay is caused by Owner and Contractor (joint delay), Contractor shall be entitled to a time extension only, by reason of such joint delay.

108.07 LIQUIDATED DAMAGES

A. Time shall be considered the essence of the Contract. If Contractor fails to complete the project or to deliver the supplies or perform the services within the time specified in the Contract or any extension thereof by Owner, the actual damage to Owner for the delay will be substantial but will be difficult or impractical to determine.

B. It is therefore agreed that Contractor will pay to Owner, not as a penalty but as liquidated damages, the per diem amount, as set forth in the following given Schedule of Liquidated Damages or modification thereof as given in the Special Provisions for each and every calendar day elapsed in excess of the Contract time or the final adjusted Contract time applicable to the work required under the Contract.

SCHEDULE OF LIQUIDATED DAMAGES

Original Amount of Contract		Per Diem Amount of Liquidated Damages	
For More Than	To and Including	Calendar Day*	Business Day
$ 0	$ 25,000	$ 40	$ 55
25,000	50,000	65	85
50,000	100,000	110	150
100,000	500,000	150	210
500,000	1,000,000	225	315
1,000,000	2,000,000	300	420
2,000,000	5,000,000	450	630

* Calendar day amounts are applicable when the contract time is expressed on the calendar day, calendar workday or fixed date basis.

C. Permitting Contractor to continue and finish the work or any part thereof after the Contract time or adjusted Contract time, as pertinent, has expired shall in no way operate as a waiver on the part of Owner or any of its rights under the Contract.

D. Payment of liquidated damages shall not release Contractor from obligations in respect to the fulfillment of the entire Contract, nor shall the payment of such liquidated damages constitute a waiver of Owner's right to collect any additional damages which may be sustained by failure of Contractor to carry out the terms of the Contract, it being the intent of the parties that said liquidated damages be full and complete payment only for failure of Contractor to complete the work on time.

108.08 CONTRACTOR'S REPRESENTATIVE

Designate, in writing before starting work, an authorized representative who shall have complete authority to represent and to act for Contractor, in all directions given by the Engineer. Contractor, or its authorized representative shall supervise the work, and shall be present on site continually during its progress.

If Contractor or its authorized representative is not present, directions may be given by Engineer or his authorized representative to the workmen and such order shall be received and followed. Any direction will be confirmed in writing upon request from the Contractor.

Keep a complete copy of the plans and Specifications on or near the site at all time.

108.09 CONFLICTS, ERRORS, OMISSIONS, AND ADDITIONAL DRAWINGS

Check and compare all plans and Specifications prior to construction and notify Engineer of any discrepancies or omissions in order to permit correction by Engineer. Coordination of plans and Specifications is intended. Furnish labor and materials as required for the work. Should any work or materials be reasonably required or intended for carrying the project to completion which are omitted on the plans and Specifications, furnish same as fully as if particularly delineated or described. The intent of the plans and Specifications is to show and describe a complete project within the limits stated. Dimensions shown on plans shall be followed, rather than scale measurements. Whenever it appears that the plans are not sufficiently detailed or explicit, the Engineer may furnish additional detail drawings or written instructions and Contractor shall perform the work in accordance with the additional details or instructions.

108.10 OWNER'S RIGHT TO DO WORK

Failure or refusal to comply with any of the terms or conditions of the Contract will permit Owner to supply or correct any deficiency or defect or take other appropriate action without prejudice to any other remedy. Such action by Owner shall be taken only after seven (7) days notice by Engineer to Contractor and his Surety, unless in the judgment of the Engineer an emergency or danger to the work or to the public exists, in which event action of Owner as set forth above may be taken without any notice whatsoever. The cost of such action by Owner shall be deducted from the payment then or thereafter due Contractor. Pay Owner any costs in excess of such payment due.

108.11 TERMINATION FOR DEFAULT

A. If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of insolvency, or if he should refuse to or fail to supply enough properly skilled workmen or proper materials for the efficient prosecution of the Project, disregard laws, ordinances or the instructions of the Engineer, or otherwise be in violation of any provision of the Contract, the Owner may, without prejudice to any other right or remedy and after giving the Contractor and its Surety seven (7) days written notice, terminate the services of the Contractor and take possession of the premises and of all materials, tools and appliances thereon as well as all other materials whether on the premises or not, on which the Contractor has received partial payment and finish the work by whatever method it may deem expedient.

B. In the event action as above indicated is taken by the Owner, the Contractor, or its Surety, shall provide the Engineer with immediate and peaceful possession of all of the materials, tools and appliances located on the premises as well as all other materials whether on the premises or not, on which the Contractor has received any progress payment. Upon termination, in the event that the Surety does not complete the Contract, at the election of the Owner, Contractor shall assign any and all subcontractors and material contracts to Owner or Owner's designee. Further, the Contractor shall not be entitled to receive any further payment until the work is completed. On completion of the work, determination shall be made by the Engineer of the total amount the Contractor would have been entitled to receive for the work, under the terms of the Contract, had Contractor completed the work. If the difference between said total amount and the sum of all amounts previously paid to the Contractor, which difference will hereinafter be called the "unpaid balance," exceeds the expense incurred by the Owner in completing the work, including expense for additional managerial and administrative services, such excess will be paid to the Contractor, with the consent of the Surety. If, instead, the expense incurred by the Owner exceeds the unpaid balance, the amount of the excess shall be paid to the Owner by the Contractor or his Surety. The expense incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be as determined and certified by the Engineer.

C. In addition to and apart from the above-mentioned right of the Owner to terminate the employment of the Contractor, the Contract may be canceled at the election of the Owner for any willful failure or refusal on the part of the Contractor to faithfully perform the Contract according to all of its terms and conditions; provided, however, that in the event the Owner should cancel the Contract, neither the Contractor nor its Surety shall be relieved from damages or losses suffered by the Owner on account of the Contractor's breach of Contract.

D. The Owner may, at its discretion, avail itself of any or all of the above rights or remedies and that its invoking of any one of the above rights or remedies will not prejudice or preclude the Owner from subsequently invoking any other right or remedy set forth above or elsewhere in the Contract.

E. None of the foregoing provisions shall be construed to require Owner to complete the work, not to waive or in any way limit or modify the provisions of the Contract relating to the fixed and liquidated damages suffered by Owner on account of failure to complete the Project within the time prescribed.

108.12 TERMINATION IN THE PUBLIC INTEREST

A. It is hereby agreed that the Owner has the right to terminate the Contract in whole or in part when it is considered to be in the public interest.

B. In the event the Contract is terminated as being in the public interest the Contractor shall be entitled to a reasonable amount of compensation for preparatory work and for all costs and expenses arising out of the termination excluding lost profits. The amount to be paid to the Contractor:

1. Shall be determined on the basis of the contract price in the case of any fully completed separate item or portion of the work for which there is a separate or unit contract price; and

2. In respect to any other work, the Contractor will be paid a percent of the Contract price equal to the percentage of the work completed.

108.13 ***WORKING HOURS***

All work shall be done between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday, and no night time, weekend or holiday (see definition in General Requirements) work allowed unless otherwise approved by Owner. Contractor is fully responsible for all unauthorized working hours or any stop work orders due to such violations.

****

109 MEASUREMENT AND PAYMENT

****

109.01 MEASUREMENT OF QUANTITIES

A. Payments shall be based on measurements of completed work in accordance with the United States Standard Measures, and as set forth in the applicable divisions of these specifications.

B. Volume of materials measured in the vehicles by which they are transported will require computing of the volume of the vehicles to the nearest 0.1 cubic yard for its approved capacity, and identification of the vehicle and its capacity. Pay quantities will be determined by vehicle measurement at point of delivery with no allowance for settlement of material during transit.

Loads shall be level and uniform. Payment will not be made for material in excess of the approved capacity of the vehicle and deductions will be made for loads below approved capacity.

C. Volume of concrete and masonry in structures will be measured according to neat lines as shown on the plans or as altered on order of the Engineer.

D. Volume of earthwork, particularly excavation and embankment, will be computed by the average end area method or by other methods of equivalent accuracy.

E. Weight. When payment for materials other than bituminous cements is on a weight basis and unless otherwise set forth in the specification under which material is to be furnished, pay quantities will be determined by weighing material on weigh scales provided by the Contractor as set forth hereinafter. Such weighing is to be of material in the hauling vehicle as loaded for delivery.

Determination of tare weights and weight of loaded vehicles will be to the nearest ten (10) pounds. Tare weights will be determined by weighing empty vehicles at intervals of such frequency as the Engineer deems necessary to ensure accuracy of pay load weights.

F. Scales. When the Contract calls for materials which are to be measured by weighing on scales, provide suitable scales and transport materials to scales at no expense to the Owner. Before use of scales is commenced, and as frequently as the Engineer may deem necessary to ensure accuracy, have the scales examined by an official of the State's Sealer of Weights and Measures, and bear all resulting costs. Maintain the scales in accurate condition at all times.

G. Furnish and so locate scales that the amount of hauling involved in the delivering of materials is no greater than if no weighing were required; if not, bear expense of whatever extra hauling is required. If hauling of materials is to be paid for as a separate pay item, the distance shall be via the most direct practicable route and no allowance will be made for any extra hauling required to reach the scales.

H. If material is weighed on public scales, a representative of the Owner may be present at all times to witness the weighing and to check and compile records of scale weights.

109.02 SCOPE OF PAYMENT

A. Quantities listed in the Bid do not govern final payment. Payments to the Contractor will be made only for actual quantities of Contract items performed in accordance with terms of the Contract and for items of work actually performed under Change Orders.

B. The Contractor shall accept the compensation, as herein provided, in full payment for furnishing all materials, labor, tools and equipment necessary to the completed work and for performing all work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the Owner.

C. The Contractor shall not be entitled to an increase in the Contract price or an extension of the Contract time with respect to any work performed that is not required by the Contract Documents as amended, modified or supplemented, except in the case of an emergency or in the case of uncovering work as provided in paragraph 105.01.

109.03 COMPENSATION FOR ALTERATION OF CONTRACT

A. Unless changes and alterations in the plans, or quantities, or details of construction materially change the character of the work to be performed or the unit costs thereof, the Contractor shall accept as payment in full, so far as Contract items are concerned, payment at the same unit prices as are provided under the Contract for the accepted quantities of work done. If the Contract is done on a lump sum basis, the adjustment for increases or decreases may be based, at the sole discretion of the Engineer, on a theoretical unit price.

B. If either (1) the total project (total bid) cost of the work, using original bid quantities and unit prices, or (2) the total quantity of any major contract item, using original bid quantities changes more than 25 percent, then that part of the increase or decrease exceeding 25 percent shall be adjusted as the parties agree. A major bid item is any contract item, except lump sum items, having an original contract value greater than 10 percent of the total amount of the contract. If the parties cannot agree, the Engineer will determine the equitable adjustment of time, payment, or both. The basis of the equitable adjustment of time will be in accordance with Subsection 108.06. The basis of the equitable cost adjustment for decreases will take into account a redistribution of fixed costs. The basis of the equitable cost adjustment for increases will be by using one of the following methods:

1. Unit contract prices.
2. Other means of establishing costs.
3. Force account.

C. The Contractor shall obtain written consent of the surety or sureties if: (1) changed work increases the total cost by more than 25 percent of the original total contract, or (2) the Engineer requests such consent. The Owner will not adjust for increases or decreases if the Owner has entered the amount for the item in the proposal only to provide a common basis for bidders. The Contractor shall bear all costs that result from increased or decreased in such common-bid-basis amounts.

109.04 PAYMENT FOR CHANGE ORDERS

A. Payment or credit for any alterations covered by a Change Order shall be determined by one or a combination of the methods set forth in 1, 2, 3, or 4 below:

1. METHOD 1. UNIT PRICES. If applicable, those unit prices stipulated in the Proposal, or unit prices negotiated and mutually acceptable to the Contractor and Owner.

2. METHOD 2. LUMP SUM. A total sum for the work negotiated and mutually acceptable to the Contractor and Owner.

3. METHOD 3. FORCE ACCOUNT WORK

a. The Contractor shall perform work on a force account basis upon written notice from the Engineer. Payment will be made as set forth herein.

b. The Contractor must maintain records in such a manner as to provide a clear distinction between direct cost of work performed on force account basis and costs of all other operations performed in connection with the Contract.

c. Daily, furnish to Engineer signed reports itemizing materials used and setting forth the cost of labor and charges for equipment rental, delineating whether said equipment is Contractor or Subcontractor owned. Provide names, identifications, and classifications of workmen, the hourly rate of pay and hours worked, and the size, type and identification number of equipment and hours of equipment operation.

d. Substantiate material charges by vendor's invoices, submit such invoices with the reports; or, if not available, submit with subsequent reports. In the event said vendor's invoices are not submitted within forty-five (45) days after completion of the force account work Owner reserves the right to establish the cost of such materials.

e. When work is ordered to be paid for on a force account basis, such work will be paid for on the basis of cost, plus a negotiated percentage allowance, not to exceed the maximum set forth herein.

f. Items of cost for which payment will be made and to which payment will be restricted, together with the maximum percentage allowance applicable to the respective items, are as follows:

Items of Cost for Which Payments Will Be Made	Maximum Percentage Additional Allowance To Actual Costs
Labor, while engaged directly on force account work	20
Materials and supplies used on force account work	15
Rental on equipment having a value in excess of $350	No additional percentage

g. Payment for labor used in the work will be computed at the rates actually paid by Contractor, but not to exceed prevailing straight time rates established by the Oregon Department of Labor, plus allowable allowance set forth above. Time allowed shall be the number of hours worked directly on force account operations. The employers cost for accident and unemployment compensation premiums, labor insurance cost, public liability and property damage cost and fringe benefits will be included in the direct labor cost item before applying the additional allowance. Written approval is required from the Owner for any overtime work on force account operations prior to any such work. Any

overtime worked on force account operations will be compensated at the straight time rates unless previous approval was obtained from the Engineer.

h. Payment for materials and supplies used on force account work must be supported by paid invoices. Contractor and Subcontractors shall take advantage of all practicable discounts on bills for materials and supplies, and such discounts shall be reflected on all bills and invoices submitted to the Owner for payment. Freight will be considered to be part of the cost of materials and supplies and will be paid for as materials and supplies. Materials and supplies will be paid for as agreed in writing prior to their production or use. If there is no price agreement, the Engineer shall establish a reasonable price for such materials and supplies.

i. For the use of the Contractor's equipment, the Contractor will be paid at the monthly rental rates and the hourly operating costs set forth in the current edition of the "Rental Rate Blue Book for Construction Equipment" and the "Rental Rate Blue Book for Older Construction Equipment" which are published by the Equipment Guidebook Company, 2800 W. Bayshore Road, Palo Alto, California 94303. Reference copies of the above publications are on file at the Oregon State Highway Division Region Engineer, and the area offices of the Associated General Contractors of America. While using the Blue Book to determine allowable rental rates for equipment the hourly rate will be calculated by using the monthly rate as set forth in the book divided by one hundred seventy-six (176) hours. The rental rates will be the total compensation for all costs including fuel, supplies, repairs and renewals. No further allowance will be made for these items. For the use of equipment not listed in said documents, the rental rates shall be as agreed to in writing between the Contractor and the Engineer prior to use of said unlisted equipment. If there is no prior agreement, the Engineer shall establish a reasonable price for such equipment.

j. Time allowed for Contractor's equipment shall be only the number of hours that the equipment actually operated directly on force account work.

k. Compensation on equipment not owned by the Contractor will not exceed the rates actually paid by the Contractor and must be supported with an invoice that represents an arms length transaction. The Contractor and the Engineer will agree on the equipment to be used and the appropriate rental rates before using said equipment on force account work. If prior approval is not obtained, the Engineer will establish the rates by either comparing the available equipment and using the applicable rate for the least expensive equipment that will accomplish the work or utilizing the applicable Blue Book rates as established above. Rental cost for equipment not owned by the Contractor will be established so as to minimize the cost to the Owner. The Hourly rate will be used unless the accumulated cost using the hourly rate exceeds the accumulated cost using the daily rate. The daily rate will be used unless the accumulated cost using the daily rate exceeds the accumulated cost using the weekly rate. This system will be expanded to utilize monthly or yearly rates as appropriate. These rental rates will be considered total compensation for all costs, including move-in, move-out, fuel, supplies, repairs, and renewals. No further allowance will be made for these items without specific approval of the Engineer before the work is commenced. Payment for rental on equipment not owned by the Contractor shall be at the rental costs so determined, plus a negotiated percentage not to exceed the allowance for materials and supplies.

l. Individual pieces of equipment, having a value of $350 or less, will be considered to be tools or small equipment, and no rental will be allowed on such, unless not normally on work site and must be rented from others. Then (k) will apply.

m. No standby charges will be considered as a compensable part of any force account work. When a piece of equipment and operators thereof are hired, rented, or furnished as a unit, (Owner/operator), the additional percentage to be allowed shall be five (5) percent and Contractor shall not be entitled to twenty (20) percent on the time of operators of such equipment. Neither shall Contractor be entitled to payment for contributions made under terms of the Worker's Compensation Act, Unemployment Compensation Act, or Social Security Act or any other benefits to cover the time of these operators.

n. The percentage allowances made to Contractor in accordance with terms outlined herein will be full reimbursement and compensation for all superintendence, use of tools and small equipment, overhead expense, bond costs, record keeping expense, insurance premiums, profits, indirect costs, and all other items of cost not specifically designated herein as items for which payment is to be

made, whether or not the services, costs and other items involved are furnished or incurred by Contractor or Subcontractor.

o. When work is performed on a force account basis by a Subcontractor, the Contractor will be allowed a supplemental markup of five percent (5%) on amount charged by Subcontractor, provided however, Owner will pay no more than a reasonable amount for work performed by a Subcontractor.

4. METHOD 4. PAYMENT DETERMINED BY ENGINEER

a. In case no other basis can be agreed upon, and the Engineer has not directed the work to be paid for on a force account basis, then an allowance may be made, either for or against the Contractor, in such amount as the Engineer may determine to be fair and equitable.

b. The Owner's request for quotations on alterations to the work shall not be considered authorization to proceed with the work prior to the issuance of a formal Change Order, nor shall such request justify any delay in existing work. Lump sum quotations for alterations to the work shall include substantiating documentation with an itemized breakdown of Contractor and Subcontractor costs, including labor, material, rentals and approved services, overhead, and profit calculated as specified under Method "3" above.

c. In Methods "1" and "2" above, Contractor's quotations for Change Orders shall be in writing and firm for a period of thirty (30) days. Any compensation paid in conjunction with the terms of a Change Order shall comprise total compensation due the Contractor for the work or alteration defined in the Change Order. By signing the Change Order, the Contractor acknowledges that the stipulated compensation includes payment for the work or alteration plus all payment for the interruption of schedules, extended overhead, delay or any other impact claim or ripple effect, and by such signing specifically waives any reservation or claim for additional compensation or time in respect to the subject of the Change Order.

109.05 CLAIMS AND NOTICE

A. No claim shall be made by the Contractor for any loss of anticipated profits because of any alterations or changes made pursuant to the provisions of Subsections 104.04 and 109.04, nor by reason of any variation between the approximate quantities and the quantities of work as done. No allowance except as provided in Subsection 109.04 will be made for any increased expense, loss of expected reimbursement or loss of anticipated profits suffered or claimed by the Contractor resulting directly from such alterations or changes or resulting indirectly from unbalanced allocation among the Contract items of overhead expense on the part of the Contractor as a bidder and subsequent loss of expected reimbursements therefore or from any other cause.

B. In any case where the Contractor claims that it is entitled to or will be entitled to additional compensation and/or additional Contract time or if the Contractor considers any interpretation or order by the Engineer to be a breach of Contract, Contractor shall immediately notify the Engineer, in writing, of its intention to make claim before beginning the work or conforming to the interpretation on which the claim is based. Contractor's written notification shall be a written statement describing (1) the act of omission or commission by the Owner or its agent that allegedly caused damage to the Contractor, (2) the nature of the claimed damage, (3) the clauses of the Contract or general legal principles upon which the claim is based, (4) the factual occurrences upon which the Contractor bases the claim. Submission of notice of claim as specified shall be mandatory, and failure to comply shall be a conclusive waiver to such claim for damages by the Contractor. Oral notice or statement will not be sufficient nor will notice or statement after the event since it tends to hinder, if not prevent, the Owner's investigation of the pertinent facts. After said written notification (if the claim is not resolved or withdrawn in writing) and only upon written direction by the Engineer proceed without delay to perform the work pursuant to the decision of the Engineer. While the work on an unresolved claim is being performed Contractor shall keep track of costs and maintain records in the manner set forth in Section 109.04 A 3 FORCE ACCOUNT WORK, at no cost to Owner. Such notice by the Contractor and the fact that Contractor and Engineer are keeping track of costs and maintaining records as required by Section 109.04 A 3 FORCE ACCOUNT WORK shall not in any way be construed as proving the validity of the claim nor the costs thereof.

C. A fully documented claims package shall be submitted in writing to the Engineer within forty-five (45) days after completion of the work upon which the claim is based.

D. Each claim submitted shall include substantiating documentation with an itemized breakdown of Contractor and Subcontractor's costs on a daily basis which shall include, but not be limited to labor, material, equipment, supplies, services, overhead, and profit. All documentation that Contractor believes is relevant to the claim shall be provided in said claim package including without limitation, payroll records, purchase orders, quotations, invoices, estimates, profit and loss statements, daily logs, ledgers, and journals. Failure to submit the claim package in full compliance with this requirement, and/or maintain cost records as herein required, will constitute a waiver of the claim.

E. The requirements of this Subsection 109.05 shall apply to claims for additional or extra compensation or time arising from any situation which may occur except for claims of error in the final estimate as provided in Subsection 109.08.

F. Provided the claim or claims have been submitted in accordance with the requirements of this Subsection 109.05, the Engineer will, as soon as possible, consider and investigate the claim or claims of the Contractor for additional compensation. The Engineer will promptly advise the Contractor of the decision to accept or reject the claim or claims, in full or in part.

G. The Contractor shall commence any suit or action to collect or enforce any claim filed in accordance with this Subsection 109.05 within a period of one year following the mailing of the Engineer's full or partial denial. If said suit is not commenced in said one year period, the Contractor expressly waives any and all claims for additional compensation and any and all causes of suit for the enforcement thereof that he might have had.

109.06 OWNER'S RIGHT TO ACCESS TO CONTRACTOR'S RECORDS

A. In the event that Contractor makes a claim under Subsection 109.05 or performs work under 109.04 A 3 the Owner or its designated representative shall have access and a right (at any time) to inspect, audit and copy Contractor's books, records, documents, diaries, and logs and other evidence (hereinafter referred to as records) pertinent to performance and payment of this Contract and amendments, change orders and any claims made in relation to the Contract. If an audit is conducted, it shall be in accordance with generally accepted auditing standards.

B. The Contractor will make its records available within the boundaries of the City of Newberg, Oregon, or pay all additional costs for travel and per diem or other additional expenses incurred by Owner in examining, auditing, inspecting and copying Contractor's records, by reason of said records not being available within said boundaries.

C. Contractor agrees to the disclosure of all records and to their admission as evidence in any proceeding, between the parties, involving a claim or force account work as set forth in Subsections 109.05 and 109.04(3).

D. In the event that Contractor's records establish a discrepancy, favorable to Owner, in the representations Contractor has made to Owner involving claims or force account work, Contractor shall bear all costs incurred by Owner in conducting the audit and inspection provided herein.

E. All costs referenced in subparagraphs B. and D. may be withheld and/or deducted from any sum due or that becomes due Contractor.

109.07 PROGRESS PAYMENTS AND RETAINAGE

A. Payment for all work under the Contract will be made at the price or prices bid, and those prices shall include full compensation for all incidental work.

B. (1) The contractor or the contractor’s surety and every subcontractor or the subcontractor’s surety shall file certified statements with the public agency in writing, on a form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying:

(a) The hourly rate of wage paid each worker whom the contractor or the subcontractor has employed upon the public works; and

(b) That no worker employed upon the public works has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract.

(2) The certified statement shall be verified by the oath of the contractor or the contractor's surety or subcontractor or the subcontractor's surety that the contractor or subcontractor has read the certified statement and knows the contents thereof and that the same is true to the contractor or subcontractor's knowledge.

(3) The certified statements shall set out accurately and completely the payroll records for the prior week, including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid.

(4) The contractor or subcontractor shall deliver or mail each certified statement required by subsection (1) of this section to the public agency. Certified statements for each week during which the contractor or subcontractor employs a worker upon the public works shall be submitted once a month, by the fifth business day of the following month. Information submitted on certified statements may be used only to ensure compliance with the provisions of ORS 279C.800 to 279C.870.

(5) Each contractor or subcontractor shall preserve the certified statements for a period of three years from the date of completion of the contract.

(6) Certified statements received by a public agency are public records subject to the provisions of ORS 192.410 to 192.505.

(7) Notwithstanding ORS 279C.555 or 279C.570(7), if a contractor is required to file certified statements under this section, the public agency shall retain 25 percent of any amount earned by the contractor on the public works until the contractor has filed with the public agency certified statements as required by this section. The public agency shall pay the contractor the amount retained under this subsection within 14 days after the contractor files the certified statements as required by this section, regardless of whether a subcontractor has failed to file certified statements as required by this section. The public agency is not required to verify the truth of the contents of certified statements filed by the contractor under this section.

(8) Notwithstanding ORS 279C.555, the contractor shall retain 25 percent of any amount earned by a first-tier subcontractor on a public works until the subcontractor has filed with the public agency certified statements as required by this section. The contractor shall verify that the first-tier subcontractor has filed the certified statements before the contractor may pay the subcontractor any amount retained under this subsection. The contractor shall pay the first-tier subcontractor the amount retained under this subsection within 14 days after the subcontractor files the certified statements as required by this section. Neither the public agency nor the contractor is required to verify the truth of the contents of certified statements filed by a first-tier subcontractor under this section.

C. Make progress estimate of work performed in any calendar month and submit to the Engineer for approval, on or before the 7th day of the following month. These estimates shall include value of labor performed and materials incorporated in the work since commencing work under the Contract. Such estimates need not be made by strict measurements and may be approximate only, and shall be based upon the whole amount of money that will become due according to terms of the Contract when Project has been completed.

D. If the Contract price is determined, in whole or in part, on a Lump Sum basis, prepare an itemized cost breakdown relating thereto and have the Engineer approve same before commencing work; progress estimates based on said itemized cost breakdown may be the basis for progress payments. Upon direction by the Engineer provide for revision of the costs breakdown to reflect the true costs of the work as it progresses.

E. If the Contract price is determined wholly on a unit basis, Engineer may use unit prices bid in making progress estimates on the work. In case said unit prices do not, in the opinion of the Engineer,

truly represent actual relative costs of different parts of work, a percentage of the Unit Price may be used in making progress estimate adjustments.

F. If the Engineer receives written notice of any unsettled claims for damage or other costs due to Contractor's operations including, without limitation, claims from any City Department or other governmental agency, an amount equal to the claim may be withheld from the progress, final payments or retainage until such claim has been resolved to the satisfaction of Engineer.

G. Progress payments will be made by Owner on a monthly basis within thirty (30) days from sign off by the Contractor of the progress payment or fifteen (15) days after the payment is approved by Engineer of work performed, whichever comes first. Payment will be issued by Owner for the amount of the approved estimate, less five percent (5%) retainage. Such amount of retainage shall be withheld and retained by Owner until it is included in and paid to Contractor as part of the final payment of the Contract amount. Securities in lieu of retainage will be accepted, or if Contractor elects, retainage as accumulated will be deposited by Owner in an interest-bearing account pursuant to ORS Chapter 279C.570 for progress payments. Upon substantial completion of the work under the Contract which shall be understood to be not less than ninety-seven and one-half percent (97.5%) of the work, the Engineer may, at its discretion, reduce the retained amount equivalent to not less than one hundred percent (100%) of the contract value or estimated value or estimated cost, whichever is greater, of the work remaining to be done.

H. The Engineer may decline to approve an application for payment and may withhold such approval if, in the Engineer's opinion the work has not progressed to the point indicated by the Contractor's submittal. The Engineer may also decline to approve an application for payment or may reduce said payment or, because of subsequently discovered evidence or subsequent inspections, he may nullify the whole or any part of any payment previously made to such extent as may be necessary in his opinion to protect the Owner from loss because of: (1) defective work not remedied, (2) third party claims filed or failure of the Contractor to make payments properly to Subcontractors for labor, materials or equipment, unless Surety consents to such payment, (3) reasonable doubt that the work can be completed for the unpaid balance of the Contract sum, (4) damage to another Contractor's work, (5) reasonable indication that the work will not be completed within the Contract time, (6) unsatisfactory prosecution of the work by the Contractor, (7) claims against the Contractor by the Owner, (8) failure to submit a construction schedule or failure to keep said construction schedule updated as set forth in Subsection 108.01, or (9) exceeding work limits as set forth in Subsection 104.03.

I. When the above grounds are removed, payment shall be made for amounts withheld because of them. Withholding of progress payments or partial payments under the criteria set forth above shall not entitle the Contractor to interest on such withheld payments or partial payments.

J. If Contractor fails to complete the Project within the time limit fixed in the Contract or any extension, no further estimate may be accepted or progress or other payments allowed until the Project is completed, unless approved otherwise by Owner.

K. Progress estimates are for the sole purpose of determining progress payments and are not to be relied on for any other purpose. The making of a progress payment shall not be construed as an acceptance of any of the work or materials under the Contract.

L. When the progress estimate indicates that the progress payment would be less than one thousand dollars ($1,000), no progress payment will be made for that estimate period, unless approved by the Engineer.

M. Partial payment for materials and equipment delivered or stored on the project site will be made pursuant to Section 110 of the Technical Requirements.

N. The Contractor warrants and guarantees that titles to all Work, material and equipment covered by any application for payment, whether incorporated in the project or not, will pass to the Owner no later than the time of payment free and clear of all liens.

109.08 FINAL ESTIMATE AND FINAL PAYMENT

A. Pursuant to ORS Chapter 279C.570, notify the Engineer in writing when work is considered complete and Engineer shall, within fifteen (15) days after receiving notice, make a final inspection and either accept the work or notify Contractor of work yet to be performed on the Contract. If accepted, Engineer shall so notify Contractor, and will make a final estimate and prepare a Certificate of Completion recommending acceptance of the Work as of a certain date.

B. If the Contractor believes the quantities and amounts specified in the final estimate and Certificate of Completion prepared by the Engineer to be incorrect, Contractor shall submit to the Engineer within fifteen (15) days of mailing of the Engineer's final estimate and Certificate of Completion to the Contractor's last known address as shown in the records of the Owner, an itemized statement of any and all claims for additional compensation under the Contract which are based on differences in measurements or errors of computation. Any such claim not so submitted and supported by an itemized statement within said fifteen (15) day period is expressly waived and the Owner shall not be obligated to pay the same. Nothing contained herein shall limit the requirements of Subsection 109.05.

C. A project cannot be accepted until all provisions of the Contract Documents have been met including submission of the certificate of completion and compliance. Upon receipt of the executed Certificate of Completion from the Contractor, the final payment will be made within thirty (30) days in accordance with ORS 279C.570.

D. Provided Contractor submits a claim in the manner and time as required in B) above, the Engineer, as soon as practicable, will consider and investigate the claim or claims of the Contractor for compensation earned under the Contract and not included in the Engineer's final estimate and Certificate of Completion. The Engineer will then promptly advise the Contractor of acceptance or rejection of the claim in full or part. If the Engineer allows the Contractor's claims in full or in part, Engineer will prepare a revised final estimate and Certificate of Completion, including all such items allowed and will submit the same to the Contractor.

E. The Contractor shall execute and return the revised Certificate of Completion within five (5) days of receipt of the final progress payment.

F. If the Engineer rejects the claim or claims, he will issue written notice of rejection mailed to the Contractor's last known address as shown in the records of the Owner.

G. The Contractor shall commence any suit or action to collect or enforce the claim or claims for any additional compensation arising from, or errors of computation in the final estimate within a period of one (1) year following the original mailing of the Engineer's final estimate and Certificate of Completion to the Contractor's last known address as shown in the records of Owner. The Engineer's issuance of a revised final estimate pursuant to this subsection does not alter the original final estimate date. If said suit, action or proceeding is not commenced in said one (1) year period, the final estimate and Certificate of Completion or revised final estimate and Certificate of Completion, if revisions are made, shall be conclusive with respect to the amount earned by the Contractor, and the Contractor expressly waives any and all claims for compensation and any and all causes of suit or action for the enforcement thereof that he might have had.

H. Upon return of the fully executed Certificate of Completion from the Contractor, the Engineer will submit the Certificate of Completion and final estimate to the Owner for approval. Upon approval and acceptance by the Owner, Contractor will be paid a total payment equal to the amount due under the Contract including retainage.

I. Monies earned by the Contractor are not due and payable until the procedures set forth in these Specifications for inspection, approval and acceptance of the Work, for determination of the work done and the amount due therefore, for the preparation of the final estimate and Certificate of Completion processing the same for payment, for consideration of the Contractor's claim, or claims, if any, and for the preparing of a revised final estimate and Certificate of Completion and processing same for payment have been carried out.

J. Execute and deliver to Owner, in form approved by the Attorney, a receipt for all amounts paid or payable to Contractor under the Contract, and a release and waiver of all claims against Owner arising out of or relating to the Contract and furnish satisfactory evidence that all amounts due for labor, materials and other obligations under the Contract have been fully and finally settled or are fully covered

by the performance and payment bonds and/or insurance protecting Owner, its officers, agents and employees as well as Contractor. This is a condition of final payment and Contractor will not be entitled to final payment on release of retainage nor interest thereon until execution and delivery of said receipt, release and waiver.

K. If Owner declares a default of the Contract, and Surety completes said Contract, all payments after declaration of default and retainages held by Owner shall be paid to Surety and not to Contractor in accordance with terms of the Contract.

L. Unless otherwise specifically noted and documented as required in Subsection 109.05 or this Subsection 109.08, acceptance by Contractor of final payment shall release Owner and Engineer from any and all claims by Contractor whether known or unknown, arising out of and relating to the work. No payment, however, final or otherwise, shall operate to release Contractor or its Sureties from warranties or other obligations required in the performance of the Contract.

****

110 ESCALATIONS, OR DE-ESCALATIONS, AND ADVANCE ALLOWANCES

****

110.01 BACKGROUND

110.01.01 Escalations, or De-escalations

Prices for certain construction materials that are commonly used in public works projects (such as petroleum-based products, concrete, and steel) fluctuate sharply from time to time. It is not uncommon to see the material base price change from the time the bids are submitted to the time when a project is awarded and a contract is executed, which can take 30 days or more. The volatility in the material costs makes it much harder for estimators to place their bids in an equitable manner. This results in either the contractor taking a loss or the Owner paying for a higher cushioned price; both of which are undesirable. Therefore, a price escalation, or de-escalation clause is hereby instituted to allow for more equitable treatment to both parties in the construction contract.

110.01.02 Advance Allowances

In most construction projects, the contractors have to pay the suppliers on demand for the materials or within thirty (30) calendar days from the dates of delivery or invoices. The City does not have to pay for the materials until they are fully installed and incorporated into the project. To alleviate the financial burden on all contractors, an advance allowance clause is hereby formulated to allow payment considerations for certain materials-on-hand in public projects awarded by contract after September 2008.

110.02 APPLICABLE CONDITIONS FOR ESCALATIONS OR DE-ESCALATIONS

The material escalation or de-escalation clause shall be evaluated on a project-by-project basis. The general contractor must submit a request for an evaluation at the beginning of the project before project mobilization. A project that satisfies one or more of the following conditions may qualify for the escalation (or de-escalation) clause upon request:

- Requires more than 180 calendar days of construction starting from mobilization to project completion.
- Installs at least 150 tons of asphalt cement material.
- Installs at least 100 tons of reinforcing steel material.
- Indicates an estimated fuel usage in excess of 25,000 gallons.
- Installs at least ¼ mile of 5-foot wide concrete sidewalk area, or a volume equivalent (245 cubic yards) of concrete curb.

Once qualified for escalation (or de-escalation), the price adjustment shall be determined for the month in which the material is incorporated into the project.

De-escalation applies if the cost of material for the month in which it is installed is lower than the base price. In that case, the contractor shall reduce the cost to the Owner accordingly.

The material escalation, or de-escalation, clause will be in effect during the life of the contract. There shall be no markup on the escalation in the invoice.

It is the sole responsibility of the contractor to determine and substantiate the need for escalation, with documentation in each progress billing. The contractor shall waive any right to collect the material escalation if he/she should fail to submit the request for escalation payment within two (2) progress billing cycles after the material is incorporated into the project. The City will have no further obligation to pay for that material escalation at any later time.

When material de-escalates, the contractor is obligated to inform the Owner of the situation and shall adjust the progress billing accordingly. The Owner can request or demand proof of de-escalation from the contractor when de-escalation is suspected at the time when the qualified material is incorporated into the project. When de-escalation is confirmed by direct or indirect means, the contractor shall adjust the applicable progress pay request accordingly.

110.03 PRICE ADJUSTMENT

110.03.01 Asphalt Cement

Payment will be made by the Owner for asphalt cement price escalation, or de-escalation, based on the following:

Monthly Asphalt Cement Material Price (MACMP) – The MACMP is established by the Oregon Department of Transportation (ODOT) each month. Use the "Poten Pacific Northwest" numbers for projects in Western Oregon. Information regarding calculation of the MACMP and the actual MACMP can be found on ODOT's website:
http://www.oregon.gov/ODOT/HWY/ESTIMATING/asphalt_fuel.shtml#Asphalt.

Base Asphalt Cement Price (BASE) – The base price for this project is the MACMP published on the ODOT website for the month immediately preceding the bid submittal date.

Asphalt Concrete Price Adjustment – The asphalt concrete escalation, or de-escalation clause will be in effect during the life of the contract. The price adjustment will use the MACMP for the month in which the asphalt is incorporated into the project. The price adjustment will be determined by the following formula:

Price Adjustment = (MACMP – BASE) x Asphalt Content (%) x (Tons of Asphalt Concrete Incorporated)

The asphalt content percentile (percentage) is the target asphalt content for the asphalt concrete incorporated into the project.

110.03.02 Steel

Payment will be made by the Owner for steel material price escalation, or de-escalation, based on the difference in monthly steel material value (MV) as compared to the base price for the month immediately preceding the bid submittal date. The steel material value is from the IDWPUSISTEEL1 Bureau of Labor Statistics (BLS), Producer Price Indexes (PPI) using non-seasonally adjusted indexes only. The published values can be found on ODOT's website:
http://www.oregon.gov/ODOT/HWY/ESTIMATING/steel.shtml.

Only the published values on ODOT's website will be used after the IDWPUSISTEEL1 BLS PPI establishes the numbers as final numbers.

110.03.03 Fuel

Payment will be made by the Owner for fuel price escalation, or de-escalation, based on the difference in monthly fuel price (MFP) as compared to the base price for the month immediately preceding the bid submittal date. The published values can be found on ODOT's website:
http://www.oregon.gov/ODOT/HWY/ESTIMATING/asphalt_fuel.shtml#Fuel.

Monthly fuel prices are the average weekly prices obtained from the OPIS weekly listing dated the first Monday of each month for HS No. 2 diesel fuel for Portland, Oregon.

110.03.04 Concrete

Payment will be made by the Owner for concrete price escalation, or de-escalation, based on the difference between the documented monthly concrete bid price (CP) from the supplier and the base price for the month the bid is submitted. The change must be at least 3% for consideration.

110.04 PROCESS FOR ADVANCE ALLOWANCES

The Owner will not consider or make advance allowances on the materials-on-hand unless all the procedures are followed and the applicable conditions are satisfied. Once the conditions are met, the Owner will provide an advance allowance at 85% of the invoice value of the materials, less the applicable retainage.

110.04.01 Value of Materials-On-Hand

If the total value of materials-on-hand is at least $10,000 or the total value of a single class of materials-on-hand is at least $5,000, the Contractor may request an advance allowance for the materials-on-hand in the progress billing.

Items that are qualified for advance allowances are:

- Street lights (poles and prefabricated pole bases).
- Junction boxes and utility vaults.
- Pipes and conduits (made of ductile iron, 3034 PVC, or other materials for water, wastewater, reclaimed water, storm, electrical or telecommunication applications, not including pipe fittings and trench backfill materials).
- Retaining wall or sound wall (limited to prefabricated blocks or panels).
- Manholes (for wastewater or storm applications).
- Storm inlets (limited to prefabricated catch basins or control structures).
- Valves (such as butterfly or gate valves for water or wastewater applications).
- Double check backflow devices.
- Water meters.
- Fire hydrants.

110.04.02 Request for Advance Allowances

The Contractor must submit a written request for advance allowance for materials-on-hand and make sure that the Owner receives it at least ten (10) business days before the pay period cutoff date. The request shall be accompanied by a written consent of the Contractor's Surety. The advance allowance will be included in the progress payment for that pay period upon review and approval by the Owner.

110.04.03 Storage or Stockpile Conditions

The materials-on-hand shall have been delivered and/or acceptably stored or stockpiled at a pre-approved site by the Owner. If the site is private, the Contractor must obtain a written permission from its Owner for site access and materials storage. This permission shall also allow Owner personnel to enter for materials inspection and verification as needed. The Contractor shall furnish a copy of the written permission to the Owner.

To be eligible for advance allowance, the materials shall:

- Meet the Specification requirements.

- Have the required materials conformance and quality compliance documents on file with the Owner.
- Be in a form ready for installation.
- Be clearly marked and identified as being specifically fabricated, or produced, and reserved for use on the project.

110.04.04 Responsibility for Protection and Replacement

The Contractor must have full control and responsibility for the protection of materials-on-hand from the elements and against damage, loss, theft, or other impairment until the entire project has been completed and accepted by the Owner. The Contractor shall be solely responsible for the replacement cost of the materials-on-hand if the materials are damaged, lost, stolen, or otherwise impaired while stored. The Contractor is fully responsible for any escalation to the materials replacement costs, and any delay due to the replacement cause. The monetary value advanced for them, if any, will be deducted from the next progress payment if the Contractor does not replace them, or show proof of replacement, in a timely manner.

110.04.05 Follow-up of Payment for Materials-On-Hand

The Contractor shall provide the Owner with proof of payment to the materials suppliers for the purchased materials within thirty (30) calendar days from the date of mailing the progress payment which has included the advance allowance. If proof of payment is not provided, sums advanced will be deducted from future progress payments, and the Owner will not approve any further prepayment for advance allowance requests.

110.04.06 Possession of Materials-On-Hand

If the Contract is terminated, the Contractor shall provide the Owner an immediate possession of all materials for which advance allowances have been received, as provided above. If, for any reason, an immediate possession of the materials cannot be provided, the Contractor shall immediately refund to the Owner the total amount advanced for the materials. The Owner may deduct any amount not so refunded from the final payment.

END OF DIVISION

DIVISION TWO
GENERAL TECHNICAL REQUIREMENTS

****

201 MOBILIZATION

****

201.01 DESCRIPTION

This section covers, but is not limited to, work necessary to obtain all bonds, insurance, licenses, and permits; move in personnel and equipment; set up all offices, buildings, and facilities; provide all required light, power, and water; install project information signs if required; prepare for construction complete; demobilize, including removal of all facilities and clean up; and all other work to successfully complete the project which is not covered in other bid items.

201.02 MATERIALS

Provide all materials required to accomplish the work as specified.

201.03 CONSTRUCTION/GENERAL REQUIREMENT

Set up construction facilities in a neat and orderly manner within designated or approved work area. Provide for an acceptable material and equipment storage area. Supply all labor and equipment necessary to accomplish the work as specified. Conform to applicable requirements of Section 105 of GENERAL REQUIREMENTS, including, but not limited to, (1) required notifications, (2) protection of surveying monuments and other markers, (3) temporary traffic control, (4) temporary utility connections, (5) protection of property, (6) water and air pollution, and (7) noise.

201.04 MEASUREMENT AND PAYMENT

201.04.01 Lump Sum Basis

When mobilization is listed as a separate pay item on the Proposal, it will be paid for on a lump sum basis. Normal retainage will be deducted from partial payments.

Partial payments for Mobilization under the Contract will be made under the following schedule:

1. When 5 percent of the total original contract amount is earned from other bid items, 50 percent of the amount bid for Mobilization, or 5 percent of the total original contract amount, whichever is the least, less normal retainage, will be paid.

2. When 10 percent of the total original contract amount is earned from other bid items 100 percent of the amount bid for Mobilization, or 10 percent of the total original contract amount, whichever is the least, less normal retainage, will be paid.

3. Upon completion of all work on the project, payment of any amount bid for Mobilization in excess of 10 percent of the total original contract amount will be paid.

The above schedule of progress payments for Mobilization shall not be construed to limit or preclude partial payments otherwise provided by the Contract.

201.04.02 Incidental Basis

When not listed in the Proposal, all Mobilization costs will be considered incidental work for which no separate payment will be made.

****

202 TEMPORARY TRAFFIC CONTROL

****

202.01 DESCRIPTION

This section covers all work necessary to conduct construction operations so as to offer the least possible obstruction and inconvenience to the public and to protect pedestrian and vehicular traffic.

202.02 UNIFORM TRAFFIC CONTROL DEVICES

Provide barricades, signs, and traffic control devices built in conformance with the Manual on Uniform Traffic Control Devices (current edition), published by the U.S. Department of Transportation, and the Oregon supplements to the Manual published by the Oregon Department of Transportation.

202.03 CONSTRUCTION

202.03.01 General

Use flag persons and provide and maintain such signs, barricades, warning lights, and other traffic control devices in conformance with the manuals referenced in Subsection 202.02. Adequately warn the public at all times of existing conditions on all streets affected by work operation.

Patrol the construction area at least twice daily and reset all disturbed signs and traffic control devices immediately. Remove or cover non applicable signs when not needed. Prior to closing or partial closing of any street, conform to Subsection 105.04 NOTIFICATION OF UTILITIES AND AGENCIES.

202.03.02 Traffic Control Within the Project

Formulate and submit a traffic control plan and a work schedule to minimize the disruption of traffic. Plan shall be submitted at the pre-construction conference. If no conference is held, plan shall be submitted at least 10 days in advance of beginning work. Obtain approval of plan and schedule from Engineer before commencing work. Allow traffic to pass through the work with as little inconvenience and delay as possible.

The traffic control plan shall contain a complete signing plan for semi-permanent and portable signs, barricades, and other traffic controls, provisions to keep the signs or devices current with the construction activities and the illumination of all detours and obstructions during hours of darkness. Be responsible for furnishing, installing, and maintaining all traffic control devices. Maintain these devices at all times including non-business hours.

Provide approved access to private properties at all times, except during stages of construction when it is impractical to perform construction and maintain access to private property simultaneously, as determined by the Engineer. When access is to be denied notify occupants of affected properties at least 48 hours in advance.

When, in the judgment of the Engineer, vehicular parking is a hazard to through traffic or to the work, furnish and place NO PARKING signs on any street which is directly involved in the construction work.

Only one intersection will be closed at a time without prior approval by the Engineer. The Contractor will notify Police and Fire departments in the jurisdiction of the closing and opening of streets. Pedestrian detours shall not exceed one block in length and all foot bridges will be provided with adequate handrails.

202.03.03 Construction and Maintenance of Detours

Construct and maintain temporary detours for protection of the work and the safe passage of traffic around work area.

Conform to requirements for detours in Subsection 107.12 of the Safety Requirements.

202.03.04 Flagging Requirements

The Contractor shall provide and maintain such signs, barricades and warning lights as are necessary to warn and protect the public at all times on highways, roads or streets affected by work operations. In addition, the Contractor shall also provide all necessary flag persons and guards necessary to warn and protect the public. Each flagger on duty shall wear an orange or yellow colored hard hat and an orange colored or fluorescent red-orange or fluorescent yellow-orange colored vest and shall be equipped with a highly visible, reflectorized "Stop-Slow" hand sign conforming to current standards for daylight use; and with illuminated stand area, of high visibility for night use.

202.03.05 Dust Control

Contractor shall be responsible for maintaining adequate dust control during and after construction and prior to acceptance by the Owner. The Contractor shall apply a fine spray of water or other approved dust pallative to unpaved surfaces. Paved surfaces shall be broomed with power brooms (i.e., street sweepers) to control dust.

202.04 MEASUREMENT AND PAYMENT

202.04.01 Lump Sum Basis

When listed in the Proposal as a separate pay item, payment for Temporary Traffic Control will be made on a lump sum basis.

202.04.02 Incidental Basis

When not listed in the Proposal for separate payment, all Temporary Traffic Control will be considered incidental work for which no separate payment will be made.

****

203 CLEARING AND GRUBBING

****

203.01 DESCRIPTION

This section covers work necessary to clear, remove, and dispose of all debris and vegetation such as stumps, trees, logs, roots, shrubs, vines, grass, and weeds within the designated limits, to preserve from injury or defacement such objects and vegetation as are designated to remain in place, and to perform final clean-up of the designated area.

Clearing is defined as cutting of trees, bushes, vines, and other vegetative growth at or above ground surface and removal from the site of all such cut or down vegetation.

Grubbing shall consist of the elimination of wooden and vegetative matter occurring at or below ground surface including, but not limited to, stumps, trunks, roots, canes, stems, debris remaining from clearing work, and sticks having a diameter of one inch or more.

Review with the Engineer the location, limits, and methods to be used prior to commencing work under this section.

Removal of man-made structures, including, but not limited to, concrete slabs, walls, vaults, footings, asphaltic surfaced areas, and graveled areas, shall be included in payment for excavation or excavation and backfill as provided in Subsection 205.03.04, and will not be included in Clearing and Grubbing.

As indicated in Subsection 105.08 PROTECTION OF PROPERTY, occupants of buildings adjacent to the work shall have salvage rights to plants, trees, shrubs, fences, and other improvements in the right-of-way. Contractor shall notify adjacent property Owners. Contractor does not assume Ownership of clearing and grubbing items until after fulfilling the requirements of Subsection 105.08, and Subsection 203.03.02 TIMBER SALVAGE.

203.02 MATERIALS

Explosives used for clearing and/or grubbing shall be fresh, stable material manufactured to the standards of the "Institute of Makers of Explosives", and shall conform to the applicable requirements of ORS Chapter 476 and 480.

203.03 CONSTRUCTION

203.03.01 General

Obtain the required permits as specified in Subsection 105.08, PROTECTION OF PROPERTY, and perform clearing work in conformance thereto.

Remove trees and plants as designated within the area of work, and remove all sod, topsoil, and organic earth within designated areas.

Remove and stockpile as directed, all topsoil that is free of roots, rocks, and other objectionable material and is determined by the Engineer to be suitable for future use. Take reasonable care to prevent topsoil from becoming mixed with subsoil. Contractor shall provide imported topsoil per Subsection 207.02.04 at its sole expense if existing topsoil is not adequately segregated as determined by the Engineer.

203.03.02 Timber Salvage

203.03.02A Trees in Street Right-of-Way

The adjacent property Owner shall have the right to any trees felled in the right-of-way adjacent to Owner's property. Contractor shall notify adjacent property Owners by mail or doorhanger at least 48 hours prior to felling trees. Trees shall be stacked and decked on Owner's property or removed from the construction site if the Owner does not reserve the right of Ownership.

203.03.02B Trees on City-Owned Property

Owner reserves the right to merchant timber as designated in the Contract Documents and as marked at the project site by the Engineer. Assume Ownership, remove, and dispose of all other timber. Cut, trim, and handle marked merchantable timber in such a manner as to ensure the best sale value to Owner and dispose of resulting waste materials as hereinafter specified.

203.03.03 Protection of Existing Vegetation

Protect all trees, shrubbery, and other vegetation, not designated for removal, from damage caused by the work. Cut and remove trees and branches only where approved. When directed, remove branches other than those required to provide a balanced appearance of any tree. Contractor will provide adequate protection for trees, shrubbery, and other vegetation adjacent to the work area, which are to remain, as indicated on the plans. No roots projecting into the excavation will be cut except in the presence of the Project inspector. All roots authorized to be cut will be cut neatly, with a sharp tool to avoid torn root endings. Remove branches only as directed by the Engineer and treat scars with approved tree sealant.

203.03.04 Clearing

Clear the area above the natural ground surface of all vegetation and objectionable materials. Cut timber and timber growth so that no stump extends above ground surface more than six inches.

Prune all limbs over paved streets to an elevation fourteen feet above the pavement on arterial and collector streets, and eleven feet above the pavement on residential streets. Prune all limbs over sidewalks to an elevation eight feet above the sidewalk. All such pruning shall be done in accordance with accepted arboricultural standards, and shall be approved by the Engineer.

203.03.05 Clearing Borrow and Waste Disposal Areas

Clear areas designated as borrow and waste disposal areas to designated limits and dispose of all waste as herein specified.

203.03.06 Grubbing and Stripping

Completely remove all stumps and roots within the limits of required excavations and fill areas. No stumps or portion thereof shall come within three (3) feet of fill subgrades or slope surfaces. Use of explosives for stump removal shall conform to requirements of Subsection 203.02. Obtain any and all permits required for use of explosives from controlling jurisdiction.

On areas to be occupied by fills, remove all grass, roots, and embedded wood to a depth not less than 3 feet below subgrade or slope surface on which the fill is to be constructed.

On excavation areas, remove all roots and embedded wood to a depth not less than 1 foot below subgrade or slope surface through which excavation is required.

203.03.07 Disposal of Waste Material

Remove and dispose of all waste material or debris from the site. Obtain all necessary permits for disposing of waste materials. Copies of such permits shall be provided the Engineer prior to disposal.

203.03.08 Backfilling and Clean-up

In areas not subject to future excavations or filling, fill all holes and depressions caused by clearing and grubbing with material acceptable to the Engineer and reshape area to drain properly and to conform to adjacent undisturbed topography.

Leave work area in a clean and sightly condition, free from litter and debris.

203.03.09 Removal and Replacement of Signs, Mailboxes, Posts, etc.

Contractor will be responsible for the removal and replacement of all signs, mailboxes, posts, etc. when not specifically designated otherwise by the Engineer. Contractor to contact property Owner prior to removal and reinstallation of mailbox. Mail boxes in work area must be temporarily moved to allow clearing and excavation as well as easy access by postal workers and residents. Upon completion of excavation, mail boxes shall be permanently replaced behind curb to postal service regulations.

203.04 MEASUREMENT AND PAYMENT

203.04.01 Lump Sum Basis

When shown in the Proposal, payment for clearing and grubbing will be made on a lump sum basis for all clearing and grubbing within the limits specified.

203.04.02 Incidental Basis

When not listed in the Proposal for separate payment, all clearing and grubbing will be considered incidental work for which no separate payment will be made.

****

204 EROSION CONTROL

****

204.01 DESCRIPTION

This section covers all work necessary to conduct construction operations so as to prevent erosion and protect downstream receiving water.

204.02 MATERIALS

204.02.01 Erosion and Sediment Control

Provide all erosion control materials for all erosion and sediment control measures to meet 1200C permit requirements. Silt fences, inlet protection with bio-filter bags or silt sacks, check dams with bio-filter bags, jute matting for ditch and slope stabilization, seed and mulch, and gravel construction entrance are examples of erosion and sediment control measures.

204.02.02 Protection Fencing

Provide orange construction fence material to delineate construction or area for protection.

204.03 CONSTRUCTION

204.03.01 Erosion and Sediment Control

Install and maintain erosion and sediment control measures to meet the 1200C permit requirements. Remove them at the completion of the project when controls are no longer required. Seed and mulch exposed areas when nothing is specified for soil protection.

204.03.02 Protection Fencing

Install orange construction fence to protect trees and/or to provide buffer from construction when noted on plans.

204.04 MEASUREMENT AND PAYMENT

Payment shall be on a lump sum basis.

****

205 EXCAVATION, EMBANKMENT, BEDDING, AND BACKFILL

****

205.01 DESCRIPTION

205.01.01 GENERAL

This section covers work necessary for excavation, construction of embankment, foundation stabilization, pipe bedding, pipe zone backfill, trench backfill, and disposal of material required in construction of streets, sewers, water mains, storm drains, structures, and appurtenances thereto.

205.01.02 Unclassified Excavation

Unclassified excavation is defined as all excavation, regardless of type, nature, or condition of materials encountered unless separately designated. The Contractor shall assume full responsibility to estimate the kind and extent of various materials to be encountered in order to accomplish the work.

205.01.03 Rock Excavation

Rock excavation is defined as the removal of all material which by actual demonstration cannot, in Engineer's judgment, be reasonably excavated with equipment comparable to types listed in TABLE 1 and equipped with rippers or similar approved equipment and which is, in fact, systematically drilled and blasted or broken by power-operated tools designed for rock excavation. Engineer may waive the demonstration if material encountered is well-defined rock. The term Rock Excavation shall be understood to indicate a method of removal and not a geological formation.

TABLE 1

Manufacturer	Model	Minimum Net Horse Power	Type of Excavation
Caterpillar	225	125	Trench
John Deere	690	125	Trench
Case	125B/980B	125	Trench
Caterpillar	D8	300	Grading and Structural

In trenches, boulders or pieces of concrete below grade larger than ½ cubic yard will be classified as rock if drilling and blasting or other approved methods are actually used for their removal from the trench. If material which would be classified as rock by the above definition is mechanically removed without blasting, breaking, or splitting, it will be considered unclassified excavation and will be paid for as such at the unit price bid, or if larger equipment is specifically brought in for the sole purpose of rock removal, as defined above, then such removal will be considered rock excavation and will be paid for as such at the unit price bid.

205.01.04 Trench Excavation

Trench Excavation is defined as removal of all material encountered in the trench to the depths and widths as shown and, unless otherwise classified by the Engineer, shall be considered unclassified or rock excavation.

205.01.05 Embankment

Embankment is defined as furnishing, placing, and compacting embankment materials to the depth and configuration as shown.

205.01.06 Foundation Stabilization

Foundation stabilization is defined as the removal of unsuitable material in the bottom of an excavation as directed by the Engineer and replacement with specified material for support of a roadbed, pipe, main, conduit, structure, or appurtenances thereto.

205.01.07 Over-Excavation

Over-Excavation is the removal of unsuitable material below the limits designated for excavation.

205.01.08 Pipe Zone

Pipe zone is defined as the full width of the trench from 6-inches below outside of the pipe barrel to a point 12-inches above the top outside surface of the pipe barrel as shown on the appropriate Standard Drawing.

205.01.09 Trench Backfill

Trench backfill is defined as furnishing, placing, and compacting backfill material in the trench between the top of the pipe zone and the bottom of the pavement base or ground surface. Trench backfill will be classified as either native or select backfill.

205.02 MATERIALS

205.02.01 Embankment Materials

Provide embankment materials of approved earth, sand, bank-run or river-run gravel or combinations thereof, which can be compacted to the densities specified free of peat, humus, muck, frozen ground, organic matter, or other materials detrimental to construction of firm, dense, and sound embankments.

205.02.02 Foundation Stabilization

Use foundation stabilization consisting of gravel or crushed aggregate ranging in size from 6 inch-minus to ¾ inch minus as specified. Material shall be well graded from coarse to fine, and free from excessive clay or organic material.

205.02.03 Vacant

205.02.04 Pipe Zone Material

Use pipe zone material consisting of ¾" - 0" crushed aggregate or sand, as noted on the plans or in the special provisions.

Pipe zone material shall be as specified for crushed aggregate material in Section 205.02.06B CRUSHED AGGREGATE.

205.02.05 Native Backfill Material

Use native material excavated from within limits of the project that can be compacted to the density specified and free from vegetation and other deleterious material containing no frozen ground.

Maximum particle size shall be as shown, except for trench backfill, wherein the particle size shall not exceed 6 inches in diameter.

205.02.06 Select Backfill Material

Use imported granular material for backfill consisting of bank-run or river-run gravel from an approved source, sand, or crushed aggregate as specified.

205.02.06A Bank-Run and River-Run Gravel

Use imported bank-run or river-run gravel from an approved source. Approval of material from a location does not mean approval of the entire site, but only as material continues to meet specification. Material shall be well- graded sandy gravel free from roots, clay balls, organic material, and debris. Maximum size of material shall be six (6) inches. No more than five (5) percent by weight shall pass the No. 200 sieve. The material shall have a minimum uniformity coefficient of 8, and a minimum permeability coefficient of 10-3 cm/sec.

205.02.06B Crushed Aggregate

Coarse and fine aggregates shall conform to requirements of Section 206 MATERIALS and to additional requirements contained herein.

Base aggregates to be incorporated in the work shall have a sand equivalent of not less than 30 when tested in conformance with AASHTO T-176.

Base aggregate shall meet the requirements for Liquid Limit and Plasticity Index of Subsection 206.02.12C FINE AGGREGATE.

The base aggregates shall be uniformly graded from coarse to fine and shall conform to one or another of the following grading requirements as specified:

	Separated Sizes				
	2½" - 0	2" - 0	1½ " - 0	1" - 0	3/4" - 0
Sieve Size	Percentages (by weight)				
3"	100				
2½"	95 - 100	100			
2"		95 - 100	100		
1½"			95 - 100	100	
1¼"	55 - 75				
1"		55 - 75		90 - 100	100
¾"			55 - 75		90 - 100
½"				55 - 75	
3/8"					55 - 75
*¼"	30 - 45	30 - 45	35 - 50	40 - 55	40 - 60

*Of the fraction passing the 1/4 inch sieve, 40 percent to 60 percent shall pass the No. 10 sieve.

For determination of sizes and grading conform to AASHTO T-27.

Where 1"-0 base aggregate is approved for use, at least 70 percent (by weight) of the material passing through the 1/4" sieve but retained on the No. 10 sieve shall have at least one mechanically fractured face.

Materials will be subject to acceptance as follows:

Construction Method	Time of Acceptance
Stationary plant mixed	Immediately following mixing
Travel plant mixed	After mixing and before laying
Road mixed	After mixing and before compacting

Acceptance will be based on periodic samples taken following mixing.

For trench backfill, the maximum particle size shall not exceed 1 1/2" in pipe zone.

205.02.06C Sand

1. Use sand consisting of fine granular material, naturally produced by the disintegration of rock, or produced from crushed gravel, and reasonably free of organic material, mica, clay, and other deleterious substances.

2. Use dredge sand produced from river dredging and reasonably free of organic material, mica clay, and other deleterious substances.

The grading of sand used for backfill shall be as follows, or as approved by the Engineer:

	Percentage Passing by Weight	
Sieve Size	Coarse Sand	Fine Sand
1"	100	100
3/8"	95 - 100	…
#4	80 - 100	90 - 100
#30	10 - 30	…
#100	…	2 - 10
#200	0 - 8	0 - 4
Sand Equivalent	50 min.	50 min.

3. When using sand as imported granular trench backfill material, material must be able to stand on a minimum 60° angle from horizontal following compaction to specified density unless otherwise approved by the Engineer. For the purpose of this specification, specified density will be a minimum of 95% of relative density as determined by the appropriate City of Newberg standard test at optimum moisture.

205.02.07 Imported Topsoil

Unless specified otherwise, imported topsoil shall be used. Provide natural, fertile, friable topsoil, representative of local productive soil, and 90 percent free of clay lumps or other foreign matter larger than 2-inch diameter, not frozen or muddy, with pH 5.0 to 7.0, and not less than 3 percent humus as determined by loss on ignition of moisture-free samples dried at 100 degrees C. Gravel portion (particles larger than 2 mm) shall not exceed 15 percent of total volume. Imported topsoil shall be free of quack grass, horsetail, and other noxious vegetation and their seeds. Should such regenerative material be present in the soil all resultant growth, both surface and root, shall be removed and replaced to original specifications at the Contractor's expense within 2 years of acceptance of the work.

205.02.08 Native Topsoil

When specified, use topsoil from the site, properly stored and protected and free from grass, debris, overburden and roots, sticks, hard clay, and stones which will not pass a 1-inch square opening.

205.02.09 Water

Use water which conforms to requirements of Section 206 MATERIALS TYPES AND USE. Provide water at the Contractor's sole expense. Whenever city water is to be used, the Contractor shall obtain a meter issued by the Owner.

205.02.10 Explosives

Use explosives which are fresh, stable materials manufactured to the standards of the "Institute of Makers of Explosives", and conforming to applicable requirements of ORS Chapters 476 and 480.

205.03 CONSTRUCTION

205.03.01 Excavation

Excavate, remove, and dispose of all formations and materials, natural or man-made, irrespective of nature or conditions, encountered within limits hereinafter defined or as specified, necessary for construction of the project. Method of excavation used is optional. Overbreak shall be removed at the Contractor's expense. Use hand methods for excavation that cannot be accomplished without endangering existing or new structures or other facilities.

Furnishing, installing, and removal of all shoring, sheeting, and bracing as required to support adjacent earth banks and structures, and for the safety of the public and of all personnel working in the excavation shall be the Contractor's responsibility and shall be considered incidental to the construction.

205.03.02 Rock Excavation and Explosives

205.03.02A Depth of Excavation

Excavate to the depths designated or as shown on the appropriate plan or standard drawing. Correct over-excavation with compacted material as directed at no additional expense to Owner. In trenches for sewers, and water mains or conduits, remove all material necessary to provide a minimum clearance of 6 inches under the pipe and replace with bedding material in conformance with Subsection 205.02.04 PIPE ZONE MATERIAL.

205.03.02B Methods and Records Required

Before rock removal by systematic drilling and blasting or other methods will be permitted, notify Engineer who, with Contractor or its representative, will determine the amount of material to be removed as rock excavation and will record the information. Then drill, blast, or break with power-operated tools specially designed for rock excavation, and excavate the material.

205.03.02C Use of Explosives

Obtain any and all permits required for use of explosives required by the City of Newberg, and other governing agencies.

Use of explosives shall be avoided as far as practicable, and in no case shall tunnel blasting methods be used. Such blasting as must be done shall be controlled in a manner which will avoid possible shattering or loosening of materials back of lines to which the excavations are to be made. All blasting shall be supervised and/or done by a state certified powder person. Be responsible for any and all damages to property or injury to persons resulting from blasting, or accidental or premature explosions that may occur in connection with the use of explosives. Give adequate warning to all affected persons and adjacent property Owners prior to blasting.

Where excavations in hard, solid rock are to be made to depths of 10 feet or more, blasting thereof shall be done by the presplitting or preshearing method unless other methods are approved by Engineer.

205.03.02D Trench Blasting

When blasting rock in trenches, cover area to be shot with blasting mats or other approved type of protective material that will prevent scattering of rock fragments outside of the excavation.

205.03.03 Preservation of Existing Improvements

Conduct operations in such a manner that existing streets, utilities, railroad tracks, structures, and other facilities which are to remain in place will not be damaged, as specified in Section 105. Furnish and install cribbing and shoring, or whatever means are necessary to support material carrying existing facilities, or to support the facilities themselves, and maintain such supports until no longer needed.

Protect temporary facilities, until they are no longer required, and remove and dispose of temporary supports and other protective means when they are no longer required.

205.03.04 Excavation of Existing Improvements and Miscellaneous

Unless otherwise specifically provided for, excavation or excavation and backfill includes all excavating, removing, hauling, and depositing, including but not limited to, existing pavements, walks, driveways, surfaces, slabs, curbs, gutters, and similar cement concrete structures, bituminous materials, all rock or gravel road surfacing materials, abandoned sewers, pipes and conduits, logs, piling, footings, foundations, vaults, and chambers, when such materials are within the limits of excavation.

Remove remaining ends of abandoned pipes, or portions of other items partially removed under this work, which would be left exposed after final excavation, to a minimum of one (1) foot below the

finished grade or elevation. Plug or seal ends of abandoned pipes in backfill or embankment areas. Storm drain pipe shall be reconnected as directed by the Engineer.

Payment for all work in this section and repair of any damage will be considered incidental to the work and included under bid items for Excavation, Excavation and Backfill, or other specified earthwork items.

205.03.05 Limits of Excavation

Excavate to the depths and widths designated, allowing for forms, shoring, working space, base material, and finish topsoil where required. Do not excavate deeper than elevation shown. Excavation carried below grade lines shown or established without approval shall be replaced with compacted foundation stabilization material at the Contractor's expense. Over-excavation under footings shall be filled with concrete of a strength equal to that of the footing, and cuts below grade shall be corrected by similarly cutting adjoining areas and creating a smooth transition, all at the Contractor's expense. When the precise location of subsurface structures is unknown, locate such structures by hand excavation prior to utilizing mechanical excavation equipment.

205.03.06 Slope Grading

Make slopes free of all exposed roots, unstable rock, and loose stones exceeding 3 inches in any dimension. Shape tops of banks to circular curves with, in general, not less than a 6-foot radius, unless rock makes such work impractical. All surfaces shall be neatly and smoothly trimmed.

205.03.07 Foundation Stabilization

If, in the judgment of the Engineer, material in the bottom of an excavation is unsuitable for supporting foundations, piers, retaining walls, cribbing, sewers, pipes, or similar facilities, over-excavate as directed and backfill to required grade with thoroughly compacted foundation stabilization material conforming to Subsection 205.02.02.

205.03.08 Over-Excavation

Remove unsuitable subgrade material (correct soft spots) as directed. Excavation below subgrade shall be of the same classification as that above subgrade provided it is removed in the same operation as the excavation above subgrade. When the roadway excavation has been completed and it is required to move equipment in to excavate unsuitable material, or where special equipment is required, the work shall be performed as directed and will be paid for as over-excavation.

Excavations made below grade without authorization shall be restored to grade by the Contractor, as directed, at no expense to the Owner.

Remove any material which is excavated, displaced, or loosened outside and beyond the required slopes, lines, or grades, regardless of whether the overbreak is due to blasting, to the inherent character of any formation encountered, or to any other cause. Removal and disposal of overbreak, and replacement with approved materials, shall be by the Contractor at no expense to the Owner except in cases where the Engineer determines that such overbreak was unavoidable. The Contractor is responsible for soft spots due to failure to provide adequate dewatering as specified in subsection 205.03.13 for dewatering.

205.03.09 Disposal of Excess Material

Excavated materials not suitable or not required for backfill or embankment shall be deposited at predesignated sites specified or sites supplied by the Contractor. An embankment permit may be necessary within the City of Newberg for any embankment exceeding 50 yards before the Contractor places any excavated material from Owner projects on any property. The Contractor shall make all arrangements for disposal of excess material, obtain the necessary permits when not provided by the Owner at predesignated sites, and bear all cost or retain any profit incidental to such disposal. The Contractor shall inform the Engineer of disposal sites and provide letters of acceptance of excess material from the Owners of disposal sites. Proper documentation on disposal of excavated material is required.

205.03.10 Temporary Location of Excavated Materials

Place excavated material, specified for embankment or backfills and not excess material, only within the construction easement, right-of-way, or specified working area. Pile in such a manner that it will cause a minimum of inconvenience to the public. Furnish the Engineer a copy of written approval from each property Owner prior to stockpiling material on private property outside of easements. Conform to all Federal, State, and local codes governing the safe loading of trenches with excavated material.

Provide free access to all fire hydrants, water valves, and meters, and leave clearance to enable free flow of storm water in all gutters, conduits, and natural watercourses.

205.03.11 Surface Removal and Replacement for Trenches

205.03.11A Removal and Replacement of Topsoil

When specified and where trenches within easements cross lawns, garden areas, pasture lands, cultivated fields, or other areas on which topsoil conditions exist, remove all topsoil to a depth of at least 12 inches for the full width of the trench to be excavated. Stockpile topsoil to one side of the easement in a location and do not mix with remaining excavated material. Replace and compact removed topsoil in the top of backfilled trench to the depth removed.

Maintain finished grade of topsoil level with area adjacent to the trench until final acceptance by the Engineer. Repair damage to adjacent topsoil caused by work operations. Remove all rock, gravel, clay, and any other foreign materials from surface; regrade, and add topsoil as required.

In lieu of stockpiling topsoil, Imported Topsoil as defined in Subsection 205.02.07 may be substituted and replaced to the actual depth removed at the Contractor's expense. If, in the opinion of the Engineer, the Contractor does not take precautions to protect the stockpiled topsoil from contamination by rocks, clay, excess water, etc., the Contractor will import topsoil meeting the requirements of Section 205.02.07 at his own expense.

Payment for removing, stockpiling, and replacing topsoil in the trench is included in the bid item, Trench Excavation and Backfill.

205.03.11B Removal of Pavement, Curbs, Driveways, and Sidewalks

Cut all asphalt pavement to full depth with a pavement saw or other suitable pavement cutter prior to excavation of trenches.

Saw Portland Cement concrete pavement, curbs, and sidewalks to a minimum depth of four (4) inches or half the concrete thickness, whichever is greater. Subsequent removal may be accomplished by using a jackhammer. Full depth cut by pavement saw can be done at the option of the Contractor. Use of any machine utilizing a falling or swinging weight in the form of a "headache ball" will not be permitted.

Width of cut shall be as shown on the plans or standard drawings. Remove all loose, undermined or damaged pavement. Remove all pavement between the trench and curb, pavement edge or construction joint whenever the cut is two (2) feet or less from the curb, pavement edge, or construction joint. Prior to paving, all loose, cracked, sunken or otherwise damaged edges will be saw cut in continuous straight cuts. Straight line saw cut lengths will not be less than 50 feet. Cut angles will not exceed 15 degrees.

Pavement and concrete materials removed shall be hauled from the site and not used for trench backfill. Replacement of pavement, curb, and sidewalk shall conform to the requirements of Subsection 212 RESURFACING.

205.03.12 Trench Excavation and Shoring

205.03.12A Maximum Length of Open Trench

Length of trench excavated in advance of the pipe laying shall be kept to a minimum, and in no case shall it exceed two hundred (200) feet unless otherwise authorized. The length of unrestored work area and total unfinished trench construction shall not exceed a length of 800 feet, for each main line pipe laying operation unless otherwise authorized. Trench construction will not be considered completed until all restoration is completed. If the unfinished trench or restoration exceeds 800 feet in length, the main line construction shall be suspended and shall not be resumed until authorized by the Engineer.

In no case will any trench be left unfinished or uncovered overnight or outside working hours.

A section of trench shall be considered as unfinished until excavation, construction, backfilling, compaction, gravel road restoration, Portland Cement concrete pavement, minimum of first lift of asphaltic concrete pavement or cold patch, and cleanup operations have been completed. Cleanup of backfilled and construction area shall include resurfacing and cleaning of area so as to allow use of trench and adjacent construction area for normal use as required in Section 208 RESTORATION AND CLEANUP.

205.03.12B Trench Width

The maximum trench width at the ground surface will be kept to a minimum necessary to install the pipe in a safe manner. Trenches shall be of sufficient width to allow for shoring and permit proper joining of pipe and compaction of the backfill material along the sides of the pipe. Minimum trench width of unsheeted trenches shall provide a clear working space of at least six inches on each side of the outside diameter of the pipe bell. Sheeting requirements shall be independent of trench widths.

Trench width at the top of the pipe will be the pipe I.D. plus 18 inches, except where specifically shown on the Drawings, or specified in the Special Specifications. The pipe will be centered in the trench on line and grade at all times. When authorized by the Engineer, the Contractor may use pipe of greater strength or install a superior pipe bedding in lieu of maintaining the trench widths shown. If maximum width shown is exceeded by Contractor (without written authorization), the Contractor shall provide pipe of a higher strength designation, a higher class of bedding, or both, as approved by the Engineer, at no expense to the Owner.

Make the excavation for manholes and other structures wide enough to provide a minimum of twelve (12) inches between sides of structure and sides of excavation.

Confine top width of trench to dedicated rights-of-way or construction easements. Special written agreements to extend width may be made by the Contractor with affected property Owners, provided such agreements are approved by the Engineer.

205.03.12C Grade

Excavate trench to lines and grades shown or as established by the Engineer, with proper allowance for pipe thickness, pipe bedding, and foundation stabilization. The subgrade upon which bedding is to be placed shall be firm, undisturbed, and true to grade. If the trench is over-excavated, restore to grade with thoroughly compacted foundation stabilization material or pipe bedding material at the Contractor's expense. Place material over full width of the trench in compacted layers to established grade with allowance for pipe bedding.

205.03.12D Shoring, Sheeting, and Bracing of Trenches

Sheet and brace trench when necessary to prevent caving and to protect adjacent structures, property, workers, and the public. Increase trench widths by the thickness of the sheet and maintain sheeting until pipe has been placed and backfilled at the pipe zone. Remove shoring and sheeting as backfilling is done, in a manner that will not damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the Federal, State, or local agency having jurisdiction. The most stringent of these requirements shall apply.

205.03.13 Dewatering

Furnish, install, and operate all necessary machinery, appliances, and equipment to keep excavations free from water during construction. Remove and dispose of all water entering the trench excavation continuously during the time the trench is being prepared for the pipe laying, during the pipe laying, when concrete is being placed, and until the backfill has been completed. Dewater and dispose of water so as to prevent injury to public or private property, or nuisance or menace to the public. Drainage of trench water through the pipeline under construction is prohibited unless otherwise approved by the Engineer. At all times have on hand sufficient pumping equipment and machinery in good working condition for all ordinary emergencies, including power outage. Have available at all times competent workers for operation of the pumping equipment. Control surface runoff to prevent entry or collection of water in excavations.

Control ground water such that softening of the bottom of excavations or formation of "quick" conditions or "boils" during excavation shall be prevented. Design and operate dewatering systems so as to prevent removal of natural soils and so that ground water level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

Before dewatering is started, submit to the Engineer a statement of the method, installation, and details of the dewatering system proposed to be used. Open and cased sumps shall not be used as primary dewatering for excavations deeper than 3 feet below static water table.

Release ground water to its static level in such a manner as to maintain the undisturbed state of natural foundation soils. Prevent disturbance of compacted backfill and flotation or movement of structures, water mains, sewers, and other utilities.

Dewatering shall be considered as incidental to, and all costs included in, the various contract pay items in the Proposal.

205.03.14 Compaction

Compaction shall be by mechanical methods only.

Compaction equipment shall be of suitable type and adequate to obtain the amount of compaction specified. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations and shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort. Compaction equipment for granular materials shall be vibratory plate or vibratory drum compactors.

Any settlement noted in backfill, embankment, or in structures built over the backfill or embankment within the 2-year warranty period in accordance with the GENERAL REQUIREMENTS will be considered to be caused by improper compaction methods and shall be corrected at the Contractor's expense. Structures damaged by settlement shall be restored to their original condition by the Contractor at the Contractor's expense.

205.03.15 Embankment

205.03.15A Roadway Embankment

Preparation of Embankment Foundations:

Prior to construction of embankments, excavate and dispose of unstable material or unsuitable foundation material. Limit excavation to lines, grades, and cross sections shown. Backfill basements, trenches, and holes which occur within embankment limits with specified material. Break up and roughen the ground surface before embankment material is placed. Compact natural ground underlying embankments to the depth of grubbing or a minimum of 12 inches to density specified for the embankment material to be placed.

Embankment Construction:

Construct embankments to the lines and grades shown. Deposit material in layers not exceeding 8 inches deep across the full width of the embankment. Place material in continuous

horizontal layers. Compact each lift to at least 95 percent of maximum dry density as determined by ASTM D-1557/AASHTO T-180.

In embankments, the compacted materials within 3 feet of established subgrade elevation shall have a density in place of not less than 95% of relative maximum density, and below 3 feet shall have a density in place of not less than 90% of relative maximum density, and will show no appreciable deflection or adverse reaction under the compacting equipment during compaction.

If the surface of the prepared foundation or the compacted surface of a preceding lift is too dry or smooth to bond properly with the next layer of material, moisten or scarify, or both, before the next layer of material is placed. Compact slopes of all embankments thoroughly, and true to line and grade.

Do not place embankment material when the material, foundation, or previously placed embankment material is frozen. Embankment material shall not be placed in final position until moisture in excess of optimum moisture has been removed. Water settling of embankments will not be permitted.

Slide Removal and Repair:

When a slope slides back of the finished slope line or out of an embankment, remove the slide material or replace the embankment and refinish the slope as directed. Slopes undercut at the base, disturbed or made unstable through negligence shall be restored at no cost to the Owner.

Finishing Roadbed and Slopes:

Perform special grading on areas which are shown as planting areas. The Contractor shall finish planting areas to smooth flowing lines and to the grades and cross sections established or approved. Rock, boulders, vegetative matter, and other objectionable debris shall be removed as directed.

Blend the tops of cut banks with the adjacent terrain. Trim all roadbeds, ditches, and other excavations and embankments to the established lines, grades, and cross sections. All surface features shall be left in a neat and well-finished condition.

Backfill holes resulting from grubbing, removal work, basements, and trenches which lie outside the limits of required excavation or embankment construction with approved roadbed excavation material. The fill shall be smoothed and shaped to blend with the surrounding area.

Immediately prior to completion of the earthwork, clean the entire work area of debris and foreign matter.

205.03.15B Pipeline Embankment

Where pipelines are to be placed within an embankment, construct the embankment to its final specified elevation prior to trench excavation for the pipeline. Place pipe bedding and pipe zone materials in accordance with applicable portions of Subsection 205.03.16 and 205.03.17. Place trench backfill material as specified in Subsection 205.03.18 for TRENCH BACKFILL AND COMPACTION.

Additional Pipe Cover:

In locations where insufficient pipe cover exists, place excess excavated trench material suitable for embankment over the pipe to provide a minimum cover of 3 feet. Compact as required for underlying trench backfill.

205.03.15C Embankment for Structural Foundations

Deposit specified materials free from roots, organic material, trash, and stones larger than 3-inch diameter in uniform lifts across the full width of the embankment. Compact each lift to 95 percent of maximum dry density as determined by ASTM D-1557/AASHTO T-180.

205.03.16 Pipe or Conduit Pipe Zone Bedding

Construct bedding in conformance with the appropriate Standard Drawing.

Class A pipe zone bedding consists of a pipe cradle of Portland Cement concrete as shown on the appropriate Standard Drawing. Bottom of trench shall be fully compacted before placement of pipe or cradle. Place concrete in such a manner that no dirt or foreign material become mixed with the concrete. Allow concrete sufficient time to reach initial set before any additional backfill material is placed in the trench. Conform to applicable provisions for Concrete Encasement in DIVISIONS 3 and 6 - SANITARY SEWERS and STORM DRAINS.

Class B pipe zone bedding consists of leveling the bottom of the trench or top of the foundation material and placing pipe bedding select material to the horizontal centerline (springline) of the pipe. Bedding select material shall be placed in at least two lifts. Place the first lift to provide the minimum depth of bedding select material shown on the appropriate Standard Drawing before the pipe is installed. Spread smoothly to proper grade so that pipe is uniformly supported along the barrel. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint. Bedding under pipe shall provide a firm, unyielding support along the entire pipe length. Place subsequent lifts of not more than 6 inches thickness up to the horizontal centerline of the pipe. Bring lifts up together on both sides of the pipe and carefully work under pipe haunches.

Class A, B, and C pipe zone bedding shall be considered to include full width of excavated trench from the bottom of the trench or top of the foundation stabilization material to the top of the bedding.

Particular attention must be given to the area from the invert to the horizontal centerline of the pipe or top of the bedding to ensure that firm support is obtained to prevent any lateral movement of the pipe during the final backfilling of the pipe zone.

205.03.16A Bedding for Flexible Sewer Pipe

Material for bedding sewer pipe shall be as specified. Place in more than one lift. Material for pipe bedding PVC pipe shall be ¾" - 0" or crushed rock placed a minimum of 6" under the pipe to 6" over the top of the pipe. First lift shall provide the minimum thickness per Standard Drawing No. 202 under any portion of the pipe or 4", whichever is greater, and be placed before the pipe is installed. Spread smoothly so that the pipe is uniformly supported along the barrel. Install subsequent lifts of not more than 6 inch thickness to the top of pipe zone and individually compact to either 90 percent density as determined by AASHTO T-180 (delete paragraph 5.1), or 70 percent relative density as determined by ASTM D-2049. Engineer will select test method appropriate for material used.

205.03.16B Bedding for Water Pipe

Place bedding to a minimum thickness of 6 inches below the outside bottom of the pipe barrel or conduit and compact with mechanical vibrating or impact tampers to 95 percent of maximum density as determined by AASHTO T-180 (delete paragraph 5.1), or 70 percent relative density, as determined by ASTM D-2049. Engineer will select test method appropriate for material used. For coal tar coated steel pipe, ¾" - 0" bedding material is not acceptable.

205.03.17 Pipe Zone Placement

Place pipe zone material carefully around the pipe in 6-inch layers and compact to a minimum of 90 percent maximum dry density as determined by ASTM D-1557/AASHTO T-180. Pipe zone material for water pipe shall be compacted to a minimum of 95 percent of maximum dry density as determined by ASTM D-1557/ AASHTO T-180. Prevent pipe from movement either horizontally or vertically during placement and compaction of pipe zone material.

205.03.18 Trench Backfill and Compaction

205.03.18A General

For bidding purposes, the type of backfill to be used above the pipe zone is indicated on the Drawings. The right is reserved to modify the use, location, and quantities of the type of backfill

during construction as the Engineer considers to be in the best interest of the Owner. Payment will be made based on the type of backfill installed.

Trench backfill above the pipe zone will be either imported or native for the purpose of payment:

Select and Approved Granular Native Backfill will, generally, be limited to streets and roadways and in similar areas where subsequent trench settlement must be held to a minimum. The Engineer will make the determination of acceptability of the granular native materials.

Native backfill will, generally, be limited to use in unsurfaced or unimproved areas.

When backfill is placed mechanically, push the backfill material onto the slope of the backfill previously placed and allow to slide down into the trench. Do not push backfill into the trench in such a way as to permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Under no circumstances allow sharp, heavy pieces of material to drop directly onto the pipe or the tamped material around the pipe. Do not use backfill material larger than 6 inches in any dimension.

Take reasonable precautions to prevent excavated material which is designated to be used for backfill from becoming wet and exceeding the critical moisture limits. If native material does become wet and exceeds the critical moisture limits due to the Contractor's operations, replace with imported granular material at the Contractor's expense.

205.03.18B Select Backfill

Backfill the trench above the pipe zone with imported granular backfill material. Compact the entire trench depth in suitable lifts not to exceed 18 inches in depth with mechanical vibrating compactors with sufficient compactive effort to meet the specified density. Determine the type of equipment, method of placing lifts, and the amount of compacting effort required to prevent subsequent settlement. Compaction with hydrahammer equipment will not be approved.

The top 3 feet of select backfill shall be compacted to 95 percent of maximum relative density as determined by ASTM D-4253 and D4254 for bar-run or river-run gravels. For one (1) inch-minus crushed aggregate, compact to 95 percent of maximum dry density as determined by ASTM D-1557/AASHTO T-180.

In the zone below the top 3 feet of backfill, except water line trenches, compact to 90 percent of maximum dry density as determined by ASTM D-1557/AASHTO T-180.

Any subsequent settlement of the finished surface during the warranty period shall be considered to be a result of improper or insufficient compaction and shall be promptly repaired by the Contractor at the Contractor's expense. The trench backfill material shall be ¾“-0" to 1½”-0" clean uniformly graded crushed rock.

205.03.18C Native Backfill

Backfill the trench above the pipe zone with excavated trench material.

In untraveled areas and as shown on the Construction Drawings, leave the trench with the backfill material level with the existing ground for the entire width of the trench. Material will be compacted to a minimum of 85 percent maximum dry density as determined by ASTM D-1557/AASHTO T-180. Any deficiency of backfill material which becomes apparent after settlement and within the warranty period shall be corrected by regrading, and adding additional material where required. Unless otherwise directed by Subsection 205.03.11A, remove rocks larger than 2 inches in any dimension from the upper 8 inches of the backfill.

205.03.18D Compaction Testing

The Contractor shall provide a 48-hour notice for the Owner personnel to witness compaction tests. All test results (pass or fail) shall be furnished to the Owner.

Sampling and testing of materials for determination of compliance with the specified compaction requirements may be taken at any location and time as the Engineer may determine. Excavate test pits in the backfill as directed by the Engineer for the purpose of testing the backfill compaction. At the option of the Engineer, density tests may be taken on a lift of compacted backfill immediately before placing the next lift. All costs in connection with excavating test pits, providing and installing safety shoring as required to protect the testing person, and standby time during field density test shall be considered incidental to backfill and shall be included in unit prices bid for the various items involved.

When compaction testing has been performed in the presence of the Engineer and the required density has not been obtained by the Contractor, the Contractor shall bear all costs for all subsequent retesting in the areas of non-compliance. All testing shall be performed by the testing laboratory in the presence of the Engineer. The Contractor shall keep an accurate account of the time spent for the testing laboratory to perform retesting. The Contractor shall be totally responsible for rescheduling compaction testing and notify the Engineer two days ahead of compaction tests. Any and all tests associated with delays due to retesting shall be the sole responsibility of the Contractor.

If required density has not been obtained, remove the backfill from the trench, replace with backfill, and recompact as many times as it is necessary to obtain the required specified minimum densities.

205.03.18E Trench Maintenance

In graveled areas, maintain surface of the backfilled trench level with the adjacent and existing grade, before and after the area is opened to traffic, with 1-inch minus crushed aggregate material. In paved areas, cold mix asphalt pavement shall be used until the final pavement replacement is completed. The cold mix asphalt or steel plating shall be in place at the end of each workday.
Place cold mix asphalt in conformance with Section 210 RESURFACING.

Maintain backfilled trench surface between any two successive manholes until the following operations have been completed and accepted by the Engineer:

1. Service connections installed, backfilled, and compacted.
2. Construction of manholes and appurtenances.
3. Air testing.
4. Cleanup and restoration of all physical features, including concrete curbs, gutters, and driveways.
5. Utilities restored to their original condition or better.
6. All work required between the two manholes accomplished.

Maintain backfilled trench surface between any two successive valves until the following operations have been completed and accepted by the Engineer:

1. Service connections installed, backfilled, and compacted.
2. Valves, valve boxes, and hydrants installed.
3. Hydrostatic testing.
4. Flushing and disinfection.
5. Cleanup and restoration of all physical features, including concrete curbs, gutters, and driveways.
6. Utilities restored to their original condition or better.
7. All work required between the two valves accomplished.

Do not undertake final pavement replacement until all items outlined above have been completed and accepted.

Maintenance of backfilled trenches is considered as incidental to this item of work, and payment for such maintenance will be considered as included in payment for Excavation and Backfill.

205.04 MEASUREMENT AND PAYMENT

205.04.01 Unclassified Excavation

All unclassified excavation will be measured on a cubic yard basis, or on a linear foot basis for trench excavation and backfill when so shown in the Proposal, all in original position prior to excavation. The quantity measured for payment will include only material excavated from within the limits defined herein. Any additional excavation outside of these limits, unless ordered in writing by the Engineer, shall be considered as having been made for Contractor's benefit and will be considered as incidental to the work. Excavation required for the volume displaced by new concrete curbs, driveway, sidewalks, steps, and pathways shall be considered incidental to the work and no payment will be made for removal of this material.

205.04.01A Roadbed and Slope Excavation

Pay quantities shall be computed to the neat lines of cross sections as staked or as otherwise specified.

205.04.01B Trench Excavation and Backfill

General

Length of all trenches will be measured horizontally along center of pipe or conduit from center-to-center of valves, fittings, couplings, manholes, structures, or end of pipe or conduit, whichever is applicable. Measurement through structures will be deducted if the Proposal carries a separate item of structure excavation applicable to the structures.

Measurement and payment for trench excavation and backfill shall include all work specified herein, or not specifically paid for in other pay items. No separate measurement and payment for trench excavation and native backfill shall be made for waterline projects. See Division 4, Subsection 404.01.

The price per linear foot for trench excavation and backfill shall be considered full compensation for the removal, protection, and replacement if damaged or interfering portions of existing sewers, storm drains, waterlines and other improvements; the plugging or removing of abandoned conduit and structures; the excavations of the trench; disposal of excess excavation; the control of ground and surface waters; the preparation of subgrade; backfilling the trench; removing, stockpiling, and replacing topsoil; and all other work necessary to install the pipe or conduit, complete in place.

Gravity Sanitary Sewers and Storm Drains

When contained in the Proposal, trench excavation and backfill will be paid for on a linear foot basis for type and depth of backfill used, with depth being measured from original ground or paved surface to invert of the pipe. The price bid per linear foot shall include the excavation required to provide space for the pipe bedding and any excavation and backfill necessary to widen the trench for installation of manholes and appurtenances.

For sanitary sewers and storm drains, depth figures shown in the Proposal are inclusive to the nearest 0.1 foot, that is, a trench depth measured as 11.9 feet will be paid for at the unit price for excavation 10 to 12 feet deep. At trench depth measured as 12.0 feet will be paid for at the unit price for excavation 12 to 14 feet deep. Depths measured at less than 8 feet will be included in the base depth of range of zero to 8 feet. Depth of trench will be measured at intervals of 50 feet along the centerline of the trench, and the ends. Depths will be interpolated between each 50-foot station or the ends if the line is less than 50 feet long.

Pressure Sewers, Waterlines, and Conduits

Payment for trench excavation and backfill will be made at the respective unit prices per linear foot stated in the Proposal for the trench excavation, the type of backfill used, and all incidental work, including all extra excavation required to provide space for pipe bedding and shall also include any incidental excavation and backfill necessary to widen the trench for installation of branch-line fittings and appurtenances.

For waterline installations, payment for trench excavation and native backfill will be included within the "Installation of Pipe" (Subsection 404.01) bid item.

205.04.01C Imported Select Backfill

If a portion of the native material is approved as a granular backfill material in areas requiring such, there may be a need for additional granular backfill to be imported. Compensation will be on a cubic yard ("neat-line", in place) or linear foot basis.

All projects where select backfill is used in the trench section, payment shall be by the cubic yard unit price in place. The units shall be computed by multiplying the neat width of the trench, as defined by Standard Drawings, times the depth of the backfill between the asphalt concrete restoration section and the pipe zone, times the horizontal length of the trench to which the backfill is added. If all dimensions are in feet, divide the resulting volume by twenty-seven (27) for cubic yards.

205.04.02 Rock Excavation

205.04.02A Structural Rock Excavation

Rock excavation will be measured on a cubic yard basis for the actual quantity removed within the limits of excavation as defined for unclassified excavation. Quantity for payment shall be the amount approved by the Engineer.

205.04.02B Roadbed and Slope Rock Excavation

Rock excavation will be measured on a cubic yard basis for the actual quantity removed within the limits of excavation as defined for unclassified excavation. Quantity for payment shall be the amount approved by the Engineer.

205.04.02C Trench Rock Excavation

Rock excavation will be measured on a cubic yard basis as follows:

Length

Length will be the entire horizontal distance where rock is encountered measured on a linear foot basis along the centerline of the trench.

In sewer trenches, manholes and other structures will be excluded and will be measured separately. Measurement will commence at the first location where rock is encountered and continue to the point where rock terminates.

In trenches for water mains, valves, fittings, couplings, or structure locations will be included in the linear measurement, unless the Proposal carries a separate item that is applicable to the structures.

Width

For sewers and water mains, the width for payment of trench rock excavation shall be the inside pipe diameter plus two (2) feet.

Depth

Measurement for depth will be the vertical distance from the top of the rock to the bottom of the rock or a depth that is 6 inches below the sewer pipe or watermain, whichever is less. Depth will be measured at intervals of 25 feet for sewers and 50 feet for water mains along the centerline of the trench, beginning at the first location that rock is encountered, and the average depth between measuring points will be the depth used for computing depth of rock.

Payment for rock excavation will be based on the unit price per cubic yard stated in the Bid and will be paid in addition to the payment for trench excavation and backfill except for water mains,

where the volume paid for rock excavation will be deducted from the volume paid for common trench excavation. Payment for rock excavation shall include full compensation for all work necessary to excavate the rock material. No payment will be made for rock excavated below the required grade or outside the widths mentioned above.

Rock excavation quantities for manholes and other structures shall be computed from the actual profile depth as above, multiplied by the area within a line parallel to and one foot outside of the actual outside dimensions of the manhole or structure base.

205.04.03 Hard Surface Removal and Replacement for Trenches

Measurement and payment for the removal and replacement of Portland Cement concrete pavement, asphaltic concrete pavement and surfaces, curbs, driveways, and sidewalks shall conform to the provisions of Section 210 RESURFACING.

Payment for removal will be covered under excavation unless specifically stated otherwise in this document.

205.04.04 Embankment

Measurement for payment for embankment compacted in place will be made on a cubic yard basis. Computation of volume for payment will be based on field measurement of the actual number of cubic yards constructed within limits shown or directed. Where applicable, this shall be within neat lines of the staked cross section.

No payment will be made for quantities required due to subsidence or settlement of ground or foundation, for settlement of materials within the embankment or for shrinkage, settlement, washout, slippage, or loss regardless of cause, subject however to the provisions of RESPONSIBILITY OF CONTRACTOR in Section 105 of the GENERAL REQUIREMENTS.

No deduction will be made for piers, columns, pipes, or miscellaneous construction features constructed within embankment limits.

Payment shall constitute full compensation for all work and all materials used, whether obtained from the site of work or imported.

Trench excavation, bedding, and backfill placed in the compacted embankment will be paid for separately for the particular item and class of construction.

205.04.05 Foundation Stabilization

Payment for this item will be based on the unit price per cubic yard stated in the Proposal. Measurement will be based upon a trench pay width of the inside pipe diameter plus two (2) feet. Payment for this item shall constitute full compensation for all materials, labor, equipment, and incidentals necessary to furnish materials at the site and for placing and compacting it and for the extra depth of excavation required below the pipe base grade structure or roadway to provide for a stable base. This item is to provide for unstable base encountered in the progress of the work and shall be used only under the direction of the Engineer. Foundation stabilization will only be paid in those areas where the Engineer has given written direction for installation.

205.04.06 Over-Excavation

When listed in the bid schedule, over-excavation will be measured and paid for on a cubic yard in-place basis, to the nearest 0.1 yard. When not listed in the bid schedule, over-excavation will be paid for as extra work. However Contractor shall obtain authorization prior to any over-excavation.

205.04.07 Bedding for Sewers, Water Mains, and Conduits

Payment for pipe bedding will be included in the linear foot payment for pipe as specified in Section 301 and/or Section 404.

205.04.08 Pipe Zone Backfill

Payment for pipe zone backfill will be included in the linear foot payment for pipe as specified in Section 301 and/or Section 404.

205.04.09 Riprap and Filter Blanket

Riprap and filter blanket material will be measured for payment on a cubic yard or ton basis only when listed in the Proposal as a separate bid item, or when directed by the Engineer. Measurement will be based upon individual trip tickets of actual truck measure furnished to the Engineer for the cubic yards or tons used under this item. Trip tickets shall be presented to the Engineer for signature on the day the material is delivered. No payment will be allowed on trip tickets not so validated by the Engineer.

Payment for riprap and filter blanket shall include all work necessary to furnish and place the material complete. When not listed in the Proposal, payment for riprap and filter blanket shall be incidental to other items of work.

205.04.10 Imported Topsoil

Measurement and payment for the imported topsoil will be made on a cubic yard or ton basis and only when listed in the Proposal as a separate bid item. Measurement will be based upon individual trip tickets of actual truck measure furnished to the Engineer for the cubic yards or tons used under this item. Trip tickets shall be presented to the Engineer for signature on the day the material is delivered. No payment will be allowed on trip tickets not so validated by the Engineer.

Payment for imported topsoil shall constitute full compensation for all work necessary to furnish materials on site, placing material, and for full compaction in place.

205.04.11 Shoring, Sheeting, and Bracing

Shoring, sheeting, and cribbing, including all work and materials expended in furnishing, placing, and removing such shoring, sheeting, and cribbing necessary to complete the excavation shall be considered incidental to the pay item for excavation.

205.04.12 Dewatering

Dewatering shall be considered as incidental to and included in the pay item for excavation.

****

206 MATERIALS - TYPES AND USE

****

206.01 DESCRIPTION

This section covers certain types of materials and their use that are common to appropriate forms of construction contained throughout Divisions 3 through 6.

206.02 MATERIALS

206.02.01 General

Unless specified otherwise in the Contract Documents or Standard Drawings, materials contained herein will be used in required work.

206.02.02 Portland Cement Concrete

Use concrete having a 28 day design strength of 3,300 PSI for curbs, sidewalks, and poured in place manholes and catch basins, and 4,000 PSI for PCC pavement per AASHTO T-22 and T-23 with 1-inch maximum size aggregate.

High early strength concrete (Type III cement) shall be used when patching trenches in Portland Cement concrete pavement.

Use Type II cement concrete for all sewer and water main construction and appurtenances thereto.

Portland Cement concrete shall be sampled and tested in accordance with the following ASTM test methods:

Sampling Fresh Concrete	C-172
Obtaining Drilled Cores	C-42
Molding and Curing Specimens	C-31
Compressive Strength	C-39
Flexural Strength	C-78
Slump	C-143
Air Content	C-173 or C-231
Unit Weight Yield	C-138
Setting of Mortar	C-191 or C-266

206.02.03 Cement Mortar

Use either standard premixed mortar conforming to ASTM C-87, or mortar proportioned with 1 part Portland Cement to 2 parts clean, well-graded sand which passes a 1/8-inch screen and which conforms to AASHTO M-45. Admixtures may be used, but do not exceed the following percentages of cement by weight: Hydrated lime - 10 percent and diatomaceous earth or other inert materials - 5 percent. Testing shall conform to the OSHD test for mortar strength.

206.02.04 Cement Grout

206.02.04A Type "A" Grout

Utilize grout which consists of 1 part Portland Cement, 3 parts of clean and well-graded sand. Use minimum amount of water to produce a thick, creamy consistency.

206.02.04B Type "B" Grout

Where type "B" grout is specified, use a mixture consisting of 1 part Portland Cement, 5 parts of clean and well-graded sand, and 7 parts pea gravel, by volume.

206.02.05 Steel Reinforcement

Use steel deformed bars conforming to ASTM A-615, Grade 40, except that longitudinal bars in continuously reinforced concrete pavement shall be Grade 60. See Section 702 REINFORCEMENT.

206.02.06 Dowels

Utilize steel dowels which conform to ASTM A-306 Grade 70. Where specified, dowels shall be coated with plastic or other approved material for bond prevention. See Section 702 REINFORCEMENT.

206.02.07 Structural Joint Material

Use preformed and poured joint fillers conforming to requirements of Subsection 701.02.06 JOINT MATERIALS. For joints in Portland Cement concrete pavement, curbs, gutters, driveways, sidewalks, and pathways, refer to DIVISION 5 - STREETS.

206.02.08 Curing Materials for Portland Cement Concrete

Conform to one or more of the following requirements for curing materials; choice of method to be used is dependent on weather and existing conditions:

1.	White Burlap - Polyethylene Sheets	AASHTO M-171
2.	Waterproof Paler	AASHTO M-171
3.	White - Pigmented Liquid Membrane-Forming Compound**	AASHTO M-148
4.	White Polyethylene Film	AASHTO M-171
5.	Burlap Cloth (Jute or Kenaf)	AASHTO M-182

**Required for PCC curbs, but do not use on bridges or box culverts. Test in accordance with the OSHD modified procedure.

206.02.09 Epoxy Cement

Epoxy cement shall be a two-compound epoxy resin adhesive conforming to requirements of AASHTO M-235.

206.02.10 Portland Cement

Furnish one or more of the following types as specified:

Type I – For general use when special properties of other type cements are not required.

Type IA – Air-entraining cement for same uses as Type I, where air-entrainment is desired.

Type II – For use when moderate sulfate resistance or moderate heat of hydration is desired.

Type IIA – Air-entraining cement for same uses as Type II, where air-entrainment is desired.

Type III – For use when high early strength is desired.

Type IIIA – Air-entraining cement for same use as Type III, where air-entrainment is desired.

Portland Cement shall conform to AASHTO M-85 for low alkali cement except as follows:

1. Total alkali content (sodium and potassium oxide calculated as $Na_2O+0.658K_2O$) shall not exceed 0.6 percent.

2. Types I, IA, III, or IIIA must contain a maximum of 10 percent tricalcium aluminate.

3. Time-of-setting tests shall be by either the Gillmore Test or the Vicat Test or both.

When not otherwise specified, use Type I. Contractor, at his option, may use Type III Portland Cement (high early strength) in lieu of Type I in the identical quantity specified for the latter.

Differing brands or types of cement, or the same brand or type of cement from different plants shall not be mixed during use nor be used alternately. Cement may be sampled either at the plant or site of work at the option of the Engineer.

206.02.11 Water

Water used in all work must be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable matter, or other substances injurious to the finished product. Use water conforming to AASHTO T-26 for mixing and curing Portland Cement concrete, mortar, or grout. Water of approved potable quality may be used without test.

206.02.12 Aggregates

206.02.12A General

Aggregates shall be subject to approval at the source or at the actual stockpile from which the aggregate is taken for incorporation in the work. During production of the aggregate, provide samples of each size for testing if requested by the Engineer. On the basis of testing, modify or adjust crushing and screening operations to bring each separate size of aggregate within gradings, proportions, and quantities as specified.

In all stages of production, transporting, and stockpiling, handle aggregates in such a manner as will prevent the segregation of materials and the intermingling of separate gradings or kinds of aggregates.

Grading of designated aggregate sizes shall conform to the requirements of appropriate forms of work contained within applicable sections throughout these Specifications.

The determination of sizes and grading of aggregate shall conform to AASHTO T-27 and AASHTO T-11.

206.02.12B Coarse Aggregates

Coarse aggregates shall be natural or crushed rock or gravel which is retained on a No. 4 sieve and free from flat, elongated, soft, or disintegrated pieces, vegetable material, or other deleterious matter.

Use crushed rock or crushed gravel for coarse aggregate in aggregate bases and all asphalt construction requiring coarse aggregate. Total deleterious matter shall not exceed 2 percent by weight.

Use crushed rock, natural gravel, or other inert materials of similar characteristics, or combinations thereof, for coarse aggregate in Portland Cement concrete. Do not allow amount of deleterious substances in Portland Cement concrete to exceed the following amounts:

Lightweight pieces	0.25% (by weight)
Friable particles	0.25% (by weight)
Material passing No. 200 sieve	1.00% (by weight)
Wood waste	0.05% (by weight)

Use coarse aggregates having weighted percentages of loss which do not exceed 12 percent by weight when subjected to five alternations of the sodium sulfate soundness test (AASHTO T-104).

Fracture of Gravel

When crushed gravel is furnished, it shall have at least one mechanically fractured face on not less than the following percentages (by weight) of the material retained on a No. 4 sieve.

Type of Use	**Percentages**
Asphalt Concrete Pavement	75
Asphalt Surface Treatment	95
Asphalt Treated Bases	75
Aggregate Bases - 1"- 0" crushed gravel	70

Durability

The source material from which coarse aggregate is produced shall meet the following qualifying test requirements:

Test	**Test Method**	**Requirements**
Degradation:		
Passing No. 20 sieve	ODOT Standard	30% maximum
Sediment Height	ODOT Standard	3” maximum
Abrasion	AASHTO T-96	35% maximum

Also, other sampling and testing of coarse aggregate shall be in accordance with the following methods:

Sampling	AASHTO T-2
Materials Passing No. 200 sieve	AASHTO T-11
Sieve Analysis	AASHTO T-27
Soundness	AASHTO T-104
Friable Particles	AASHTO T-112
Lightweight Pieces	AASHTO T-113
Fracture	ODOT Standard

206.02.12C Fine Aggregate

Use fine aggregate consisting of finely crushed rock or gravel, fine sand, and other finely divided natural and inert mineral matter, thoroughly washed, and free of clay, loam, shale, alkali, vegetable matter, and other deleterious matter. Do not mix fine aggregate from different geological sources, and do not store in the same pile nor use alternately in the same class of construction or mix.

Portland Cement concrete shall contain fine aggregate which has a deleterious material content not exceeding the following limits:

Friable Particles	1% (by weight)
Lightweight Particles	1% (by weight)
Material Passing No. 200 Sieve	1% (by weight)

When this fine aggregate for Portland Cement concrete is subject to five alternations of the sodium sulfate soundness test (AASHTO T-104), weighted percentage of loss must not exceed 10 percent by weight.

Asphalt cement concrete and surface treatments shall contain fine aggregate having a weighted loss of not more than 15 mass percent when sodium sulfate is used or 20 mass percent when magnesium sulfate is used in five cycles of the soundness test. Total deleterious matter shall not exceed 2 percent by weight.

Use fine aggregates which meet the durability requirements for coarse aggregates contained hereinbefore, and which meet the following Liquid Limit and Plasticity Index requirements:

Quality	Test Method	Requirement
Liquid Limit	AASHTO T-89	NP or 33 Max.*
Plasticity Index	AASHTO T-90	NP or 6 Max.*

*When tested as specified, both the liquid limit and the plasticity index test results shall conform to the following:

Percent of Material Passing No. 40 Sieve	AASHTO T-89 Liquid Limit (Maximum)	AASHTO T-90 Plasticity Index (Maximum)
0.0 to 5.5, inclusive	33	6
5.1 to 10.0, inclusive	30	5
10.1 to 15.0, inclusive	27	4
15.1 to 20.0, inclusive	24	3
20.1 to 25.0, inclusive	21	2
Over 25.0	21	O or N.P.

Sampling and testing fine aggregate shall conform to the following methods:

1.	Sampling	AASHTO T-2
2.	Material Passing No. 200 Sieve	AASHTO T-11

3	Organic Impurities	AASHTO T-21
4.	Sieve Analysis	AASHTO T-27
5.	Mortar Strength	ASTM C-109
6.	Soundness	AASHTO T-104
7.	Friable Particles	AASHTO T-112
8.	Lightweight Pieces	AASHTO T-113
9.	Sand Equivalent	AASHTO T-176

206.02.13 Asphalt Materials

206.02.13A General

Unless otherwise specified herein or in applicable subsections, types and grades of material shall conform to the current Oregon State Highway Division's "Specifications for Asphalt Materials" for Light Duty AC obtainable from the Engineer of Materials, ODOT, Salem, Oregon 97310.

206.02.13B Asphaltic Cement

Use performance graded PG 64-22 that meets OSHD requirements for Light Duty AC.

206.02.13C Tack Coat

Asphalt shall consist of CSS-1 or CSS-1h emulsified asphalts.

206.02.13D Slurry Seal

Use CCS-1H cationic emulsified asphalt.

206.02.14 Geotextiles

DESCRIPTION: Geotextiles will be accepted for use in various applications according to the provisions of this section.

DEFINITIONS:

(a) **GEOTEXTILE** - A fabric manufactured specifically for use in civil engineering applications. Fibers used in the manufacture of geotextiles consist of long chain synthetic polymers. At least 85 percent by weight of the long chain polymers are polyolephins, polyesters, or polyamides.

1) **DRAINAGE GEOTEXTILE** - For installation in subsurface drains or other drainage

2) **EMBANKMENT GEOTEXTILE** - For installation within or under embankments for
3) **RIPRAP GEOTEXTILE** - For installation behind and beneath riprap, buttresses, inlays,

4) **WALL GEOTEXTILE** - For construction of retained earth walls.

5) **SUBGRADE GEOTEXTILE** - For installation on subgrades and in other material

6) **PAVEMENT OVERLAY GEOTEXTILE** - For installation beneath an asphalt concrete

(b) **MACHINE DIRECTION** - The long, or warp, direction of the geotextile. The cross-machine, or fill, direction is perpendicular to the machine direction.

(c) **NON-WOVEN GEOTEXTILE** - A textile produced by bonding and/or interlocking of fibers by mechanical, heat, or chemical means.

(d) **ROLL** - Unit of continuous geotextile without transverse seams as furnished by the manufacturer. Roll size may vary between manufacturers and types of geotextiles.

ACCEPTANCE REQUIREMENTS:

(a) **GENERAL REQUIREMENTS** - The geotextile shall:

- Be composed of a polymeric yarn or fiber oriented into a stable network which retains its relative structure during handling, placement, and design service life.

- Meet or exceed the properties outlined under Geotextile Property Values.

- Be free of any chemical treatment or coating which might significantly reduce permeability.

- Have the selvage finished so the outer fibers are prevented from pulling away from the fabric.

- Be free of defects or tears.

- Be resistant to ambient temperatures, acid and alkaline conditions, micro-organisms and insects.

- Be for the intended purpose and have dimensional stability.

(b) Base the actual minimum average roll values furnished by the manufacturer on representative test results from the manufacturing plant which produced the rolls, and shall meet or exceed each of the specified minimum values. Clearly label all rolls as being part of the same production run certified as meeting all applicable requirements.

GEOTEXTILE PROPERTY VALUES

Minimum Value

Geotextile Property Test Method	Drainage (1) Geotextile Type 1/**Type 2**	Riprap (1) Geotextile Type 1/**Type 2**	Subgrade Geotextile	Embankment Geotextile	Wall (1) Geotextile	Pavement (1) Overlay Geotextile
Grab tensile strength minimum in each principal direction - ASTM D-4623	80 lb/**180 lb**	200 lb/**260 lb**	180 lb	230 lb	----	80 lb
Grab Elongation - ASTM D-4632	15%	15%	----	----	----	50%
Burst Strength, Diaphragm method - ASTM D-3786 Mod. (OSHA TM- 814) (TF- 25 Method 3)	130 psi/**290 psi**	320 psi/**430 psi**	290 psi	430 psi	----	----
Puncture Strength - ASTM D-4833 or ASTM D-3787 Mod. (OSHD TM-816)	35 lb/**80 lb**	80 lb/**110 lb**	80 lb	110 lb	----	----
Apparent opening size (AOS), U.S. Std. Sieve - ASTM D-4751 (CW-02215 Corps of Engr.)	No. 70 sieve or smaller opening	No. 70 sieve or smaller opening	No. 30 sieve or smaller opening	No. 30 sieve or smaller opening	(2)	----
Water permea-bility - ASTM D-4491	0.1 cm/sec	0.1 cm/sec	0.005 cm/sec	0.005 cm/sec	(2)	----
Ultraviolet stability - ASTM D-4355 at 500 hours	----	70% strength retained	----	----	70% strength retained	----
Wide strip tensile strength - ASTM D-4595	----	----	----	----	(2)	----
Asphalt retention - OSHD TM 817 (TF-25 Method 3) (3)	----	----	----	----	----	0.20 gal/sq. yd.
Melting point - ASTM D-276	----	----	----	----	----	300° F

206.03 CONSTRUCTION

206.03.01 Description

This work consists of furnishing and placing geotextiles in drains, under embankments, for embankment reinforcement, under riprap, buttresses, inlays, shear keys and erosion control applications, behind retaining structures, over roadbed subgrades, and beneath pavement overlays as shown on the plans and at other locations as directed.

206.03.02 Geotextile Installation Requirements

Acquisition and Storage - Provide complete rolls of geotextile as furnished by the manufacturer and protect against damage and deterioration. Store all geotextile rolls in a dry place and off the ground at all times according to ASTM D-4873. Cover all rolls and partial rolls with a dark protective covering when received. The geotextile will be rejected for use if the Engineer determines it has defects, deterioration, or has been damaged.

Placement:

(1) Surface Preparation - Prepare the surface receiving the geotextile to a smooth condition free of obstructions, depressions and debris unless otherwise directed. Do not drag the geotextile on the ground or mishandle in any way.

Loosely place the geotextile without wrinkles so placement of the overlying material will not tear the geotextile. Lap or sew the geotextile at the ends and sides of adjoining sheets as specified.

(2) On Slopes - Place the geotextile with the machine direction oriented up-down the slope. Lap the upper sheets over the top of the lower sheets. When the geotextile is placed on a slope steeper than 6:1, securely anchor the laps to the ground surface with pins or stakes as necessary to prevent slippage and tearing of the geotextile. Start placement of fill material on the geotextile at the toe of the slope and proceed upwards.

(3) Where Exposed To Water - If geotextiles are placed under water or in areas where water will flow, the geotextile may be placed with the machine direction parallel to the direction of water flow instead of the placement direction specified. Overlap sheets so the upstream sheet is placed over the top of the downstream sheet. Adequately secure the geotextile to prevent slippage. As the geotextile is placed under water, place the backfill material on it to the required thickness. Do not place geotextile more than 50 feet ahead of the specified cover material.

Overlaps - Minimum overlap requirements for geotextiles are:

GEOTEXTILE APPLICATION	MINIMUM OVERLAP REQUIREMENTS, INCHES
Drains	12
Embankment Stabilization	24
Geotextile Wall Reinforcement	24
Pavement Overlays	**
Riprap and Rock Buttresses	24
Roadbed Subgrade Stabilization	24

* Refer to 00350.44
** Use sufficient overlap to insure closure, but not more than 6 inches.

If the Engineer determines the specified overlap is not sufficient, increase the overlap to provide adequate coverage or sew the geotextile together in the field. If field sewn, the provision of 00350.20 and 00350.40(d) apply.

Field Seams:

(1) General - Obtain the Engineer's approval before field seaming and stitching. Sew field seams with polymeric thread consisting of polypropylene, polyester, or kevlar, and as resistant to deterioration as the geotextile being sewn. Use a color of thread that contrasts with the geotextile being sewn so the stitches are exposed for inspection when the geotextile is placed.

(2) Seam Type - Obtain the geotextile manufacturer's recommendation for the type of seam and stitch to be used. If the Contractor does not obtain and provide the foregoing technical information,

use a "J" seam with at least three (3) stitches per inch. The flat, or prayer, seam may be used for repair of damaged in-place geotextile.

Protection of Geotextile - Protect the geotextile at all times from ultraviolet (UV) rays, contamination by surface runoff, and construction activities.

Traffic or construction equipment will not be permitted directly on the geotextile except as authorized.

When placed for construction, cover the geotextile with specified cover material as soon as possible. Do not leave in uncovered condition for more than five (5) days, except when used with temporary retained earth walls and asphalt overlays.

Place cover material on the geotextile in a manner that the geotextile is not torn, punctured, or shifted. Use a minimum six (6) inches thick cover layer or twice the maximum aggregate size, whichever is thicker. End-dumping cover material directly on the geotextile will not be permitted.

Limit construction vehicles in size and weight so rutting in the initial layer above the geotextile is not more than three (3) inches deep or one-half (1/2) the layer thickness, whichever is lesser. Turning of vehicles on the first layer will not be permitted.

Repair of Geotextile - Repair or replace all torn, punctured, or contaminated geotextiles during construction at no cost to the Division. Repair by placing a patch of the specified geotextile over the affected area. Overlap the existing geotextile with the patch. Where geotextile seams are required to be sewn, repair any damaged sheet by sewing unless otherwise indicated on the plans or special provisions or as directed.

206.03.02A Drainage Geotextile

When used in trenches for drains, place the geotextile in the trench as shown on the plans to loosely conform to the shape of the trench with no wrinkles or folds.

206.03.02B Embankment Geotextile

Construct embankment stabilization according to details shown on the plans. Place the geotextile layers so the geotextile machine direction is transverse to the embankment centerline. Spread the geotextile so all slack and wrinkles are eliminated.

206.03.02C Riprap Geotextile

Place geotextile behind and beneath riprap, buttresses, inlays, shear keys, and erosion control applications according to the details shown. Demonstrate to the satisfaction of the Engineer that the combination of the rockfill drop height and the thickness of any aggregate cushion, when specified or required, are adequate to not puncture or damage the geotextile when placing the riprap or stone embankment material. In addition, the following limits apply:

	Maximum Drop Height, Feet	
Size of Rock Material	Onto Geotextile	Onto an Aggregate Cushion Blanket
Greater than 200 lbs.	0	3
200 lbs. or less	3	3

After placing the riprap, backfill all voids in the riprap face so the geotextile is completely covered and not visible.

206.03.02D Wall Geotextile

(a) General - Begin wall construction at the lowest portion of the excavation and place each layer horizontally as shown on the plans. Complete each layer in its entirety before the next layer is started. Seams will be allowed only at the wall face. Either overlap geotextile sheets perpendicular to the

wall or sew seams parallel to the wall face. Stretch the geotextile in a perpendicular direction to the wall face to eliminate slack before backfilling.

(b) Forming the Wall - Use a temporary form system at the wall face during construction. A typical temporary form system and a sequence of wall construction required are shown in the plans. Use pegs, pins, or the manufacturer's recommended method as approved by the Engineer, in combination with the forming system, to hold the geotextile in place until the cover material is placed.

(c) Backfill for Wall Construction - Compact the backfill for the wall within the limits shown or directed. Compact each layer to 95 percent of maximum density as determined by OSHD TM 109. Maintain the water content to within +/- 3 percent of the optimum moisture content. Sheeps foot rollers and vibratory rollers or other rollers with protrusions will not be allowed within 3 feet of the wall face. Compact this area using approved light mechanical tampers, without damaging or distorting the wall facing or reinforcing layers.

206.03.02E Subgrade Geotextile

For roadbed subgrade separation, prepare the subgrade according to Section 501.

Correct geotextile failures, as evidenced by soil pumping or roadbed distortion, by removing any covering material in the affected area and placing a geotextile patch on the exposed geotextile. The patch shall overlap the exposed geotextile a minimum of 12 inches. Cover the patch with the specified cover material and compact before proceeding.

206.03.02F Pavement Overlay Geotextile

(a) General - Place geotextile and pavement overlay in four basic steps:

- Surface preparation
- Sealant application
- Geotextile placement
- Overlay placement

As outlined according to Section 508.

206.04 MEASUREMENT AND PAYMENT (GEOTEXTILE)

Square Unit Basis (Measurements) – Each geotextile installation will be measured along the lines and grades of the installation to the nearest square yard of surface area actually covered according to the plans or as required, except for drainage and wall geotextile applications.

The number of square yards of drainage geotextile will be computed by multiplying the length of the trench where geotextile is used by the perimeter of the trench as determined from the neat lines shown, or as directed.

Geotextile walls will be measured to the nearest square foot of wall face computed by multiplying the length times the sloped height of the wall.

No separate measurement will be made for constructing laps, seams, joints, or patches unless more than the specified lap is ordered, in which case the added lap width will be measured.

Square Unit Basis (Payment) – The accepted quantities for geotextiles will be paid for at the contract price per unit of measurement for the following items:

UNIT OF PAY ITEM MEASUREMENT

a.	Drainage Geotextile	Square Yard
b.	Embankment Geotextile	Square Yard
c.	Riprap Geotextile	Square Yard
d.	Wall Geotextile	Square Yard
e.	Subgrade Geotextile	Square Yard
f.	Pavement Overlay Geotextile	Square Yard

Item (d) includes all backfilling costs and geotextile as shown on the plans.

Item (f) includes preparation work, sealant, and geotextile.

Payment will be payment in full for all equipment, tools, labor, and incidentals necessary to complete the work. No separate payment will be made for constructing laps, seams, joints, and patches unless the Engineer orders additional amounts over the minimum. For laps wider than the minimum or specified width, payment will be made for the added lap width at the contract unit prices.

If the Engineer orders geotextiles with properties more stringent than specified, price adjustment for the difference in material cost only will be allowed.

****

207 LANDSCAPING AND LANDSCAPE RESTORATION

****

207.01 DESCRIPTION

This Section covers the work necessary for: (A) finish grading, addition of topsoil, fertilizer, and weed control, establishment of lawns or grass areas by sod or seeding, and maintenance of lawn or grass areas, complete; (B) mulching, fertilization, and planting of ground cover, establishment of nursery stock, such as trees, shrubs, and small plants, and maintenance of ground cover and nursery stock, complete; (C) irrigation system and subsurface drainage, complete.

207.02 MATERIALS

207.02.01 Plants

Names of plants to conform to standardized names of the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein conform to names generally accepted in the nursery trade. Provide plants which are nursery-grown with habit of growth that is normal for the species, sound, healthy, vigorous, and free from insects, diseases, and injuries and equal to or exceeding measurements specified, measured before pruning with branches in normal position. Provide sizes and methods of handling according to the code of standards recommended by the AAN.

207.02.02 Seed

Provide tested grass and legume seed from blue tag stock and from the latest crop available. Deliver each variety or mixture in standard containers labeled in accordance with Oregon State laws and U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Provide with label showing the following: seed variety, percentage of purity, germination, maximum weed content, and date of test (must be within 9 months of date of delivery). Seed must be tested as set forth in the General Seed Certification Standard by the Oregon State University Certification Board. Mold or evidence of container having been wet or otherwise damaged will be cause for rejection of each lot of seed.

207.02.03 Sod

Provide grass sod from certified or approved source, strongly rooted, and free of pernicious weeds. Sod should be composed of several seed varieties excluding blue and bent grass varieties.

207.02.04 Topsoil

207.02.04A Native Topsoil

Save, store, protect, and reuse approved native topsoil taken from the top 12 inches of the excavation. Ensure that topsoil is free from grass, overburden and roots, sticks, hard clay, and any stones which will not pass a 1-inch square opening. Wherever native topsoil cannot be saved or is not satisfactory for reuse, use imported topsoil conforming to Subsection 205.02.07 IMPORTED TOPSOIL, but only with the approval of the Engineer.

207.02.05 Sand

Conform to the requirements of Subsection 206.02.12C FINE AGGREGATE.

207.02.06 Organic Material for Soil Amendment

Use a peat consisting of natural residue formed by decomposition of reeds, sedges, or mosses from freshwater site. Peat must be free from lumps, roots, stones, and capable of absorbing at least 4 times its dry weight of water. It must contain organic matter not less than 90 percent on a dry weight basis, and have a maximum moisture content at time of delivery of 65 percent by weight.

207.02.07 Lime

Provide a lime composed of ground dolomitic limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes 100 mesh sieve and 90 percent passes 20 mesh sieve. Coarser material may be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing 100 mesh sieve.

207.02.08 Subdrains

Use perforated PVC drain pipe, meeting the requirements of Subsection 601.02.04 PVC PIPE, unless otherwise specified, and as approved by the Engineer.

207.02.09 Irrigation and Water Systems

207.02.09A Pipe

Use copper pipe, Type K hard copper, conforming to ASTM B-88, with commercially pure wrought copper solder joint fittings. Make joints with 95-5 wire solder, ASTM B-32, grade 95 TA. The use of cored solder will not be permitted.

Use PVC pipe (SDR-PR), conforming to ASTM D-2241, and fittings of PVC with deep socket dimensions conforming to ASTM D-2466.

207.02.09B Gate Valves

Install the following gate valves: up to and including 3-inch with bronze bodies, 4-inch and larger with either bronze or iron bodies, all having bronze stems, bronze seat rings, and bronze disc faces, and conforming to ASTM B-62.

207.02.09C Pressure Reducing Valves

Use adjustable, heavy duty bronze pressure reducing valves. Must have approved stainless steel or monel strainer to permit quick cleaning or replacement without dismantling or removing the valve from the line and with integral or independent union.

207.02.09D Control Valves

Provide manual control valves of brass or bronze for underground installation. Valves shall have cross or slot type handle for operation with a standard key, a removable bonnet and stem assembly,

an adjustable packing gland, a rising stem to assure full opening of the valve, renewable disc-type washer seat, and integral or independent union.

Use electrically operated control valves of bronze, brass, or stainless steel. These shall be of the normally closed type, having an open or close time greater than 4 seconds, and capable of manual control during power failure. Provide with a motor assembly or operating parts which are removable without disturbing the valve body. Must be all waterproof for underground burial, and with integral or independent union for supply line connection.

207.02.09E Quick-Coupling Valves

Supply one-piece or two-piece body type, locking cap, having body of approved heavy duty brass or bronze, watertight before and after the coupler is inserted, and designed so that the valve seat is closed before the coupler is removed. Provide valve couplers, keys, and hose swivels of compatible design to quick-coupling valves.

207.02.09F Risers

Connect sprinkler heads and quick-coupling valves to galvanized steel pipe water supply lines with galvanized steel pipe risers. Heads and valves connected to plastic pipe water supply lines shall, in addition, be provided with an approved swing joint.

207.02.09G Vacuum Breakers

Install bronze-bodied machined valve seat, with working pressure rating to 150 PSI. Provide pressure type vacuum breaker as an assembly consisting of vacuum breaker, 2 gate valves, check valve union, and nipples, as approved.

207.02.09H Backflow Preventers

Use either reduced pressure or double check valve assemblies, as indicated in Contract Documents, of a type and size approved by the Owner.

207.02.10 Fertilizer

Use fertilizer conforming to the recommended content as provided for in 207.03.02 SOIL TEST. Furnish fertilizer in moisture-proof bags with weight and the manufacturer's certified analysis of the contents showing the percentage for each ingredient. Furnish fertilizer in a dry condition free from lumps and caking, in a uniform granular or palletized form, of standard commercial grade conforming to all State and Federal regulations and to the standards of the Association of Official Agricultural Chemists. Fertilizer may be furnished in bulk form if an approved transfer hopper is provided.

207.02.11 Mulch and Ground Covers

Use one or more of the following types of mulch:

1. Organic mulch of clean ground Douglas fir or hemlock bark graded so that 50 percent consists of particles larger than ¼ inch, but not exceeding 1-inch, and 20 percent will pass a No. 10 sieve.

2. Stone mulch of screened washed bank gravel with rounded pebbles. Submit sample for approval of color and size.

3. Fiber-glass mulch of approved commercial grade fiber-glass yarn mat.

4. Straw mulch of threshed straw of oats, wheat, or rye, free from seed of noxious weeds or clean salt hay.

5. On steep slopes use approved mesh to reinforce mulch or plantings such as fiber mulch of heavy, twisted jute mesh or other material as approved, with openings between strands approximately 1-inch square.

6. Spray mulch of a verdyol complex, with nontoxic, 100 percent organic water soluble powder binding agent with silva fiber used in hydraulic seeding operations.

207.02.12 Tie Downs

Use one or more of the following materials as the need arises:

1. Eye-bolt masonry anchors of galvanized steel, with approved lead shield or flush shell for setting into masonry joint or concrete.

2. Wood stakes, 2-inch by 2-inch by 96-inch, clear straight cedar, or approved.

3. Wire of 12 gauge, pliable galvanized steel, for guys, or for fastening trees to stakes.

4. Hose for guy wire encasement will be of 2-ply reinforced rubber garden hose, having a minimum 5/8-inch diameter threaded openings fitted with screw eyes.

5. Turnbuckles will be zinc-coated, with a 6 ½-inch lengthwise opening, and _ inch diameter threaded openings fitted with screw eyes.

207.02.13 Soil Sterilant

Soil sterilant shall be as approved by the Engineer for the purpose specified and shall be applied conforming to manufacturer's recommendations.

207.03 CONSTRUCTION

207.03.01 General

Conform to the manufacturer's and supplier's recommendations and instructions and to accepted practices in the industry.

207.03.02 Soil Test

If directed by the Engineer, have a soil test performed before the project schedule is submitted. The test may be performed by any Oregon State University County Extension Agent or by any other approved soils testing laboratory. The soils analysis shall provide a chemical analysis of the soil and recommendations for soil improvement for the vegetation to be grown. The recommendations shall be used to select the particular fertilizer and soil improvement materials to be used prior to planting.

207.03.03 Lawns and Grass

207.03.03A Project Schedule

Within 20 calendar days of the date specified for commencement of work, submit for approval a time schedule indicating dates for beginning and completion of the following operations:

1. Delivery of Materials
2. Preparation of Seedbed
3. Planting Grass
4. Maintenance

207.03.03B Delivery, Handling, and Storage of Sod

Deliver sod immediately on lifting and after lawn bed is prepared for planting. Protect sod from drying by covering during delivery to protect from sun and wind. Store materials only in designated areas.

If sod is not laid within 2 days of delivery, spread out flat with grass side up in cool place and keep moist. Rolled or stacked sod that becomes yellow will not be accepted.

207.03.03C Preparation of Subgrade

After rough grading is completed and before topsoil is spread, apply lime and/or super phosphate as determined by soil analysis, and mix to a depth of 4 to 6 inches. Conform to manufacturer's recommendations for applying lime and super phosphate simultaneously, and schedule application or applications accordingly.

207.03.03D Subsurface Drainage

Lay drainage pipe on firm bed of gravel with minimum fall of 0.5 percent and located as shown on the plans. Place pipe at a minimum depth of 24 inches and not any deeper than required to produce minimum fall. Cover backfill with fiberglass mat to prevent infiltrations of soil. Backfill trenches with gravel to within 4 inches of subgrade.

Place other drain materials in conformance with the applicable requirements in DIVISION 5 - SEWERS. Complete backfilling of trenches with a 4-inch layer of coarse sand and tamp for compaction, as approved.

207.03.03E Topsoil and Finish Grading

Spread topsoil and soil conditioner over the prepared rough grade using a rubber-tired tractor with grader blade or equivalent, weighing a maximum of 3 ½ tons. Imported topsoil must be incorporated with at least a 2-inch layer of subsoil. Thoroughly mix the applied materials to a depth of 8 inches using a disc or cultivator over the entire area in two directions at right angles. Rake topsoil areas to a uniform grade so that all areas drain, as shown on the plans or as approved. Remove all trash and any stones exceeding 2 inches in diameter from the area to a depth of 2 inches prior to preparation and planting grass.

207.03.03F Soil Sterilant

Apply specified soil sterilant at the rate recommended and by the method approved by the manufacturer or as specified.

207.03.03G Seeding

Plant grass seed only at times when local weather and other conditions are favorable to the preparation of the soil and to the germination and growth of grass seed. Sow grassed areas evenly with a mechanical spreader at the recommended rate and method approved by Oregon Department of Agriculture Extension Service. Method of seeding may be varied, as approved, however, the responsibility to establish a smooth, uniformly grassed area will not be waived. Hydroseeding will be permitted, unless otherwise specified.

207.03.03H Sodding

Before sod is laid, correct soft spots and irregularities in grade of the prepared bed, as approved. Lay sod, and tamp or roll so that no voids occur. Water sod thoroughly. Complete sod surface true to finished grade, even and firm. On slopes steeper than 1 to 2, fasten sod with wooden pins 6 inches long driven through the sod into the soil, flush with the top of the sod at approved intervals.

207.03.03I Mulching and Protection of Slopes

Mulch all areas with a slope from 5 percent to 20 percent by spreading a uniform light cover of straw mulch over the seeded area at a rate of 1 1/2 tons per acre.

In areas with a slope steeper than 20 percent, and up to 25 percent, install erosion control netting. In non-turf areas, cover netting with fir bark mulch.

Mulch all areas with a slope steeper than 25 percent with spray mulch applied at a rate of 15 gallons per 1,000 square feet after wetting the ground with water penetrating at least 1 inch deep.

Protect new seeded area from pedestrian traffic. Unless otherwise approved, erect a fence of 2-inch by 2-inch posts 4 feet high spaced 10 feet on center and strung with jute, hemp, or a single strand of No. 12 gauge wire marked with cloth strips at 3-foot intervals between posts.

207.03.03J Maintenance

Begin maintenance immediately after each portion of lawn is planted and continue for 8 weeks after all lawn planting is completed.

Water to keep surface soil moist. Repair washed out areas by filling with topsoil, fertilizing, and seeding. Replace mulch on banks when washed or blown away. Repair fencing as needed. Mow to 2 inches after grass reaches 3 inches in height, and mow frequently enough to keep grass from exceeding 2 1/2 inches. Weed by local spot application of selective herbicide only after first planting season when grass is established.

207.03.03K Lawn Guarantee

If, at the end of the 8-week lawn maintenance period, a satisfactory stand of grass has not been produced, immediately renovate and reseed the unsatisfactory portions of lawn, or when approved, reseed at the beginning of the next planting season. If a satisfactory stand of grass develops by June 1st of the following year, the lawn will be accepted. If the lawn is not accepted, a complete replanting will be required during the ensuing planting season.

A satisfactory stand is defined as a lawn or section of lawn that has:

1. No bare spots larger than 3 square feet.
2. Not more than 10 percent of the total area with bare spots larger than 1 square foot.
3. Not more than 15 percent of the total area with bare spots larger than 6 inches square.

207.03.03L Inspection for Acceptance

Submit a written notice eight weeks after the start of maintenance on the last section of completed lawn. Within 15 days of such written notice the Engineer will make an inspection of the lawn to determine if a satisfactory stand of grass has been produced.

207.03.04 Trees, Shrubs and Ground Cover

207.03.04A Delivery, Preparation and Storage

Dig plants designated as Balled and Burlapped in the Contract Documents with firm, natural balls of earth of diameter and depth sufficient to encompass the fibrous and feeding root system required for full recovery of the plant. Firmly wrap balls with burlap and bind with twine, cord, or wire mesh. Where necessary to prevent breaking or cracking of the ball during the process of planting, or where the tree exceeds 4 inches in diameter, secure the ball to a platform. Meet or exceed AAN Standards, current edition.

Dig bare root plants during dormant period to remove earth with the least possible injury to the fibrous root system. Cover the roots with thick coating of mud immediately after digging by puddling or wrapping in wet straw, moss, or other suitable packing material for protection until delivery.

Furnish container grown plants with self-established root systems sufficient to hold earth together after removal from the container but not root-bound. Plants shall have grown for at least 3 months in the container with inside diameter specified. Meet or exceed AAN Standards, current edition.

If plants are not in the dormant state, spray with anti-desiccant to cover foliage as recommended by manufacturer, prior to digging the plants. During shipment, protect the plants with tarpaulin or other approved covering to prevent excessive drying from the sun and wind.

Cover balls of balled and burlapped plants, and containers of container grown plants, which cannot be planted immediately upon delivery, with moist mulch to protect from drying. Plant or heel-in

bare root plants immediately upon delivery. Water plants as necessary to prevent drying until planted. Do pruning only at the time of planting.

Open and separate all bundles of heeled-in bare root plants before the roots are covered. Avoid leaving air pockets among the roots.

207.03.04B Soil Conditioning

After the specified chemical analysis report for topsoil is received, prepare the topsoil mixture for plant pits and beds by thoroughly mixing the approved topsoil with soil conditioner materials, fertilizer, and lime. Thoroughly mix with rotary mixer or other approved method in the following proportions:

	Required Mixture		Parts by Volume		
Topsoil Classification by Clay Content	Top Soil	Sand	Peat	Fertilizer*	Lime
Clay 5 - 10 Percent	4	0	1 LB/CY	(1/2) LB/CY	(1)
Clay 10 - 15 Percent	2	2	1 LB/CY	(1/2) LB/CY	(1)
Clay 15 - 25 Percent	2	4	1 LB/CY	(1/2) LB/CY	(1)

*Adjust in accordance with Soil Test chemical analysis report.

Store and protect topsoil mixture and other materials at designated area of the site. Protect topsoil mixture from excessive leaching by covering with tarpaulin if stored for more than six (6) weeks.

207.03.04C Planting Procedures

Within twenty (20) calendar days after receiving the notice to proceed, submit a time schedule for approval indicating dates for commencement and completion of the following operations:

1. Tagging of plants in the nurseries
2. Survey and staking of plant locations
3. Delivery of topsoil and other materials
4. Digging and preparation of plant pits and beds
5. Delivery of trees and plants to the site
6. Planting of trees and other plants
7. Fertilization and application of pre-emergent herbicide
8. Guying, staking and mulching
9. Completion of work for start of guarantee period

At least twenty (20) days before start of the guarantee period, submit a schedule of proposed maintenance operations indicating the number of man-hours contemplated for each operation by season during autumn, winter, spring and summer.

Locate new planting where shown on plans, except make approved adjustments where obstructions below ground are encountered or where changes have been made in the construction. Place no planting, except ground cover, closer than 18 inches to pavements and structures. Dig plant pits and have soil mixture for planting ready before plants are delivered. Excavate circular pits with vertical sides a minimum of two feet greater than the diameter of the ball. For trees, shrubs, and vines excavate pits to depth sufficient to accommodate ball or roots when plant is set to finished grade. Place three (3) inches of compacted soil mixture in the bottom of pit. Set plants upright and face as approved to give the best appearance or relationship to adjacent structures. Remove wire, burlap, and surplus binding from top and sides of balls. Spread roots in normal position. Cut all broken or frayed roots off cleanly. Place prepared soil mixture and compact carefully to avoid injury to roots and to fill voids. When

hole is nearly filled, add water as necessary and allow to soak away. Fill hole to finished grade. When directed by Engineer, form shallow saucer around plant by placing ridge of topsoil around edge of pit two feet greater than diameter of ball. After ground settles, fill with additional soil to level of finished grade.

Plant trees before surrounding smaller plants and covers are placed. Position trees as shown on plans or, where spacing dimensions or locations are not clear, as approved.

Plant shrubs on centers as shown on plans with spacing adjusted if required to evenly fill bed using specified quantity of plants.

Plant hedges on centers as shown on plans. Excavate trenches a maximum of 4 inches deeper and 12 inches wider than spread of roots or diameter of balls. Make adjustments to spacing if necessary to fill trench evenly with the quantity of plants shown on plans.

Plant ground covers in beds having minimum 8 inch of prepared soil mixture. Treat ground cover beds with soil fumigant, after preparation for planting, but before any plants are installed within bed area, to destroy weed seeds. Apply according to Manufacturer's directions, delaying planting for the recommended minimum period to allow dissipation of herbicide. Space plants as shown on plans. Mulch and water immediately after planting.

Plant bulbs in ground cover beds to recommended depths for each bulb type as shown on plans.

Provide trees and planting beds with 3 inch layer of fir or hemlock bark mulch within 2 days after planting and keep at this depth throughout maintenance period. Mulch to entirely cover area of saucer around each tree.

Use four guys equally spaced as shown on plans for all trees greater than 4 inches in diameter.

Use three guys equally spaced as shown on plans for all trees 4 inches in diameter or less.

Where shown on plans, wrap trunks of trees spirally from ground line to height of second branches. Make all wrappings neat and snug and hold material in place by raffia cord at top and bottom.

207.03.04D Pruning and Repair

At completion of planting work, prune and repair injuries at all plants. Limit amount of pruning to minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots as a result of planting operations. Do not change natural habit or shape of plant. Make cuts to branch collar, leaving no stubs. On all cuts over ¼ inch in diameter and bruises or scars on bark, trace the injured cambium back to living tissue and remove. Smooth and shape wounds so as not to retain water. Coat with approved tree wound paint.

207.03.04E Plant Guarantee

Guarantee all plants for a minimum of 1 year to be alive and in vigorous growing condition at the end of guarantee period. Guarantee period shall extend 1 year from date of Acceptance of Work as defined in Subsection 101.01 DEFINITIONS. Remove unsatisfactory plants and replace with plants of the same kind, quality and size as originally provided as specified. Guarantee all plant replacements to be alive and in vigorous growing condition 1 year after replacement. Bear all costs of replacement except for replacements resulting from removal, loss or damage due to occupancy of project in any part, vandalism or acts, of neglect on part of others. Replace plants that die immediately, unless during a season unfavorable for planting. When season is unfavorable, plant during the first month of the next favorable planting season.

207.03.04F Maintenance

Begin maintenance immediately after each plant is installed and continue to maintain until the end of the guarantee period.

Perform the following operations: (1) Watering as often as required to maintain capillary water within 2 inches of the soil surface around plants, (2) weeding of plant beds, planting saucers and plant pockets to keep free of weeds, using approved selective herbicide according to the Manufacturer's directions for use, and/or weeding by hand methods, (3) mulching monthly to replenish mulch and keep at required 2 inch minimum depth, (4) tightening and repairing guys to keep trees erect and supported without damage to bark, (5) resetting plants to proper grades or upright position, (6) restoration of planting saucers, (7) seasonal spraying to control disease or insect pests that may impair plant vigor.

Replace plants required by the plant guarantee on a regular monthly basis, except during the months of December, January and February.

207.03.05 Irrigation Systems

207.03.05A General

Install components of the irrigation system as shown and as recommended by the equipment manufacturers. All sprinkler runouts shall be evenly graded to the drain points shown on plans. Piping beneath paved areas shall have a minimum cover of thirty (30) inches. Construct irrigation system in areas to receive topsoil after topsoil is spread, compacted, and rough graded. Copper tubing may be bedded using excavated material. Bed PVC pipe in sand, as shown on plans and backfill to a minimum of 3 inches above the pipe with sand. Determine the final number and location of sprinkler heads after grading is complete, such that complete coverage of all sprinkled areas is provided. Flush out system thoroughly and pressure test before installing sprinkler heads. Adjust flow on each head for proper coverage.

Repair and replace irrigation parts and winterize as necessary.

207.03.05B Copper Tubing

Cut tubing square and remove burrs. Clean both inside of fittings and outside of tubings with steel wool and muriatic acid before sweating. Take care to prevent annealing of fittings and hard-drawn tubing when making connections. Mitering of joints for elbows and notching of straight runs of pipe for tees will not be permitted.

207.03.05C PVC Pipe

Cut, make up, and install PVC pipe in accordance with the manufacturer's recommendations, as approved. Lay PVC pipe using the practice of snaking from one side of the trench to the other, one (1) cycle per forty (40) feet or less. Use strap wrenches for tightening threaded plastic joints. Take care not to over-tighten fittings. Do not lay PVC pipe when the temperature is below 40 degrees F. Sprinklers and valves shall be installed in accordance with the manufacturer's recommendations, as approved.

207.04 MEASUREMENT AND PAYMENT

207.04.01 Incidental Basis

When not specified or shown as a separate pay item in the proposal, payment for all landscape work is considered to be incidental to the construction.

207.04.02 Unit Price Basis

When so listed in the Bid, payment for the landscaping items will be made on a unit price basis for the number of items actually placed and accepted.

207.04.03 Lump Sum Basis

When so listed in the Bid, measurement and payment will be made at the contract lump sum pay item for Landscaping, complete.

****

208 RESTORATION AND CLEANUP

****

208.01 DESCRIPTION

This section covers the work necessary to restore and clean up the site, and remove all construction equipment, refuse, and unused materials of any kind resulting from project activities.

208.02 MATERIALS

Provide all materials required to accomplish the work as specified.

208.03 CONSTRUCTION

208.03.01 Surface Dressing

Slopes, sidewalk areas, planting areas, and roadway shall be smoothed and dressed to the required cross section and grade by means of a grading machine insofar as it is possible to do without damaging the work or existing improvements, trees, and shrubs. Unless specified otherwise, the maximum slope shall be 2 to 1 in cut and fill. Supplement machine dressing by hand work as necessary.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. Grade all areas true to line and grade as shown. Excavated areas adjoining new walkways and curbs shall be backfilled with top soil. Where the existing ground is below the sidewalk and curb, fill and dress the area to the walk. Wherever fill material is required in the planting area, make finish surface high enough to allow for final settlement. Surface improvements other than topsoil which are adjacent to new walkways or curbs, such as asphalt paving or brickwork, shall be replaced with like materials.

208.03.02 Removal of Materials

Remove and dispose of all excavated or construction materials, equipment, and trash of all kinds resulting from the work. Where brush and trees have been disturbed, remove and dispose of or restore same as directed by the Engineer at the Contractor's expense. The Contractor shall provide addresses for disposal sites and obtain Owner approval prior to hauling away such materials.

208.03.03 Cleaning Drains

Clean all drainage facilities such as inlets, catch basins, culverts, and open ditches of all excess material or debris which is the result of the work.

208.03.04 Cleaning Paved Surfaces and Appurtenances

Clean all pavement surfaces, whether new or existing within the limits of the project. All haul routes will be kept free of dust, dirt, gravel, and debris at all times. Clean existing improvements such as curbs, gutters, walls, sidewalks, castings for manholes, monuments, water gates, lamp poles, vaults, signs, and other similar installations.

Flush the street with a pressure type flusher and hand broom or flush all sidewalks.

208.03.05 Restoring Planted Areas

Hand-rake and drag all former grasses and/or planted areas leaving disturbed areas free from rocks, gravel, clay, or any other foreign material and ready, in all respects, for seeding. The finished surface shall conform to the original surface, be free-draining and free from holes, rough spots, or other surface features detrimental to a seeded area.

208.03.06 Restoring Mobilization, Borrow and Disposal Areas

Clean all properties that were disturbed during construction of the project. Dispose of all uprooted stumps, felled trees, brush, excess excavation, rock, discarded materials, rubbish, and debris. Remove all plant, equipment, tools, and supplies and restore the property occupied to a neat, clean, and orderly condition, in equal or better condition to that existing before move in.

208.03.07 Removal of Signs

Do not remove warning, regulatory, guide, or project signs prior to formal acceptance, except as directed.

208.03.08 Restoring Curbs, Sidewalks and Driveways

Repair or replace all curbs, sidewalks, driveways, and other structures damaged during construction of the work. Construct curbs, sidewalks, driveways, and other structures in conformance with the applicable requirements in DIVISION FIVE - STREET TECHNICAL REQUIREMENTS.

208.04 MEASURE AND PAYMENT

208.04.01 Lump Sum Basis

When restoration and cleanup is listed as a separate pay item on the Proposal, it will be paid for on a Lump Sum Basis.

208.04.02 Incidental Basis

When not listed in the Proposal for separate payment, all restoration and cleanup will be considered incidental work for which no separate payment will be made.

****

209 BORING AND JACKING

****

209.01 DESCRIPTION

209.01.01 Boring

Boring shall include all methods by which a pipe or conduit is pushed or pulled into place and by which the excavation method precludes the stationing of a worker within the pipe or conduit without stopping or removing the excavation equipment.

209.01.02 Jacking

Jacking shall include all methods by which a pipe or conduit is pushed or pulled into place and one or more workers inside the conduit excavate and assist in keeping the conduit on a straight and true grade and alignment.

209.01.03 Permits

Permitter shall designate the Owner of railroad tracks or other facilities with prior rights, under which a pipe or conduit must be bored or jacked.

All necessary permits for the undercrossing will be obtained by the Owner.

The operation across the Permitter's right-of-way must conform to the requirements of the Permitter as outlined in a pipeline crossing agreement made between the Permitter and the Owner. The Contractor shall conform with all requirements of the pipeline crossing agreement. Before work is commenced, the Contractor shall be solely responsible for obtaining and delivering to the Permitter a

public liability and property damage insurance policy in the amount required in the pipeline crossing agreement. The insurance company writing the policy shall be authorized to do business in the State of Oregon and shall be satisfactory to the Permitter. The insurance policy or policies shall be delivered to and remain in the possession of the Permitter. If any special agreement is required between the Contractor and the Permitter, it shall be completed and signed before the Contractor enters upon or commences work on the Permitter's property.

209.02 MATERIALS

209.02.01 Pipe Bedding and Pipe Zone Material

Conform to the requirements of Section 205 EXCAVATION, EMBANKMENT, BEDDING AND BACKFILL.

209.02.02 Pipe

Conform to Section 301 PIPE AND FITTINGS (SANITARY SEWERS) or Section 402 WATERWORKS MATERIALS for the strength, class, and type as shown or specified.

209.02.03 Casing

Provide casing of size to permit proper construction to the required lines and grades. Casing shall be the type shown in the table below.

Use minimum gauge or wall thickness corresponding to the size of casing selected from the following; however, be responsible for selecting the gauge consistent with the operations and the specified requirements of the permitter.

Diameter Inches	Smooth Steel Pipe Minimum Thickness
12 & Under	3/16 ASTM A-53
15 – 24	¼ ASTM A-53
30 – 36	5/16 AWWA C-201
48 – 78	Not Allowable

Equip jacked casings with nipples at the springline and crown at 10-foot centers when pressure grouting is specified.

209.02.04 Grout

Grout for filling the annular space between the carrier pipe and casing pipe shall be a mixture of Portland Cement, sand, and pea gravel proportioned to allow complete filling of the annular space. The mixture shall have a creamy consistency which enables it to be pumped with a concrete pump.

Grout for pressure grouting outside jacked carrier or casing pipe shall be a mixture of Portland Cement (Type 1-P) and water proportioned to allow complete filling of all voids. The maximum allowable slump shall be less than 5 inches.

209.02.05 Stainless Steel Bands

One-half inch wide by 0.020-inch thick steel bands, or equal.

209.02.06 Supports and Skids

Lumber shall be No. 2 West Coast Douglas fir graded in conformance with WWPA Current Grading Rules for Western Lumber. Material shall be pressure treated with Creosote or pentachlorophenol in mineral spirits in accordance with AWPA C14, C8, C9, and C2 as applicable. Minimum retention shall be as designated for contact with ground. Method of treatment shall be in accordance with the applicable portion of the AWPA standards. Insofar as practicable, all timbers shall be cut to size before the material is given the preservative treatment.

209.03 CONSTRUCTION

209.03.01 General

Conform to all Federal, State and local laws and regulations pertaining to tunneling and specifically to the standards set forth in the Oregon Safety Code for Places of Employment, Chapter 24, Safety Code for Mining, Tunneling and Quarrying, published by the Oregon Industrial Accident Commission, latest revision.

Before the start of the work, submit satisfactory evidence to the Engineer that all insurance coverage requirements called for by the Permitter have been complied with. If required, proposed construction methods and materials shall be submitted to the Permitter before the start of construction. Written authorization to proceed from the Permitter shall be submitted to the Engineer before the start of construction.

Prior to starting construction, all required labor, materials, and equipment shall be on the site. Notify all Permitters at least 48 hours in advance of working within their right-of-way unless otherwise specified in the permit.

209.03.02 Excavation

Excavation shall be unclassified and shall include whatever materials are encountered to the depths as shown or as required. The boring Contractor or Subcontractor will visit the site and make an estimate of the kind and extent of various materials which may be encountered in the excavation.

209.03.03 Alternate of Jacking or Boring

Jacking or boring may be allowed in lieu of the open trench method. However, written authorization by the Engineer must first be obtained. The Engineer retains the right to reject either the jacking or boring method without rejecting the other. Authorization by the Engineer shall in no way relieve the Contractor of the responsibility for making a satisfactory installation meeting the requirements set forth herein.

209.03.04 Jacking and Boring

Equip the leading section of pipe or conduit with a jacking head securely anchored thereto to prevent any wobble or alignment variation during the jacking or boring operation. For jacking, all excavation shall be carried out entirely within the jacking head, and no excavation in advance thereof shall be permitted. For jacking, every effort shall be made to avoid any loss of earth outside the jacking head. Remove excavated material from the pipe or conduit as excavation progresses, and do not allow such material to accumulate within the pipe or conduit.

Jack or bore all pipes or conduits to true line and grade. Should any deviation from true line and grade be considered excessive, in the judgment of the Engineer, the Contractor shall correct at no expense to the Owner.

Should appreciable loss of ground occur during the jacking or boring operations, backpack all voids promptly. Fill all remaining voids upon completion of the operations; such filling or backpacking shall be with grout.

The design of all sewer pipe or conduit is based upon the superimposed loads and not upon the loads resulting from the jacking or boring operations. The Contractor shall be responsible for any increase in pipe strength necessary to withstand jacking or boring loads and grouting.

209.03.05 Concrete Pipe and Box Section

Protect the driving ends of concrete pipe or conduit against spalling and other damage. Intermediate joints shall be similarly protected by the installation of sufficient bearing shims to properly distribute the bearing stresses. Remove any section of pipe or conduit showing signs of failure and replace with a new section.

209.03.06 Smooth Steel Casing

Join sections of smooth steel casing to be jacked or bored by welding the joints with a continuous weld for full circumference or by other approved means. Provide joints which are capable of resisting the jacking and boring forces without failure.

Brace pipe or conduit installed in a casing to prevent shifting and flotation. Fill the void between the casing and the pipe or conduit with grout, or other material as specified or approved.

If not shown on plans or specified, the casing diameter shall be the option of the Contractor. Provide casing of such strength as to withstand the jacking or boring loads and of such diameter to allow filling the void between the pipe or conduit and casing with the approved material.

209.03.07 Grouting Voids Outside Casing or Carrier Pipe

After the casing, or carrier pipe where no casing is specified, has been jacked or bored into position, pressure grout to fill all voids outside the casing through the grout holes provided. Start grouting at the spring line hole at one end and pump grout until grout appears in the grout hole at the crown, then start grouting through the opposite spring line hole until grout appears at the hole in the crown. Next grout through the hole at the crown until grout appears in the next set of holes along the pipe. Plug the holes at the starting point and move to the next set of holes and repeat grouting sequence until full length of jacked pipe has been grouted. Grouting once commenced at any one point shall be completed without stopping.

Nipples installed in grout holes must be removed and the holes grouted flush with the pipe wall or nipples should be cut off flush with pipe wall and grouted over or use flush mount pipe nipples and plugs.

209.03.08 Cased Pipe

Provide strapped timber cradle under barrel of pipe, join pipe, and slide into casing. Pipe barrel shall bear continuously on cradles. Pipe, installation shall conform to applicable requirements in Section 301 PIPE AND FITTINGS (SANITARY SEWERS) or Section 402 WATERWORKS MATERIALS, including hydrostatic or air testing and line and grade.

209.03.09 Filling Void Between Carrier Pipe and Casing

Completely fill the annular space between the casing and the carrier pipe with dry sand or mix with cement grout (See Subsection 206.02.04B) or as specified. Fill the voids by continuously blowing sand and cement mix or pumping grout from one end of casing pipe until material appears at the other open end. When grouting, use low pressure grouting equipment. The grouting pressures shall not be greater than the design loads of the carrier pipe. The Contractor shall, at his sole expense, remove and replace any pipe sections which fail during the filling process.

209.03.10 Railroad Crossings

The right is reserved by the Owner to require jacking or boring under any or all crossings.

Should open trench construction be required by the Owner at a railroad crossing, the railroad will take up and relay the tracks at no expense to the Contractor. Submit a schedule of operations to the railroad company and to the Owner 72 hours before trenching within 20 feet of the railroad right-of-way. Construct the pipe crossing and compact backfill through the track location within 72 hours after the tracks have been removed by the railroad unless otherwise specified.

209.03.11 Contractor's Responsibility

The Contractor shall be fully responsible for settlement or deterioration of the finished crossing until a period of two years after final acceptance by the Owner.

209.04 MEASUREMENT AND PAYMENT

209.04.01 Boring and Jacking

Measurement and payment for bored and jacked pipe or conduit will be made on a linear foot basis, complete in-place. Payment will include but is not limited to all excavation, shafts, portals, jacking pits, backfill, lubricant, grouting voids outside of casing, filling the annular space between the pipe and the casing, pipe, casing and all appurtenances.

Where casing is not required but is used at the option of the Contractor, the casing and the backfill between the pipe or conduit and the casing shall be included in the pay item for Boring or Jacking as applicable, and no separate payment for pipe will be made.

Measurement for jacking and boring will be made on a linear foot basis along the centerline of the pipe or conduit between the limits shown. Jacking and boring extensions beyond the limits shown shall be considered to be for the Contractor's convenience, unless ordered in writing, and measurement and payment for said extension shall be made as if the open trench method of construction had been used.

Final payment for each crossing will be made after the Contractor furnishes a satisfactory release from the Permitter stating that all claims for labor and materials have been satisfied and that the Contractor's work across the Permitter's right-of-way has been completed to the satisfaction of the Permitter.

209.04.02 Jacking or Boring In Lieu of Open Trench

Where jacking or boring of a conduit is authorized in lieu of open trench construction, measurement and payment will be made as though the open trench method had been used and will include all the pay items that would have been applicable if the open trench construction method had been used.

****

210 RESURFACING

****

210.01 DESCRIPTION

This section covers the work necessary to replace all pavement, pavement base, curbs, sidewalks, rock surfacing and other surface features damaged either directly or indirectly by the operations incidental to the construction of sewers, storm drains, water distribution systems, and conduits.

210.02 MATERIALS

210.02.01 Asphalt Concrete

Use hot mix asphalt concrete Class C mix conforming to the requirements for hot mix asphalt concrete in Section 505 ASPHALT CONCRETE PAVEMENT and Section 206 MATERIALS - TYPES AND USE.

210.02.02 Pavement Base

Use pavement base material for resurfacing trenches which conform to Section 503 AGGREGATE BASES.

210.02.03 Forms

All forms shall conform to requirements in DIVISION 7 - CONCRETE STRUCTURES.

210.02.04 Rock Surfacing

Rock surfacing shall be 1½ inch or 1-inch minus crushed aggregate as specified in Section 205.02.06B.

210.02.05 Subgrade

Subgrade material shall conform to the requirements for subgrade in Section 501 SUBGRADE.

210.02.06 Joint Materials

210.02.06A Preformed Expansion Joint Fillers for Concrete

Preformed expansion joint fillers for concrete shall conform to the requirements of AASHTO M-153 or AASHTO M-213 except those furnished under AASHTO M-213 shall be tested in conformance to ASTM D-1751. Fillers conforming to AASHTO M-213, except the binder, if other than bituminous material, may be used provided they otherwise meet this specification and they have been demonstrated to be rot and vermin proof for a period of at least 5 years. Unless otherwise specified or called for by the plans, the kind furnished may be one or another of the above specified as the Contractor may elect.

210.02.06B Preformed Elastomeric Joint Seals

Preformed elastomeric joint seals shall conform to the requirements of AASHTO M-220.

210.02.06C Poured Filler

Poured filler for concrete joints shall conform to the requirements of AASHTO M-173 (ASTM D-1190).

210.02.06D Rubber Gaskets for Concrete Pipe and Precast Section Joints

Rubber gaskets for use in concrete pipe and precast manhole section joints shall conform to the requirements of AASHTO M-198 except that rubber gaskets for use in concrete siphon pipe joints shall conform to the composition and property requirements set forth in ASTM C-361.

210.02.06E Joint Mortar for Concrete Pipe Joints and Precast Manhole Section Joints

Joint mortar shall consist of one part Portland cement and two parts approved sand with water as necessary to obtain the required consistency. Mortar shall be used within 30 minutes after its preparation unless conditions during use necessitate a shorter time.

210.02.06F Plastic Compound for Precast Manhole Section Joints

Compound for use in precast manhole section joints shall be a putty-like, preformed homogeneous blend of hydrocarbon resins and rubber or plasticizing materials with not more than 50% by weight of inert mineral filler. The compound shall be specifically manufactured for the intended use and shall be pliable at temperatures between 32 degrees F and 135 degrees F. A specimen at 77 degrees F and 1/2" square in cross section shall stretch at least 1 ½ inches before rupture when tested with the apparatus described in ASTM D-113. It shall adhere firmly and cohesively to the precast manhole sections when the compound-sealed joint is flexed to its maximum extent. The compound shall be accompanied by and used with such primer solution as the manufacturer of the compound may recommend. Compound conforming to Federal Specification SS-S-00210 (GSA-FSS) is representative of an acceptable material.

210.02.06G Water Stop

Water stop shall be either plastic or rubber as the Contractor may elect conforming to the following:

(a) Plastic - Polyvinylchloride water stop shall be manufactured to the dimensions called for on the plans from virgin polyvinylchloride (P.V.C.) compound. No reclaimed P.V.C. will be allowed. The water stop shall have the following properties:

	ASTM Test Method	Specification
Tensile, PSI	D-412	1800
Elongation %	D-412	350
100% Modulus, PSI	D-412	760
Low Brittle Temperature	D-746	50 degrees F
Cold Bend Test*		No Failures

*Samples maintained at -70 degrees F for two hours, then bent quickly around a 1/4" mandrel to 180 degrees.

The supplier shall furnish test samples of the material from which his water stop is to be manufactured. Samples shall be in sheet form having a uniform thickness of from 1/16 to 1/8 inch and having a total area of not less than 2 sq. ft. Each sample shall be comprised of pieces not smaller than 6 in. x 6 in.

(b) Rubber - Rubber water stop shall be manufactured to the dimensions shown on the plans in such a manner that the finished product shall have an integral cross section which will be dense, homogeneous, and free from porosity and other imperfections. The water stop shall have the following properties:

Hardness - The shore A Durometer hardness shall be 60 to 70 when tested in accordance with ASTM D 2240.

Elongation - Minimum of 450%.

Tensile strength - Minimum of 3000 pounds per square inch.

Water absorption - Maximum of 55% by weight after immersion in water for two days at 158 degrees F.

Tensile strength after aging - The test specimen, after accelerated aging of 7 days at 158 degrees F, shall retain not less than 80% of the original tensile strength. The tensile strength of the test specimen, after accelerated aging of 48 hours in oxygen at 158 degrees F and tensile stress of 300 pounds per square inch, shall be not less than 80% of the original tensile strength.

Compression set - After 22 hours at 158 degrees F shall be not more than 30% when tested in accordance with ASTM D-395, method B.

Specific gravity - 1.17 +/- 0.03.

Defects - Minor surface defects such as surface peel covering less than one square inch, surface cavities or bumps less than one-quarter inch in longest lateral dimensions and less than one-sixteenth inch deep will be acceptable.

210.03 CONSTRUCTION

210.03.01 Street Maintenance

Maintain all trenches as specified under Section 205 EXCAVATION, EMBANKMENT, BEDDING AND BACKFILL.

210.03.02 Temporary Cold Mix Asphalt

All excavations on hard surfaces shall be paved with a temporary cold mix asphalt patch at the end of each workday.

Place and compact temporary cold mix asphalt to a minimum depth of one inch over the backfilled and compacted trench areas as specified under Section 205 EXCAVATION, EMBANKMENT, BEDDING, AND BACKFILL. Spread with a mechanical spreading machine, or place by hand methods. Distribute into place by means of shovel or suitable forks and spread with rakes in a loose layer of uniform density.

After spreading, the mixture shall be thoroughly and uniformly compacted with a power-driven roller capable of providing compression of 200 to 300 pounds per linear inch as soon as raking is complete. Compact areas inaccessible to the roller by tamping. After compaction, the temporary cold mix asphalt shall have the minimum thickness specified and shall match the adjacent existing grade. The temporary cold mix asphalt patch shall be maintained such that a continuous surface will exist without depressions or potholes.

210.03.03 Pavement Base

Place pavement base to the specified depth; when not specified, place to a compacted depth of 12 inches. Bring the top of the pavement base to a smooth, even grade at a distance below finished grade equivalent to the required pavement depth.

Compact the pavement base with mechanical vibratory or impact tampers to a density of not less than 95 percent of the maximum dry density as determined by ASTM D-1557/AASHTO T-180.

210.03.04 Asphalt Concrete Pavement

210.03.04A Tack Coat

Tack coat all edges of existing pavement, manhole and clean-out frames, inlet boxes and like items. Apply an asphalt tack coat to the base lift of asphalt at a rate of 0.05 to 0.15 gallons per square yard prior to placing the second lift when the time between placing the second lift is greater than four hours after placement of the initial lift.

210.03.04B Asphalt Concrete Placement

Saw cut the existing pavement a minimum of 6 inches from the edge of the existing pavement at the side of the trench. The saw cut shall be a straight line and shall follow lines parallel to the pipe centerline to remove any pavement which has been damaged or which is broken and unsound. The saw-cut pavement edges shall be free of irregularities. Provide a smooth, sound edge for joining the new pavement. Excavate the material immediately below the cutback area and replace with 1"-0" compacted crushed gravel base.

Place the asphalt concrete on the prepared subgrade over the trench to the specified depth, or the depth of the adjacent pavement, whichever is greater. When a prime coat is specified, place asphalt concrete after the prime coat has set. Place the asphalt concrete in a minimum of two lifts. Maximum thickness for any one lift of pavement shall not exceed 2 inches. The minimum thickness for placement of compacted pavement shall not be less than 1 inch. Spread and level the asphalt concrete with hand tools or by use of a mechanical spreader, depending upon the area to be paved. Bring the asphalt concrete to the proper grade and compact by rolling or the use of hand tampers where rolling is impossible or impractical.

Roll with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Begin the rolling from the outside edge of the replacement progressing toward the existing surfacing, lapping the existing surface at least ½ the width of the roller. If existing surfacing bounds both edges of the replacement, begin rolling at the edges of the replacement, lapping the existing surfacing at least ½ the width of the roller, and progress toward the center of the replacement area. Overlap each preceding track by at least ½ the width of the roller and make sufficient passes over the entire area to remove all roller marks and to produce a smooth, uniform surface. Density requirements for asphalt concrete pavement shall conform to those in Section 505 ASPHALT CONCRETE PAVEMENT.

Finished surface of the new compacted paving shall be flush with the existing surface and conform to the grade and crown of the adjacent pavement.

210.03.04C Seal Coat

Immediately after the new paving is completed, apply a seal coat of liquid asphalt conforming to Subsection 206.02.13, ASPHALT MATERIALS, to all joints between the new and original asphalt pavement. The seal coat shall be a minimum of 12 inches in width and shall be centered on the joint. The liquid asphalt shall be applied to the point that it begins to run off. The minimum application rate shall be 1.7 gallons per 100 linear feet.

Immediately after the liquid asphalt has been applied and before the asphalt has solidified, cover the seal coat asphalt with clean-dry masonry sand. The sand shall be applied in a layer thick enough to prevent tracking of seal coat. Before opening the street to traffic, the Contractor shall clean up all loose sand.

210.03.04D Surface Smoothness

The top surface of the asphalt concrete pavement, when tested with a 12-foot straightedge furnished and operated by the Contractor, shall not vary by more than 0.02 foot either parallel to or perpendicular to the centerline. The Engineer will observe this testing and may require additional testing. The means of correction of a surface that does not meet the smoothness requirements shall have the approval of the Engineer.

When tests show the pavement is not within the above tolerances, the Contractor shall take immediate action to correct equipment or procedures in his paving operation to eliminate the unacceptable pavement roughness.

Any surface irregularities exceeding the above tolerances shall be corrected by the Contractor using a method or methods listed herein and approved by the Engineer.

Corrective Action - Corrective measures by the Contractor requiring one or more of the following actions approved by the Engineer shall be performed on deficient areas:

1. Remove and replace the surface course.
2. Place an overlay of a thickness approved by the Engineer.
3. Grind the pavement surface utilizing diamond blades up to maximum depth of 0.3 inch and apply an emulsion fog coat as directed by the Engineer.

All corrective work shall be completed within 10 business days following notification from the Engineer that the pavement does not meet the specified tolerances, unless otherwise directed by the Engineer.

All corrective work, including furnishing of materials, shall be performed at the Contractor's expense and no adjustment in contract time will be made for corrective action work.

210.03.04E Weather Conditions

Asphalt concrete mixtures shall be placed on dry prepared surfaces when the air temperature in the shade and the surface temperature is not less than those specified in the following table:

SURFACE TEMPERATURE LIMITATIONS

Compacted Thickness of Individual Courses	Travel Lanes/ Wearing Course	All Other Courses
Less than 1½ inches	60 degrees F	55 degrees F
1½ inches to 2½ inches	50 degrees F	45 degrees F Over
2½ inches and other	40 degrees F	35 degrees F

Placing of any mixture during rain or other adverse weather conditions normally will not be permitted, except that mix in transit at the time these adverse conditions occur may be laid if the mix is of proper temperature, if the mix has been covered during transit, if placed on a foundation free of pools, or flow of water and if all other requirements of these specifications are met. Asphalt concrete mixtures shall not be placed when the underlying layer is frozen, or when, in the opinion of the Engineer, weather

conditions either existing or expected will prevent the proper handling, finishing, or compaction of the mixtures.

Do not apply asphalt for tack coat when the surface temperature is less than 50 degrees F.

210.03.04F Protection of Structures

Provide whatever protective coverings may be necessary to protect the exposed portions of bridges, culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations.

Where existing structures (e.g., water valve boxes, manholes, catch basins, or other underground utility appurtenances) are within the area to be surfaced, make the resurfacing level with the top of the existing finished elevation of these facilities. The Contractor shall be responsible for adjusting the existing structures as specified in ADJUSTMENT OF EXISTING STRUCTURES TO GRADE (See Section 511 of Street Technical Requirements). Consider any delays experienced from such obstructions as incidental to the paving operation. No additional payment will be made. Protect all covers during asphalt application.

210.03.04G Excess Materials

Dispose of all excess materials. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.

210.03.05 Portland Cement Concrete Pavement

Pavement replaced shall be the same thickness as that removed, or a minimum of 6 inches. Protect the newly placed concrete from traffic for a period of at least 7 days.

Saw cut the existing pavement a minimum of 6 inches from the edge of the existing pavement at the side of the trench. The saw cut shall be a straight line following lines parallel to the pipe centerline and shall remove any pavement which has been damaged or which is broken and unsound. The saw cut pavement edges shall be free of irregularities. Provide a smooth, sound edge for joining the new pavement. Handle, place, finish and cure concrete pavement in conformance with the applicable provisions of Section 506 PORTLAND CEMENT CONCRETE PAVEMENT.

210.03.06 Rock Surfacing

Place rock surfacing only where shown or directed on streets, driveways, parking areas, street shoulders, and other areas disturbed by the construction. Spread the rock by tailgating and supplement by hand labor where necessary. Level and grade the rock surfacing to conform to adjacent existing grades and surfaces as directed.

210.03.07 Concrete Driveways, Sidewalks and Curbs

Replace concrete driveways, sidewalks and curbs to the same section, width, depth, line and grade as that removed or damaged. Saw broken or jagged ends of existing concrete on a straight line and to a vertical plane. Prior to replacing the concrete sections properly backfill and compact the backfill to prevent subsequent settlement.

Replace concrete driveways and sidewalks between scored joints unless otherwise directed by the Engineer. Provide a minimum 2-inch thick compacted leveling course of clean ¾" - 0" minus crushed aggregate. All concrete replacement work shall be completed prior to the placement of adjacent asphalt concrete. Restoration and clean up shall be as specified under Section 208.

Construct forms to match existing. Place concrete and finish exposed surfaces similar to adjacent surface in conformance with Section 507 CURBS, GUTTERS, DRIVEWAYS AND SIDEWALKS.

210.04 MEASUREMENT AND PAYMENT

210.04.01 Temporary Cold Mix Asphalt

Payment for temporary cold mix asphalt pavement placed in all paved areas to be maintained over trench backfill shall be based on the unit price per linear foot stated in the Proposal.

The unit price will include all work and materials required to place and maintain the surface. If not included in the proposal then it will be considered incidental to the work and included in the unit price for pavement replacement.

210.04.02 Rock Surfacing

Payment for replacement of rock surfacing shall be based on the unit price per ton or cubic yard as stated in the Proposal. The quantity of rock replaced shall be the actual number of tons or cubic yards used as directed by the Engineer, and shall be based on weight tickets from state certified weigh stations. The Contractor will supply certified conversion factors to get from ton to cubic yard. Trip tickets shall be presented to the Engineer for his signature on the date of use. No payment will be allowed on trip tickets not so validated by the Engineer. The unit price for the rock shall include payment for excavating to provide space for the rock if necessary and disposal of all excess excavated material.

210.04.03 Asphalt Concrete and Portland Cement Pavement Placement

When the pipe centerline crosses, or is under or at, the edge of existing pavement, payment for asphalt concrete and Portland cement concrete pavement will be based on the unit price per square yard stated in the Proposal for each. The number of square yards will be measured by the Engineer. The pay width for determining square yardage will be as shown on the plans.

The unit prices shall include payment for excavation and dig out required to provide space for the surfacing and compacted crushed rock, preparation of the trench, surfacing, disposal of all excess excavated materials, temporary cold mix asphalt, if not a separate pay item, and all other work required to complete the resurfacing. The crushed rock base and leveling course, crushed rock for the dig out area, and seal coat will also be considered as included in the bid price per square yard for pavement replacement as stated in the Proposal.

210.04.04 Sidewalk and Driveway Replacement

Payment for sidewalk and driveway replacement will be based on the unit price bid per square foot, as stated in the Proposal. No differentiation will be made between concrete and asphalt sidewalks.

The leveling course will be considered as included in the bid price for sidewalk and driveway replacement, as stated in the Proposal.

Payment for replacing damaged sidewalks and driveways lying parallel to the pipe centerline shall be based on the unit price per square foot as stated in the Proposal. Payment will, however, be limited to sidewalks and driveways replaced within three feet of the pipe centerline. All sidewalks and driveways damaged outside these limits shall be replaced at the expense of the Contractor.

The leveling course shall be included in the bid price per square foot as stated in the Proposal.

210.04.05 Curb Replacement

Payment for replacing concrete curbs, curb and gutter, or gutter sections shall be based on the unit price bid per linear foot of for each crossing, as stated in the Proposal.

No differentiation for payment will be made between curb and monolithic curb and gutter sections.

Payments for replacing curbs lying parallel to the pipe centerline shall be based on the unit price per linear foot as stated in the Proposal. Payment will, however, be limited to curbs replaced within three feet of the pipe centerline. All curbs damaged outside these limits shall be replaced at the expense

of the Contractor. No differentiation for payment will be made between curb and monolithic curb and gutter sections.

210.04.06 Removal and Replacement of Culverts, Storm Drains or Catch Basins

Payment for the removal and replacement of existing culverts or storm sewers lying parallel to and within three feet of pipe centerline will be based on the unit price per linear foot, irrespective of size, as stated in the Proposal. Payment shall be considered to include full compensation for all work and materials required to remove and replace the pipe and restore the culvert or storm sewer to at least its original condition and function. Replacement of existing culvert headwalls will also be included in this payment.

Payment for removal and replacement of catch basins will be based on the unit price for each, regardless of size or shape, as stated in the Proposal. Payment shall be considered to include full compensation for all work required to remove and replace the catch basins and restore the basins to their original condition and intended function.

*******END OF DIVISION*******

DIVISION FIVE
STREET TECHNICAL REQUIREMENTS

****

501 SUBGRADE

****

501.01 DESCRIPTION

This section covers work necessary for preparation of the subgrade, complete. See also Section 203 for CLEARING AND GRUBBING, and Section 205 for EXCAVATION, EMBANKMENT, BEDDING, AND BACKFILL.

Subgrade is defined as the area of new or existing roads, streets, alleys, driveways, sidewalks, or locations upon which additional materials are to be placed as a part of work covered in other Sections or by future work. Where applicable, subgrade may be considered to extend over the full width of the specified base course.

501.01.01 Untreated Subgrade

The material placed in fills or unmoved from cuts in the normal grading of the roadbed and which is brought to true line and grade, shaped and compacted as required by these specifications to provide a foundation for the pavement structure.

501.02 MATERIALS

501.02.01 Water

Conform to the requirements in Subsection 206.2.11 Water.

501.03 CONSTRUCTION

501.03.01 PREPARATION

In advance of setting line and grade, complete clearing and grubbing as specified in Section 203 of these specifications. Drain all depressions or ruts which contain water. Blade and shape subgrade to remove irregularities and secure a uniform surface.

Subgrade upon which pavement, sidewalk, curb and gutter, driveways, or other structures are to be directly placed shall not vary more than .10 foot from the specified grade and cross section. Subgrade upon which subbase or base material is to be placed shall not vary more than .10 foot from the specified grade and cross section at any point. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

In advance of setting line and grade, the Contractor shall clear and dispose of brush, weeds, vegetation, grass and debris from the subgrade. The Contractor shall drain all depressions or ruts which contain water.

Prior to starting subgrade work, including backfill, all underground work contemplated in the area of the subgrade shall be completed. This requirement includes work on the contract, work to be performed by the Owner or by others.

The Contractor shall remove all soft or otherwise unsuitable material as directed and replace with approved material from the excavation. The Contractor shall compact to a line one foot beyond the edge of paving, curb or form.

Subgrade areas which cannot be compacted to specified density, but in the judgment of the Engineer otherwise meet the requirements herein, may be removed and aerated or stabilized with an approved soil stabilizing material, all at no additional expense to the Owner.

Subgrade materials which cannot be compacted to specified density because of excess moisture shall be dried out to bring materials to the optimum moisture content. The Contractor shall aerate, drain, rehandle, or by other means at his option remove the excess moisture. Unless otherwise specified in the special conditions, all costs involved in the removal of excess moisture from the subgrade material will be considered incidental and be included in the various other items of work in the Proposal.

501.03.02 Grading of Areas Not to be Paved

When specified, areas within and adjacent to the project which are intended for lawns, planting areas, flower beds and similar uses shall be finished with four (4) inches of topsoil and graded smooth as directed. Topsoil, for such finishing shall be fertile, loamy natural surface soil consisting of sands, silts, clays and organic matter and shall be free of toxic substances, weeds, roots, refuse, sticks, large rocks or lumps. Topsoil available from required excavation shall be used to the greatest extent possible in this work and the provisions of Section RW-02, prohibiting the premature disposal of suitable materials shall apply to topsoil materials.

501.03.03 Overexcavation and Foundation Stabilization

When, in the opinion of the Engineer, unsuitable material or other conditions are discovered which render the subgrade, unable to be compacted to the specified density, then the Engineer may order the Contractor to remove and dispose of the unsuitable material and then backfill with crushed rock as specified in the applicable portions of Section 205 EXCAVATION, EMBANKMENT, BEDDING, AND BACKFILL.

501.03.04 Embankment Construction

The Contractor shall place embankments and fills of all kinds in approximately horizontal layers of a maximum of 8 inches in thickness and compact each layer separately and thoroughly to the density specified.

In the immediate vicinity of curbs, walks, driveways, inlets, manholes and similar structures, in holes and where embankment and fill materials cannot be reached by the normal compacting equipment, the Contractor shall compact to specified density by approved methods.

Where embankments are constructed predominantly of rock fragments, the Contractor shall place material in layers of the thickness as directed, but not greater than three feet. Placing of individual rock fragments having dimensions greater than three feet will be permitted provided that they have no dimensions greater than six feet, that clearances between adjacent fragments provide adequate space for the placing and compacting of material in horizontal layers as specified, and that no part comes within four feet of subgrade. The Contractor shall distribute and manipulate rock so that the interstices between the larger pieces are filled with smaller places, forming a dense and compact mass.

The Contractor shall exercise caution to ensure that embankment construction and fill does not move, endanger or overstress any structure. The Contractor shall place and compact embankments at the end of bridges prior to the time that work begins on the bridge.

Embankments shall not be constructed when the embankment material, or the embankment on which it would be placed is frozen.

501.03.05 Slides and Slipouts

Material outside the planned roadway or ditch slopes which is unstable and constitutes potential slides, in the opinion of the Engineer, material which has come into the roadway, channel or

ditch, and material which has slipped out of new or old embankments shall be excavated and removed. The material shall be excavated to designated lines or sloped either by benching or in such manner as directed by the Engineer. Such material shall be used in the construction of the embankments or disposed of as directed by the Engineer.

The above provisions shall not be so construed as to relieve the Contractor of his obligation to maintain all slopes true and smooth.

501.03.06 Slopes

Excavation and embankment slopes shall be finished in conformance with the lines and grades shown on the plans.

501.03.07 Finishing and Cleanup

All roadbeds, planting areas, ditches, embankments and other areas on which earthwork is performed shall be trimmed reasonably close to established lines, grades, and cross sections and shall be finished in a thoroughly workmanlike manner. They shall be kept free, throughout the work, of debris and foreign matter of all kinds and prior to final acceptance the entire right-of-way shall be cleaned up and finished as directed.

501.03.08 Compaction and Density Requirements

The density of compacted materials in place will be determined by AASHTO T-191, and the maximum density by AASHTO T-99 or T-180 as specified by the Engineer.

The Contractor shall compact all embankments, fills and backfills within three feet of established subgrade elevation to a minimum density in place of 95 percent of maximum density. Below said three-foot limit, compaction shall be a minimum density in place of 90 percent of maximum density.

Roadbed cuts and foundations for structures to a depth of 1 foot below established subgrade or foundation elevation shall be three-inch maximum material and shall be compacted to a minimum density in place of 95 percent of maximum density.

501.04 MEASUREMENT AND PAYMENT

501.04.01 Measurement

501.04.01A Incidental Work

No measurement will be made for work involved in draining water from the subgrade, smoothing the subgrade in preparation for staking, or blading, shaping, and compacting the subgrade including roadbed materials to a depth of 12 inches below the subgrade, to final line, grade, and cross section. All work involved in these processes will be considered incidental to and included in the various other items of work in the Proposal.

Water used in the work (compaction, dust control, etc.) will be considered incidental to and included in the various other items of work in the Proposal.

501.04.01B Untreated Subgrade

No measurement and payment will be made for preparation of untreated subgrade unless otherwise provided.

501.04.01C Overexcavation and Foundation Stabilization

Measurement for overexcavation will be made on cubic-yard basis for quantities removed, and foundation stabilization will be made on a ton basis for the number of tons of crushed rock used to backfill the overexcavated areas, as weighed on approved and tested scales. Trip tickets shall be given to Engineer as specified in Subsection 503.04.01C.

501.04.01D Embankment Measure

"Embankment in Place" will be measured by the cubic yard in embankment as set forth in the two paragraphs which follow.

The pay quantities of "Embankment in Place" will be determined by cross-section measurement of the material in place in final embankment position in the work as specified and in accordance with the directions of the Engineer. The pay quantities of "Embankment in Place" will be limited to the neat lines of specified cross-sections, lines, grades, and slopes and above the ground or base elevations existing at the time embankment construction thereon begins. The pay quantities will not include additional quantities required due to subsidence and settlement of the ground or foundation, to settlement of materials within the embankments, or to shrinkage, settlement, washout, slippage, or loss regardless of cause.

There will be no measurement of overhaul on "Embankment in Place" materials.

501.04.02 Payment

501.04.02A Overexcavation and Foundation Stabilization

Payment for overexcavation will be made on a cubic-yard basis, and foundation stabilization will be made on a ton basis for crushed rock incorporated in the work.

501.04.02B Embankment in Place

Payment for "Embankment in Place" will comprise full compensation for the excavating, selecting, handling, hauling, placing, and compacting of the materials and all other costs incurred in the construction of the embankments involved.

****

502 WATERING

****

502.01 DESCRIPTION

This section covers work necessary to furnish and apply water for roadway excavations, fills, subgrades, roadbeds, backfill, subbases, bases, and surfacings, and water used for the alleviation or prevention of dust within the project limits.

502.02 MATERIALS

502.02.01 WATER

Water shall be free of silts and other deleterious matter. Make all necessary arrangements and pay all costs for obtaining water. Maintain an adequate supply of water at all times to complete the required work.

502.03 CONSTRUCTION

The Contractor shall make all arrangements necessary for the procurement of water and its application. The Contractor shall obtain a hydrant meter from the Engineer for the purposes of measuring all water used on the project.

Water by means of tank trucks equipped with spray bars, by hose and nozzle, or by other approved equal means which ensure uniform and controlled application. The use of splash boards will not be permitted without prior approval.

Perform watering at any hour of the day and on any day of the week as necessary.

502.04 PAYMENT

502.04.01 WATER ON INCIDENTAL BASIS

When neither specified nor shown in the Proposal for separate payment, all water will be considered incidental to the other items of work and no separate payment will be made.

****

503 AGGREGATE BASES

****

503.01 DESCRIPTION

This section covers work necessary to furnish and place one or more courses of aggregates and water, as base, on a prepared surface.

503.02 MATERIALS

Aggregates for aggregate base shall be crushed gravel or crushed rock. Aggregate for subbase shall be crushed gravel or crushed rock including sand.

503.02.01 Aggregate

Coarse and fine aggregates shall conform to requirements of Section 206 MATERIALS - TYPES AND USE and to additional requirements contained herein.

503.02.02 Sand Equivalent

Base aggregates to be incorporated in the work shall have a sand equivalent of not less than 30 when tested in conformance with AASHTO T-176.

503.02.03 Liquid Limit and Plasticity

Base aggregate shall meet the requirements for Liquid Limit and Plasticity Index of Subsection 206.02.12C FINE AGGREGATE.

503.02.04 Grading Requirements

The base aggregates shall be uniformly graded from coarse to fine and shall conform to one or another of the following grading requirements as specified:

Sieve Size	Separated Sizes 22" B 0	2" B 0	12" B 0	1" B 0	¾" B 0
	Percentages (by weight)				
3"	100				
2 1/2"	95 - 100	100			
2"		95 - 100	100		
1 1/2"			95 - 100	100	
1 1/4"	55 - 75				
1"		55 - 75		90 - 100	100
3/4"			55 - 75		90 - 100
1/2"				55 - 75	
3/8"					55 - 75
*1/4"	30 - 45	30 - 45	35 - 50	40 - 55	40 - 60

*Of the fraction passing the ¼" inch sieve, 40 percent to 60 percent shall pass the No. 10 sieve.

For determination of sizes and grading conform to AASHTO T-27. Where 1"-0 base aggregate is approved for use, at least 70 percent (by weight) of the material passing the ¼" sieve but retained on the No. 10 sieve shall have at least one mechanically fractured face.

503.02.05 Acceptance

Materials will be subject to acceptance as follows:

Construction Method	Time of Acceptance
Stationary plant mixed	Immediately following mixing
Travel plant mixed	After mixing and before laying
Road mixed	After mixing and before compacting

Acceptance will be based on periodic samples taken following mixing, or gradation test reports supplied by the Contractor.

503.03 CONSTRUCTION

503.03.01 Preparation of Subgrade

Ensure that all surfaces and materials on which subbase or base is to be constructed are firm and have been prepared as specified in the applicable portions of Section 501 SUBGRADE.

503.03.02 Mixing

Mix to provide a homogeneous mixture of unsegregated and uniformly dispersed materials which will compact to not less than 95 percent maximum density as specified in Subsection 503.03.04. Add water during mixing in amount sufficient to provide optimum moisture content plus or minus two percentage points.

503.03.03 Placing

503.03.03A Weather Limitations

When the weather is such that satisfactory results cannot be secured, the Contractor shall suspend operations. Place no surfacing materials in snow or on a soft, muddy, or frozen subgrade. Owner will not be liable to damages or claims of any kind or description by reason of operations being suspended due to weather limitation.

503.03.03B Equipment

Furnish equipment that will provide for efficient and continuous operations insofar as practicable.

Aggregate bases shall be deposited on the roadbed at a uniform quantity per linear foot so that the Contractor will not resort to spotting, picking up, or otherwise shifting of aggregate base material. Segregation of aggregates shall be avoided and the material as spread shall be free of pockets of coarse or fine material.

Spreading equipment shall have an adjustable screed or strike-off assembly and it may have a receiving, mixing, and distribution system. It may be a complete and integral unit, self-propelled and powered; a crawler-track or wheeled type tractor intimately combined with a receiving, mixing, spreading, and screeding unit attached thereto; or a heavy-duty self-propelled grader, of an approved type, equipped with at least an eight-foot blade. Equipment shall be capable of spreading or striking off material to the designed line, grade, and transverse slope with surface texture of uniform appearance without excessive segregation or fracture of material.

Spreading equipment may be provided with an automatic control system if Contractor so elects or if specified.

503.03.03C Thickness of Lifts

If the required compacted depth of the base course exceeds six inches, construct in two or more layers of approximately equal thickness. Maximum compacted thickness of any one layer shall not exceed six inches. Place each layer in spreads as wide as practicable and to full width of the course before a succeeding layer is placed.

503.03.04 Compaction

At the time compaction begins, the materials shall be at optimum moisture content, plus or minus 2%. Compaction of each layer shall continue until a density of 95% of Relative Maximum Density has been obtained according to OSHD TM 106 and OSHD TM 306C. Water shall be added to the materials, as necessary during the compaction, to maintain the proper moisture content and upon completion of each layer, the Contractor shall maintain the materials in specified conditions until it is covered by the following layer or course.

503.03.05 Surface Finish

Surface of the base shall parallel the established cross section and grade for the finished surface within 0.04 foot. The finished surface of base, when tested with a 12-foot straight edge shall not vary from the testing edge by more than 0.04 foot at any point.

503.04 MEASUREMENT AND PAYMENT

503.04.01 Measurement

503.04.01A Square Yard Basis

Measurement of aggregate base made on a square yard basis will be made of width and length of each separately constructed strip of aggregate base incorporated in the work and accepted, wherein width is the design width or edge-to-edge width of aggregate base, whichever is the lesser, and length is from end to end along the center of the strip. Measurement shall be on the surface of the aggregate base to the nearest 0.1 foot and the square yardage shall be to the nearest full square yard.

Extra thickness of aggregate base, when directed by the Engineer, will be measured by conversion on a proportionate volume basis to an equivalent number of square yards of specified standard thickness of base.

503.04.01B Cubic Yard In Place Basis

Measurement of aggregate base made on a cubic yard in place basis will be made taking depth tests or cores at the rate of 1 depth test for each 300 square yards of base course, or by means of average end areas on the complete work computed from elevations to the nearest 0.01 foot. On individual depth measurements, thicknesses more than ½ inch in excess of that shown shall be considered as specified thickness.

503.04.01C Ton Basis

Measurement made on a ton basis will be for the number of tons of aggregate base, as weighed on approved and tested scales. Give trip tickets to the Engineer for his signature as the material is delivered. Each trip ticket shall show the date and time of delivery, truck number, driver's name, net weight of material, and will be considered as valid delivery receipts only when signed by the Engineer. Deductions in weight will be made at the point of weighing for moisture in excess of the optimum moisture content determined for the material being supplied.

503.04.02 Payment

Payment will be made on square yard, cubic yard, or ton basis as shown on the Proposal.

****

504 CEMENT TREATED BASE

****

504.01 DESCRIPTION

This section covers the work necessary for the furnishing and construction of the cement treated base complete.

504.02 MATERIALS

Composition of Mixture

The cement treated base (CTB) mixture shall be comprised of aggregate, Portland cement, and water in the proportions and amounts established by the mix design. The cement content normally is to be between 4.5 and 5.5 percent of the dry weight of the aggregate. The mixture shall be proportioned to provide for a minimum 28-day ultimate compressive strength of 1,000 psi. The proportions of the materials will be subject to change as required to meet the herein specifications.

In all plants, the weight or rates of feed of aggregates and water shall be within five percent of the amounts of each material that are specified. The weights or rates of feed of cement shall be such that the variations in cement content in samples, taken from any part of a mixed batch or from different batches, or from time to time from the product of continuous mixers, or from mixtures spread on the roadbed, shall not have variations above or below the cement content designated by the Engineer of more than 0.5 of a percentage point.

504.02.01 Aggregate

The aggregate shall meet the requirements of Section 503 AGGREGATE BASES and shall be crushed rock or gravel including sand conforming to specifications.

504.02.02 Portland Cement

Cement to be used shall be Portland cement Type I or Type II conforming to the requirements of AASHTO M-85 for low alkali cement. The total alkali content shall not exceed 0.8 percent and the tricalcium aluminate content shall not exceed 10 percent.

504.02.03 Water

Water used in mixing shall be clean and free of oil, salt, acid, alkali, sugar, vegetable matter, or other substance injurious to the finished product, and shall meet the requirements of AASHTO T-26.

504.02.04 Asphalt Materials

The asphalt used for the curing seal shall be emulsified asphalt meeting the requirements of Subsection 206.02.13, Asphalt Materials.

504.02.05 Mix Design and Certification

Ten days prior to production, the Contractor shall furnish the Engineer a complete mix design showing the proportions of all constituents proposed for use and strength test results of samples prepared using the proposed proportions and constituents for a minimum of 7 day, 14 day, and 28 day curing periods. Also, accompanying the mix design, the Contractor shall submit the manufacturer's certification and a copy of test results with respect to the product involved. The certification shall consist of the name of the project, the name and address of the manufacturer and the testing agency and the date of testing. The certification shall also set forth a means of identification which will permit field determination of the product delivered to the project as being the product covered by the certification.

The Contractor shall be responsible for all costs of certification and testing of products in connection therewith.

504.03 CONSTRUCTION

Preparation of Underlying Course

Prior to the production or placing of cement treated base, complete all utility work and prepare the subgrade in strict accordance with Section 501 SUBGRADE.

504.03.01 Mixture

The CTB mixture shall be mixed at a centrally located plant of the batch type or of the continuous mixing type, capable of providing a mix of aggregate, cement, and water of uniform proportions and consistency as designated by the mix design.

The charging of the materials into the mixer shall be by means whereby the quantities of the several materials are accurately controlled. Mixing shall continue until a uniform and homogeneous mixture of aggregate, cement, and water has been obtained. In general, the time of mixing shall not be less than 30 seconds, except that the time may be reduced when tests indicate that the requirement for the variation of cement content, as specified, can be consistently complied with.

504.03.02 Weather Limitations

The CTB shall be constructed in accordance with the weather limitations as set forth in Section 701 CONCRETE STRUCTURES.

504.03.03 Equipment

Equipment used shall conform to the following requirements unless otherwise approved:

504.03.03A Hauling Equipment

Vehicles for hauling the mixture shall be watertight, agitating, or nonagitating, and capable of discharging the mix without waste and with practicable minimum amount of separation.

504.03.03B Spreading Equipment

Spreading of the CTB mixture shall be by a machine which has an adjustable screed or strike-off assembly and it may have a receiving and distribution system. The equipment shall be capable

of spreading the material and striking it off to the required thickness and the designated line, grade, and transverse slope without segregation, dragging, or fracture of material. The spreading and screeding equipment may be a complete and integral unit, self-propelled and powered; a crawler-track or wheeled type tractor intimately combined with a receiving, spreading, and screeding unit attached thereto; or, if approved by the Engineer a heavy duty self-propelled grader, equipped with at least an eight-foot blade. The screed or strike-off assembly shall operate by an approved action which produces specified results and a surface texture of uniform appearance.

Spreading equipment which rides on freshly spread material and produces tracks or partially compacted areas thereon will be acceptable provided no displacement of material or filling of tracks occur, and provided further that the tracks are not of such depth as to be visible after compaction is completed.

The spreading equipment may be provided with a control system automatically controlling the laying of the mix to specified transverse slope and longitudinal grade by means of actuation from an independent line and grade control reference, if the Contractor so elects.

504.03.03C Other Equipment

Equipment shall be provided to apply water by spray method to the CTB mixture during its compaction, the spray attachments being of a type that will produce a uniform and controlled fine spray. Equipment for application of the bituminous curing seal shall provide application by pressure spray method in a uniform and controlled application. Motor graders shall be available for correction of unavoidable segregation at edges of the mix.

504.03.03D Compacting Equipment

Compaction shall be with vibrating type, pneumatic tire type, steel wheel type, or other approved type compactor, as the Contractor may elect; provided however, that compactors with lugs, projections, or other features that would leave ruts, holes, grooves, or uneven surfaces in the CTB after compaction or which would loosen the mixture while operating will not be permitted. Either a pneumatic tire roller or a smooth steel wheel roller shall be provided for the final rolling and compacting of the mixture.

504.03.04 Hauling and Placing

Maintain the surface of the underlying course in a wet condition by sprinkling just in advance of placing. The CTB mixture shall be delivered an deposited without delay. Mixture which has begun to harden and take an initial set prior to placement, or which has been retempered in transit with water, will be rejected and shall be wasted at the sole expense of the Contractor.

The mixture shall be delivered to the spreading machine by direct deposit in the receiving hopper, by placing in windrows in front of the machine, or by other means acceptable to the Engineer. If material is placed in windrows it shall be deposited on the roadbed at a uniform quantity per lineal foot, which quantity shall be sufficient to provide the required compacted thickness without resorting to excess spotting, picking-up, or otherwise shifting or the mixture. The mixture shall be delivered and placed without hauling equipment operating over any uncured material.

The mixture shall be spread and screeded by specified equipment in one or more layers to provide the compacted thickness called for by the Drawings. Placing shall be in strip widths which will hold the number of longitudinal joints to a practicable minimum, normally to not less than 10-foot widths.

The depositing and spreading shall progress continuously without breaks insofar as is practicable. Should stoppage of operations be of such duration as to allow the mixture to take its initial set, the Contractor shall construct a transverse construction joint as hereinafter provided.

The mixture shall be spread and screeded to required thickness and to designated line, grade, and transverse slope without segregation, dragging, or fracture of the components of the mixture.

Motor graders shall be used to correct unavoidable segregation at edges and to reprocess minor areas of deficiency.

504.03.05 Thickness and Number of Layers

If the required compacted depth of CTB exceeds six inches (6"), it shall be constructed in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed six inches (6").

504.03.06 Construction Joints

When it is necessary, due to the termination of the day's run or to shutdown, to discontinue placing the mixture for a period of time which will allow the placed mixture to take its initial set, the Contractor shall construct a temporary transverse construction joint. This joint shall be formed with a wooden block, such as a six-inch thick timber with width equal to or greater that the depth of the course, or with other devices acceptable to the Engineer, extending across the width of the strip and held firmly against the vertical end of the strip of mixture which is to terminate at the joint. The top of the joint form shall be set true to the slope and grade of the CTB and shall be firm under pressure from compacting equipment. When construction of the CTB is resumed, the form shall be removed without damage to the adjacent CTB.

504.03.07 Compaction

Compaction of the CTB mixture with specified compactors shall begin as soon as it has been spread and shall be continuous until completion. Not more than sixty (60) minutes shall elapse between the start of the mixing and the time of starting compaction of the CTB mixture on the prepared subgrade. Compaction shall begin at edges and shall be controlled to prevent breakdown at the sides of a strip.

Successive passes of the compactor shall be so spaced that no more than 75% of the compactive width of the compactor shall be on an uncompacted area at any time.

During compacting, sprinkling with water by fine spray application shall be done at the time and in the amounts required. Surfaces of uncompacted, partially compacted mixture shall be kept moist at all times until the bituminous seal has been placed thereon.

Compaction on the completed CTB shall be 95 percent of the maximum density indicated by the mix design.

504.03.08 Surface Finish

The CTB surface shall parallel the cross section and grade of the finished surface within 0.04 foot, and when tested with a 10-foot straight edge shall not vary from the testing edge by more than 0.03 foot at any point.

When Portland cement concrete pavement is to be placed on the CTB, the surface of the CTB at any point shall not extend above the grade established by the Engineer. The specified finish shall be attained by the following method.

After compaction of the final lift, the surface of the CTB shall be brought within the specified tolerances by trimming with a subgrade planner, by motor grader equipped with an electronically controlled blade or by grinding. Areas on which trimming or grinding is performed shall be rolled until a smooth surface is attained.

The excess material may be used at other locations in the work area provided said excess material complies with applicable specification requirements.

504.03.09 Bituminous Curing Seal

As soon as possible after each layer of the CTB is constructed; as herein- before specified, and while it is still moist, the surface and exposed edges shall be covered with a bituminous curing seal. The

liquefied asphalt shall be applied at a uniform rate between .25 gallon and .35 gallon per square yard by a pressure spray method.

After the curing seal has been applied, it shall cure for a period of 4 days and during this period no vehicle shall be permitted to use the section. In case of damage to the curing seal, after application and during the curing period, the damaged section shall be repaired by the Contractor immediately by resealing at his own expense.

The curing seal on any lift of CTB may be omitted if, within two hours after the start of mixing of the preceding lift of CTB, a succeeding lift of material (CTB, bituminous base or asphalt concrete) is placed over the preceding lift. Vibratory rollers will not be permitted in the compaction of any succeeding lift of CTB, bituminous base, or asphalt concrete during the period of time from two hours to 96 hours after the mixing of any of the underlying lifts of CTB.

504.03.10 Care of Work

During the construction of the CTB, the Contractor shall exercise care to protect the work from damage. Following construction of each strip and each layer of the base and following construction of the entire course of the CTB, the Contractor shall perform such work as specified and as the Engineer may determine to be necessary to prevent raveling and rutting, to prevent segregation of materials, and to maintain the layer or course of the CTB to the specified compaction and surface finish; all until the strip, layer, or course is covered by a following layer or course of material as specified or until all work under the contract is completed.

504.03.11 Modification of Equipment and Methods

On tapers and other areas of irregular shape, limited length, restrictive width or other condition where the Engineer determines that full compliance with the above equipment and construction requirements is not practicable, the specified equipment and construction requirements may be modified, subject to approval by the Engineer.

504.03.12 Timing of Operations, Adequacy of Organization, and Rejection of Mixture

All operations involved in constructing the CTB shall be so timed and coordinated that regardless of daily or seasonal variations in weather, temperature and humidity, such work shall result in a finished CTB conforming in all respects to specified requirements.

In this respect, the Contractor shall provide and have readily available at all times adequate equipment, tools, material, and labor; and shall achieve the hauling, spreading, compacting, and trimming of the CTB mixture within two hours after mixing.

Any CTB mixture not placed and trimmed within this two-hour period shall be subject to rejection, wasting, removal, and replacement as the Engineer determines to be applicable, and all costs involved in such removal, wasting, and replacement shall be borne by the Contractor.

504.03.13 Handling Traffic Over Cement-Treated Base

At locations where traffic must be routed over the cement-treated base, the CTB mixture shall be made with Type III or Type IIIA (high early strength) cement to expedite development of strength at an early date. Any extra costs of using high early strength cement shall be considered as incidental, with payment therefore covered in the pay item "Portland Cement in CTB Mixture."

If the Engineer so directs, traffic over recently constructed CTB shall be controlled as to speed and routing.

504.03.14 Testing

Materials and Mixture

Aggregate and cement will be subject to acceptance as specified under MATERIALS. Plant mixed mixtures will be subject to final acceptance after blending and mixing either at the plant or place of delivery. Acceptance will be based on periodic sample taking.

When specified the Contractor shall furnish certified laboratory tests that show results of the tests at no expense to the Owner. The Engineer may do sampling and/or testing of the materials. If evidence of non-compliance with the requirements exist, additional tests may be required to assure that the materials meet the requirements as specified at the sole expense of the Contractor.

504.03.14A In-Place Sample

The Engineer shall be permitted to cut samples or to take cores, or to require the Contractor to cut samples or take cores, from the full depth of the compacted mixture or from the separate layers and courses thereof for testing purposes, and at such locations and at such frequencies as the Engineer determines necessary for proper representation. Sampling shall be at the expense of the Contractor. Where samples have been taken and the samples show deficiencies according to these specifications, the Contractor shall repair the cuts or cores with like material and shall make repairs to the pavement as directed by the Engineer, all at no expense to the Owner.

504.04 MEASUREMENT

504.04.01 Cement Treated Base

Quantities for CTB will be measured on a square yard basis. The measurement will be based upon the surface length and width, up to the specified length and width, of the CTB measured to the nearest 0.1 foot and the area measured to the nearest square yard.

504.04.02 Bituminous Curing Seal

The asphalt emulsion used for the bituminous curing seal shall be measured on a square yard basis, and shall include only that asphalt emulsion actually incorporated in the seal.

504.04.03 Payment

Payment for the cement treated base and asphalt curing seal shall be based on the price stated in the Contractor's Proposal and shall be understood to comprise full and complete compensation for all labor, equipment, tools, materials, and incidentals necessary for all of the contract work as specified under or covered by this Section.

When neither specified nor listed in the Proposal for separate payment, any and all work specified for performance under or covered by this Section will be considered as incidental work for which no separate payment will be made.

****

505 ASPHALT CONCRETE PAVEMENT

****

505.01 DESCRIPTION

This section covers work necessary for the construction of hot mix asphalt pavements under prepared foundations or base surfaces.

Hot mix asphalt concrete is defined as a mixture of asphalt cement; well graded, high quality aggregate; mineral filler and additives as required; heated and plant mixed into a uniformly coated mass, hot laid on a prepared foundation and compacted to specified density.

505.02 MATERIALS

505.02.01 General

Asphalt and aggregate shall meet OSHD requirements for Light Duty AC and will be subject to approval preceding mixing. Plant mixed mixtures will be subject to final approval after blending and mixing, either at the plant or at the place of delivery prior to rolling. Approval will be based on periodic sampling and testing of the materials. Tests results shall be furnished to the City Inspector prior to any paving application.

505.02.02 Asphalt Cement

Asphalt materials incorporated in the mix shall be performance graded PG 64-22 that conforms to requirements of Section 206 MATERIALS - TYPES AND USE.

505.02.03 Aggregates

Aggregates shall conform to requirements of Section 206 MATERIALS - TYPES AND USE.

505.02.04 Mineral Filler

Mineral filler shall conform to the requirements of AASHTO M-17.

Collector dust may be used as mineral filler, in whole or in part, provided the dust or the resultant mineral filler mixture conforms to the above requirements.

505.02.05 Additives

Additives and admixtures may be used to prevent stripping or separation of bituminous coatings from aggregates, and to aid in the mixing or use of bituminous mixes or for experimental purposes. The Contractor shall inform the Owner if additives are used for experimental purposes. Use admixtures and additives of standard recognized products of known value for the intended purpose and obtain approval on the basis of laboratory tests prior to their use. They shall have no deleterious effect on the bituminous material and shall be complete miscible.

505.02.06 Composition and Proportion of Mixtures

The class of asphalt concrete to be used shall be as shown and shall conform to the following requirements:

DENSE GRADED

Percentage of Total Aggregate (by weight)

Sieve Size Passing	Class "B"	Class "C" (Mod.)	Class "D"
1"	99 - 100	----	----
3/4"	92 - 100	99 - 100	----
1/2"	75 - 94	91 - 100	99 - 100
1/4"	50 - 70	58 - 73	85 - 100
#10	21 - 41	24 - 36	37 - 57
#40	6 - 24	8 - 18	13 - 29
#200	2 - 7	3 - 8	4 - 9
Asphalt Cement**	4 - 8	3 - 8	4 - 8

* Including Lime or Cement Filler.

**Percent of total mix (by weight).

The amount of new asphalt cement to be added to the recycled mixture will vary from 3-8%.

Class "B", "C", and "D" asphalt concrete shall meet the following qualifying test requirements:

Test	Test Method	Requirements
Stability, First Compaction	OSHD Standard Test*	35 min. (residential streets) 40 min. (arterial streets)
Voids, First Compaction	OSHD Standard Test*	7% maximum
Voids, Second Compaction	OSHD Standard Test*	1% minimum
Retained Strength	AASHTO T-165-Modified	70% minimum

*Available from Engineer or Materials, ODOT, Salem, Oregon 97310.

505.02.07 Mix Formulas

The Contractor may be required to submit a job-mix formula for review by the Engineer. The job-mix formula shall indicate the gradation of each of the several aggregate constituents to be used in the mixture and shall establish the exact proportion of each constituent to be used to produce a combined gradation of aggregate within the appropriate limits stated above.

The job-mix formula shall also indicate the ASTM bulk specific gravity of each aggregate constituent, the measured maximum specific gravity of the mix at the optimum asphalt content determined in accordance with ASTM D-2041, all properties as stated in Subsection 505.02.06 of these specifications for at least four different asphalt contents other than optimum, two of which will be below optimum and two of which will be above optimum, the percent of asphalt lost due to absorption by the aggregate, and any other information pertinent to the design of the mix.

505.02.08 Recycled Asphalt Pavement (RAP) Materials Permitted

The Contractor shall have the option of using processed recycled asphalt pavement materials in the production of new asphalt concrete pavement. The RAP materials proposed for use in the recycled mix shall contain hard, sound, and durable aggregates, and asphalt of a composition to provide properties equivalent to asphalt as specified in these specifications when in the mix. Recycled material which is used in the asphalt concrete pavement shall have a maximum size of one-inch prior to entering the cold feed. If there is evidence of the recycled material not breaking down during the heating and mixing of the asphalt concrete mixture, the Engineer may elect to modify the maximum size requirement. Not more than 20 percent, by weight, of recycled materials may be used in the mix.

505.02.09 Tolerances

After the mix formula is submitted, the several constituents shall meet the following tolerances, but always within the range of proportions specified in Subsection 507.02.06:

Asphalt Concrete Mix Tolerances

Constituent of Mixture	Tolerance (∀ to Job Mix Formula)
Aggregate passing 1", 3/4", 1/2" sieves	Within the range of the proportions specified in Subsection 505.02.06:
	Specifications
Aggregate passing ¼" sieve	6.0%

Aggregate passing No. 10 & No. 40 sieve	5.0%
Aggregate passing No. 200 sieve	2.0%
Asphalt cement	0.5%
Temperature of mixture at time it is placed in final position	240 - 300°F

Each day the Engineer shall be permitted to take as many samples as he considers necessary for checking the uniformity of the mixture. When unsatisfactory results or other conditions make it necessary, the Engineer may require a new mix formula.

Should a change in source of material be made, or should conditions arise which the Engineer determines to be justified, the Contractor shall establish a new job-mix formula.

The materials to be used in the work shall be of such nature that a mixture of them, proportioned in accordance with the mix formula, will have a retained strength of no less than 70% when tested in accordance with AASHTO T-165 as modified by OSHD test methods. The Engineer shall be permitted to take as many samples as he considers necessary for checking the uniformity of the mixture.

505.02.10 Feathering

Asphalt concrete for use in feathering at curb or gutter lines, at intersections, at connections with existing pavement, in spot patching, and under similar conditions, shall be a fine mix of asphalt concrete such as Class "D" mix.

505.03 CONSTRUCTION

505.03.01 Prepaving Conference

The Contractor and his supervisory personnel plus any subcontractors and their supervisory personnel who are to be involved in the paving work shall meet with the Project Manager and his representatives for a prepaving conference at a time mutually agreed upon. At this conference, the Contractor shall discuss his methods of accomplishing all phases of the paving work. The plan of the work, order of paving and other details of performance shall meet with the approval of the Engineer.

505.03.02 Preparation of Bases

All pavement bases and foundations constructed under this Contract shall be completed and finished as prescribed under the applicable specification for its construction.

Manholes, inlets, water valve boxes, and other such structures shall have been completed, cured, and otherwise prepared, as applicable, and made clean and ready for asphalt pavement. Unless otherwise approved, manholes shall be adjusted so that they can be paved over and then later adjusted as shown on the Standard Drawing. Paint vertical surfaces that will come in contact with asphalt pavement with tack coat material to provide a good bond and seal. Cover top surfaces with paper or other material to prevent adherence of asphalt pavement, tack coat, or prime coat.

505.03.03 Reconditioning Old Roadbed

This work consists of reconditioning and preparing previously constructed roadbed subgrades, existing stone bases and surfacings, and existing pavements; none of which were constructed by the Contractor under the pertinent Contract but on which an additional layer or course of material is to be placed.

Existing aggregate subbases, bases, and surfacings shall be bladed, scarified, leveled, and compacted in conformance to lines, grades, and cross sections as established and the density and tolerance requirements of Section 503 AGGREGATE BASES.

Prelevel uneven or broken bituminous, cement concrete, or brick surfaces with asphalt concrete as specified. Spread and compact preleveling asphalt concrete to the density and surface condition as directed.

505.03.04 Tack Coat

Asphalt shall consist of emulsified asphalts (CSS-1 or CSS-1h) or an approved equal.

Spread asphalt by means of pressure-spray equipment which will provide uniformity of application at prescribed rates. Do not apply aggregate cover material to the tack coat. Asphalt shall be applied to the prepared surface at a rate of 0.05 gallons per square yard for clean surfaces and up to 0.12 gallons per square yard for dirty surfaces. The tack coat shall not be applied during wet or cold weather or during darkness and apply only so far in advance as is appropriate to maintain a tacky, sticky condition of the asphalt. Apply tack coat in such a manner as to offer the least interference to traffic and to permit at least one-way traffic without pickup or tracking of asphalt.

505.03.05 Mixing

Mix the asphalt concrete by combining aggregate, asphalt, and additives at an approved central mixing plant equipped with controls to accurately measure and monitor the various components of the mix to produce a uniform homogeneous mixture at the specified temperature.

The discharge temperature of the mix will vary with the type of mixing plant, climatic conditions, and other variables. However, the temperature shall be sufficient to provide thorough mixing and coating and to provide a mass viscosity of the mix on the grade which will permit compaction to required density. Mix temperatures and asphalt in storage shall generally not exceed 325 degrees Fahrenheit.

505.03.06 Placing

Conform to the Drawing of work, order of paving, and other details of performance as approved. Lift thickness shall be as shown on the Drawing or specified.

Transport the asphalt concrete mixture from the mixing plant to the point of use in trucks. Send no loads so late in the day as to prevent the spreading and compacting of the mixture during daylight, unless approved lighting is provided.

Lay the mixture in strips of such width as to hold to a practical minimum the number of longitudinal joints required. The longitudinal joints in any layer of pavement shall be offset from those joints in layers below by not less than 12 inches. Before any paving is started, the Contractor shall submit a Drawing indicating locations of longitudinal joints to the Engineer for his review. Take special care at longitudinal joints to provide positive bond and required density.

Bituminous paving machines shall be self-contained, power-propelled units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing layers of bituminous mix material in lane widths applicable to the specified typical sections, and to required thicknesses, lines, grades, and cross sections. Machines used for shoulders and similar construction shall be capable of spreading and finishing to the widths shown.

When the capacity of the paver to properly spread and finish exceeds the rate of delivery of mixture, operate the paver at a reduced and uniform speed to give continuous spreading and finishing.

Take care at all times to prevent segregation in the mixture as evidenced by areas of fine and coarse materials, and correct any such segregation with fresh mixture either spread and worked into the surface or by complete removal and replacement of segregated mixture at no expense to the Owner. AT NO TIME SHALL THE COURSE AGGREGATE SEGREGATED FROM THE MIX FROM HAND SPREADING OR RAKING OF JOINTS BE SCATTERED ACROSS THE PAVED MAT. Such material shall be collected and disposed of.

On areas to be patched with asphalt concrete mixture and on areas of irregular shape or limited size, the spreading and finishing requirements may be modified as approved.

Boils and slicks occurring in the pavement must be immediately removed and replaced with suitable materials, at the sole expense of the Contractor.

505.03.07 Paving Plant and Equipment

All plant and equipment used by the Contractor in the preparation and mixing of asphalt concrete shall conform to the requirements of Section 403.33, "Standard Specifications for Highway Construction" as published by Oregon State Highway Division.

505.03.08 Weigh Scales

When materials are to be measured for payment by weighing on vehicle scales, the Contractor shall provide the scales and transport the materials to the scales provided.

The vehicle scales furnished shall be accurate within the tolerances required by State law and shall be licensed with the Oregon Department of Agriculture. Scales shall be suitable for the weighing to be done and shall be properly installed and maintained.

At each end of the vehicle scale there shall be a straight approach in the same plane as the platform. The approaches shall be of sufficient length and width to ensure the level positioning of combination vehicles longer than the scale platform during weight determinations. All vehicle brakes shall be released while combination vehicle are being weighed.

Vehicle scales shall be inspected and the accuracy tested every six months by either the State Department of Agriculture or a scale service company. Scales installed at a new site shall be inspected and the accuracy tested before use. Testing by a scale service company shall be done by using a minimum of 10,000 pounds of test weights certified by the State Department of Agriculture.

505.03.09 Hauling Equipment

Vehicles used for hauling asphalt concrete mixtures shall have tight, clean, and smooth beds which have been thinly coated with a minimum amount of paraffin oil, lime solution, soapy water or other approved material to prevent the mixture from adhering to the beds. Diesel oil may be used when requested by the Contractor and approved by the Engineer. Its use will be terminated by the Engineer if it is not being used as specified or is a source of contamination for the asphalt mix.

During each application of an approved coating material, and prior to loading, the vehicle bed shall be drained of all excess coating material by raising the truck bed, opening belly dump gates or operating the conveyer belt as appropriate for the type of equipment being used.

Vehicles which cause excessive segregation, which leak badly, or which delay normal operations, as such are determined by the Engineer, shall not be used.

Contractors hauling vehicles shall be so constructed and equipped with covers to protect against moisture and against heat loss, and shall have a 3/8-inch diameter hole near the middle of the left side wall of the bed to allow access for a thermometer.

505.03.10 Asphalt Concrete Pavers

Pavers shall be self-contained, power-propelled units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing layers of asphalt concrete material in widths applicable to the specified typical sections, and to required thicknesses, lines, grades and cross sections.

Extensions added to the paver when used on travel lanes shall have the same augering and screeding equipment as the rest of the paver.

The paver shall be equipped with a receiving and distribution system of sufficient capacity for a uniform spreading operation and capable of placing the mixture uniformly in front of the screed without segregation of materials.

The paver shall be designed to compensate for minor irregularities of the base on which it is supported so that such will not be reflected immediately in the surface of the layer being placed. The weight of the paver shall be supported on tracks or wheels none of which shall contact the mixture being

laid. The contact area of the screed or strike-off assembly shall be uniform over the entire width of the strip of mixture being placed.

The screed or strike-off assembly shall produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. The paver shall be equipped with either a manual or electronic line and grade control.

505.03.11 Weather Limitations

Hot mix asphalt concrete shall normally be placed on dry prepared surfaces and when air temperature in the shade is not less than those specified in the following table:

SURFACE TEMPERATURE LIMITATIONS

Compacted Thickness of Individual Courses	Travel Lanes/Wearing Course	All Other Courses
Less than 1½ inches	60°F	55°F
1½ inches to 2½ inches	50°F	45°F
Over 2½ inches and other	40°F	40°F

Place Class "E" wearing surface only when the existing pavement temperature is at least 60 degrees F. Placing of any mixture during rain or other adverse weather conditions normally will not be permitted, except that mix in transit at the time these adverse conditions may occur may be laid provided it is of proper temperature, the mix has been covered during transit, and is placed on a foundation free from pools or flow of water and if all other requirements of these specifications are met. Asphalt concrete mixtures shall not be placed when the underlying layer is frozen, or when, in the opinion of the Engineer, weather conditions either existing or expected will prevent the proper handling, finishing, or compaction of the mixtures. The temperature of hot mix at the time it is spread into final position shall be between 240 and 300 degrees Fahrenheit, except Class "E" mix shall be between 200 and 250 degrees Fahrenheit.

505.03.12 Compaction

The Contractor will not be permitted to use any equipment which crushes the aggregate to any extent. However, he will be required to obtain the densities required in Subsection 505.03.14.

505.03.13 Compactors

Rollers shall be steel wheel, pneumatic tire, vibratory or a combination of these types as the Contractor may elect. They shall be in good condition and capable of reversing without backlash.

505.03.13A Steel Wheel Rollers

Steel wheel rollers shall have a minimum gross static weight of 8 tons and a minimum static weight on the drive wheel of 250 pounds per inch of width. For finish rolling a 6-ton minimum gross static weight is acceptable and the 250 pounds per inch of width will not be required.

505.03.13B Vibratory Rollers

Vibratory rollers shall be equipped with amplitude and frequency controls and shall be specifically designed for compaction of asphalt concrete mixtures. The rollers shall be capable of frequencies of not less than 2,000 vibrations per minute.

505.03.13C Pneumatic Rollers

The pneumatic-tired rollers shall be self-propelled, tandem, or multiple axle, multiple wheel type with smooth-tread pneumatic tires of equal size staggered on the axles at such spacings and overlaps as will provide uniform compacting pressure for the full compacting width of the roller and shall be capable of exerting ground pressures of at least 800 pounds per square inch of tire contact area.

Pneumatic-tired rollers shall be fully skirted to insulate the tires from significant heat loss during compaction.

505.03.14 Density Requirements

The density of asphaltic concrete shall be at least 92% of Rice theoretical maximum density as determined in conformance with AASHTO T-209 as modified by OSHD.

Asphaltic concrete pavements which do not meet substantial compliance requirements for compaction, and are deemed by the Engineer to be not suitable for use, will be rejected. Any rejected material shall be removed. No payment will be made for the rejected material or for removal of the rejected material.

Asphaltic concrete pavements which do not meet substantial compliance requirements for compaction, but are deemed by the Engineer to be suitable for use, may be left in place if the Contractor so elects. A price reduction for such materials will be determined as follows:

The percentage below the required density will be squared and the result rounded off to the nearest whole figure. A percentage deduction equal to the resulting figure will be made to the in place price. Any pavement with a density less than 89% will not be considered suitable.

Samples and tests will be taken as frequently and at such locations as the Engineer elects, and the results will be made known to the Contractor as soon as is practicably possible. However, it shall be the responsibility of the Contractor to obtain specified density at all times, and delay in advising the Contractor of test results shall not act as a waiver of this responsibility. When it is determined that specified density is not being obtained, discontinue all paving operations until corrective measures have been taken.

Any displacement occurring as a result of the reversing of the direction of a roller, or from other causes, shall be corrected at once by the use of rakes and addition to fresh mixture when required. Do not displace the line and grade of edges. Moisten steel roller wheels with water or other approved material to the least extent necessary to prevent pickup of mixture and yet not cause spotting or defacement of the surface of the mixture.

Along curbs and walls, on walks, irregular areas, and other areas not practicably accessible to specified rollers, compact the mixture with small rollers, mechanical tampers, hot hand tampers, or smoothing irons. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Remove and replace any mixture that becomes loose and broken, mixed with dirt, or is defective in any way. Remove and replace any area showing an excess or deficiency of bituminous cement. Removal and replacement under these provisions shall be at the sole expense of the Contractor.

505.03.15 Transverse Joints

Form transverse joints by cutting back on the previous run to expose the full depth of the layer or course.

Place a course or strip of asphalt concrete as nearly continuous as practicable. Carefully construct transverse joints using vertical faces and thoroughly compacted to provide a smooth riding surface. Apply a coat of bituminous material to contact surfaces just before mixture is placed against previously rolled mixture. The Contractor shall use a 10-foot straight edge to determine the location of the full depth vertical faces.

At bridge ends or at joints with other rigid type structures, existing bases shall be conditioned and compacted, and place asphalt concrete to extra thickness and compact in transverse direction as well as longitudinally.

When the end of a course or strip of asphalt concrete is to be temporarily subject to traffic, the end shall be left on a bevel of approximately 20:1 (horizontal to vertical), being later cut back to a vertical edge.

505.03.16 Construction Joints

Placing of a course or strip of asphalt concrete shall be as nearly continuous as practicable. Transverse joints shall be carefully constructed and thoroughly compacted to provide a smooth riding surface.

The mixture shall be laid in strips of such widths as to hold to a practical minimum the number of longitudinal joints required. Longitudinal joints in the wearing course shall not occur within the area or width of a traffic lane or auxiliary lane. On median lanes and on shoulder areas such joints shall occur only at points of change in the transverse slopes as shown on the plans or designated by the Engineer. The longitudinal joints in one layer shall offset those in the layer immediately below by a minimum of 12 inches. Underlying longitudinal joints shall be within 12 inches of the edge of a lane or within 12 inches of the center of a lane, except in irregular areas, or if otherwise shown on the plans.

When the end of a course or strip of asphalt concrete is to be temporarily subjected to traffic, the end shall be on a bevel of approximately 20:1 (horizontal to vertical), being later cut back to a vertical edge to provide a fresh surface against which subsequently placed asphalt concrete is to abut.

When placing of asphalt concrete pavement in layers in excess of 2-inch nominal thickness is being performed under traffic, work shall be scheduled in a manner such that at the end of each business day, the full width of the area to be paved shall be completed to the same elevation with no longitudinal drop-offs within this width.

When placing of asphalt concrete pavement in layers of 2 inches or less in thickness is being performed under traffic, work shall be scheduled in a manner such that at the end of each working shift, one strip of new travel lane pavement shall not extend ahead of the adjoining strip of travel lane pavement more than the distance normally covered by each shift.

Where abrupt or sloped drop-offs occur within or at the edge of the paved surface, the Contractor shall construct and maintain a wedge of asphalt concrete at a Slope 10:1 or flatter along the exposed joint.

505.03.17 Thickness and Number of Layers

Asphalt concrete shall be placed in the number of courses and to the total compacted thickness per course called for by the typical cross sections given on the plans.

In case the course of pavement involves the placing of a layer of variable thickness, as for leveling existing irregular surfacings, the course may include or consist of a layer of asphalt concrete of variable compacted thickness, the thickness of which layer shall not exceed the following:

Type of Mix	Maximum Compacted Thickness Layers
"A"	4 Inches
"B"	3 Inches
"C"	2 Inches
"D"	1 Inch

The top surface of each layer of asphalt concrete shall be spread at grade and cross section closely paralleling the specified top surface of the finished pavement.

505.03.18 Pavement Samples

The Engineer shall be permitted to cut samples or to take cores from the full depth of compacted mixture or from the separate layers and courses thereof, for testing purposes, and at such locations and at such frequencies as the Engineer determines necessary for proper representation.

Where samples have been taken, and when directed by the Engineer, the Contractor shall furnish new like material for filling the holes with no extra compensation.

505.03.19 Pavement Smoothness

The top surface of the asphalt concrete pavement, when tested with a 12-foot straightedge either parallel to or perpendicular to the centerline furnished and operated by the Contractor, shall not vary by more than 0.02 foot. The Engineer will observe this testing and may require additional testing. The means of correction of a surface that does not meet the smoothness requirements shall have the approval of the Engineer.

When tests show the pavement is not within the above tolerances, the Contractor shall take immediate action to correct equipment or procedures in his paving operation to eliminate the unacceptable pavement roughness.

Any surface irregularities exceeding the above tolerances shall be corrected by the Contractor using a method or methods listed herein and approved by the Engineer.

Corrective Action - Corrective measures by the Contractor requiring one or more of the following actions approved by the Engineer shall be performed on deficient areas:

1. Remove and replace the surface course.
2. Place an overlay of a thickness approved by the Engineer.
3. Grind the pavement surface utilizing diamond blades up to a maximum depth of 0.3 inch and apply an emulsion fog coat as directed by the Engineer.

When utility appurtenances such as manhole covers and valve boxes are located in the traveled way and they are not required to be adjusted or are required to be adjusted before paving, these tolerances will not apply at the utility appurtenance.

All corrective work shall be completed within 10 business days following notification from the Engineer that the pavement does not meet the specified tolerances, unless otherwise directed by the Engineer.

All corrective work, including furnishing of materials, shall be performed at the Contractor's expense and no adjustment in contract time will be made for corrective action work.

505.03.20 Special Protection Under Traffic

In addition to other required provisions for traffic, the following shall apply to pavement construction: no traffic or equipment shall come in contact with the compacted mixture until it has cooled and set sufficiently to prevent marking; edges shall be protected from being broken down; and edge drop-offs one or more inches in height shall be marked with warning devices visible by day and night to the traveling public, and placed at spacings indicated on the plans or as directed by the Engineer.

505.04 MEASUREMENT AND PAYMENT

505.04.01 Measurement

Pay quantities for hot mix asphalt concrete and other bituminous construction under this Section will be measured by one or another of the methods as set forth hereinafter.

505.04.01A Asphalt Concrete on a Single Unit Basis

When pay items in the Proposal so indicate, the quantity of asphalt concrete used in the accepted work as specified will be measured on a ton basis. There will be no separate measurement of bituminous cement or additives contained in the mixture or used otherwise in the work. Measurement will be made on the number of tons of asphalt concrete, as weighed on approved and tested scales. Give trip tickets to the Engineer for his signature as the material is delivered. Each trip ticket shall show date and time of delivery, truck number, driver's name, net weight of material, and will be considered as valid

delivery receipts only when signed by the Engineer. No material will be accepted without a trip ticket being available at the time of delivery.

505.04.01B Asphalt Concrete on Square Yard Basis

When the pay items in the Proposal so indicate, asphalt concrete, complete in place, as specified and accepted, will be measured on a square yard basis. Measurement will be made of width and length of each separately constructed strip of pavement, wherein width is the design width or edge-to-edge width of pavement, whichever is the lesser, and length is from end to end of the pavement along the center of the strip. Measurement will be on the surface of the pavement to the nearest 0.1 foot and the square yardage will be to the nearest full square yard.

The Engineer may take core samples of the pavement or use other methods to determine the actual pavement thickness constructed. Extra thickness of pavement as shown or as directed will be measured by conversion on a proportionate volume basis to an equivalent number of square yards of specified standard thickness pavement.

No additional payment over the Contract unit price shall be made for pavement having a thickness greater than shown or ordered. When the pavement is found deficient in thickness by more than 0.2 inch, but not more than 0.6 inch, as determined by test cores of reasonable test samplings, payment for pavement will be made at an adjusted price on a proportionate depth basis.

505.04.02 Payment

Payment will be made for any or all of the following items when listed as pay items in the Proposal for any particular Contract:

	Payment Item	Unit of Measure
1.	Asphalt concrete mixture (specify class)	Per Ton
2.	Asphalt concrete (specify class & thickness)	Per S.Y.

A deduction of 1% of the in place price will be made for each 1% cumulative deviation from the allowable tolerance of each component of the job mix formula required by the specification, except as follows:

Deviations in asphalt cement shall be weighted 8-times, and deviations in 200-minus material shall be weighted 2-times the deviation in other specified aggregate sieve sizes.

All materials furnished where the cumulative deviation equals or exceeds 12% shall be removed and replaced with acceptable material at the sole expense of the Contractor.

When asphalt paving materials with a cumulative deviation of less than 12% are furnished, the Owner shall notify the Contractor, in writing, to remove and replace defective materials at the sole expense of the Contractor or to pay to the Owner liquidated damages in accordance with the above deduction schedule and provide an additional one year extension to the warranty.

****

506 PORTLAND CEMENT CONCRETE PAVEMENT

****

506.01 DESCRIPTION

This section covers work necessary for construction of Portland cement concrete pavements, with or without reinforcement, on a prepared subgrade or base course, complete.

506.02 MATERIALS

All material shall conform to requirements of Section 206 MATERIALS - TYPES AND USE.

506.03 CONSTRUCTION

506.03.01 General

The plant, equipment, and tools required in the performance of the work must be of the design, capacity, and in condition to efficiently perform their respective functions of the work. Schedule and coordinate all operations involved in constructing the pavement so that regardless of the daily or seasonal variations in weather, temperature, and humidity under which the work is permitted to proceed, such work will result in a finished pavement conforming in all respects to specified requirements. Provide and have available at all times adequate equipment, tools, materials, and labor to achieve these results and failure to so provide will be cause for discontinuance or rejection of the work upon order of the Engineer. Conform to applicable requirements of concrete construction in Section 701 CONCRETE STRUCTURES.

506.03.02 Preparation of Concrete Mix

Before beginning any concrete work, the Contractor shall, at the Engineer's request, have the concrete mix designed and submit the mix design for approval. The mix design shall be tested by a laboratory approved by the Engineer by preparing trial batches from each of which four standard test cylinders shall be cast, cured and tested as specified for the job concrete. Certified copies of all laboratory reports, stating whether or not the items reported meet specifications, shall be sent directly to the Engineer from the testing laboratory.

Portland cement, fine aggregate, coarse aggregate in required separated sizes, water, air-entraining agents and other admixtures as required, shall be used in the concrete in such proportions as may be determined to be necessary to produce a concrete of suitable workability, plasticity and entrained-air content and of such strength as the conditions to be met may require. The proportions may be changed by the Engineer from time to time during the progress of the work, but they shall at no time be such that test cylinders of the resultant concrete, made in accordance with the applicable provisions of AASHTO T-23 and tested as set forth in OSHD TM-719, will show compressive strengths of less than 4,000 pounds per square inch at an age of 28 days.

Changes in proportions, and particularly in the proportion of cement, may be made not only for the purpose of causing the concrete to meet specified 28-day requirements but also to produce concrete of high early strength when concrete of that kind is required. The maximum amount of cement to be used shall be 750 pounds per cubic yard of concrete.

The proportions of water to be used shall be determined by the Engineer, it being the intent of the specification to have the water-cement ratio held as low as is consistent with the production of a workable, uniform and dense concrete. The maximum water-cement ratio shall be six gallons of water per 94 pounds of cement.

Entrained air in the concrete shall be as directed by the Engineer and normally will be from four to six percent by volume. The entrained air shall be obtained by use of air-entraining cement, by air-entraining additives or admixtures, or by combinations thereof as may become necessary and as the Engineer may approve.

The Contractor shall provide and use approved means for the adding of controlled amounts of additives, admixtures and retardants to the mix.

No change in the source or character of any material shall be made without due notice to the Engineer. No material shall be used in the mix until the Engineer has approved such material and has designated the proportions of the materials in the mix based on the use of such approved materials.

506.03.03 Hauling

Hauling of Portland cement concrete mixed at a central plant or in transit will conform to the provisions of Section 701 CONCRETE STRUCTURES.

506.03.04 Forms

Conform to the applicable requirements of Forms in Section 701 CONCRETE STRUCTURES.

506.03.05 Handling and Placing

Conform to requirements for Handling and Placing in Section 701 CONCRETE STRUCTURES.

During the placing of concrete, making provision for the construction of joints and the placing of dowels, tie bars, and other devices as shown. The Contractor is referred to DIVISION SEVEN - CONCRETE STRUCTURES TECHNICAL REQUIREMENTS.

506.03.06 Preparation of Roadway

Before paving operations are commenced, the base constructed under the contract and on which the pavement is to be constructed and shall be in or brought to the completed and finished condition prescribed under the applicable specification for its construction. Old base and foundations constructed under other contracts shall be brought by the Contractor to an acceptable condition as prescribed in these specifications.

In addition to the base under the pavement, an area of sufficient width alongside the pavement base which will support the paving equipment shall be brought to proper grade and compacted so as to support the equipment at proper grade and cross section. The base for the pavement shall be maintained and firm and true to established grade and cross section until the concrete is placed thereon.

Manholes, inlets, and other such structures shall have been completed, adjusted, cured, and otherwise prepared, as applicable, and made clean and ready to have concrete placed in contact therewith. Manhole frames and other independent metal structures in the pavement area shall be painted with suitable asphalt material.

The conditioned base shall be in a compacted and smooth condition when the concrete is placed thereon, and shall be moist. Watering of the base shall be thorough and uniform.

The Engineer shall be permitted to place plates on prepared base and to reference them for later determination of thickness of concrete, and the Contractor shall exercise care to preserve such plates from displacement.

506.03.07 Weather Limitations

Except with written permission from the Engineer, construction of Portland cement concrete pavement shall not be in progress or continued when a descending air temperature in the shade and away from artificial heat reaches 35°F. Unless otherwise permitted, the temperature of the mix shall be not less than 50°F nor more than 80°F at the time of placing. Material containing frost or lumps of hardened material shall not be used.

Concreting operations shall be discontinued upon order due to insufficient natural light, unless an adequate and approved artificial lighting system is provided and operated.

When concrete is being placed during cold weather and the air temperature may be expected to drop below 35°, a sufficient supply of straw, hay, grass, or other suitable blanketing material shall be provided along the work. Any time the air temperature may be expected to reach the freezing point during the day or night, the material so provided shall be spread over the pavement to a sufficient depth to prevent freezing of the concrete. If required by the Engineer, concrete laid less than 24 hours shall also be covered by approved canvas or similar enclosures and devices capable of protecting the concrete from freezing. Any concrete injured by frost action shall be removed and replaced at the Contractor's expense.

The Contractor shall have available at all times materials for the protection of the edges and surface of the unhardened concrete from the effects of rain or other precipitation. Protective material may consist of sheets of burlap, paper or plastic film. It will be the Contractor's responsibility to protect the pavement from damage, and failure to properly protect unhardened concrete may constitute cause for the removal and replacement of defective pavement at the Contractor's expense.

506.03.08 Slip Form Paving

Place the concrete uniformly in final position by the slip form method in one complete pass in such a manner that a minimum of finishing will be necessary to provide a dense and homogeneous pavement in conformance to true grade and cross section. The machine shall vibrate the concrete for the full width and depth of the pavement being placed. Such vibration shall be accomplished with vibrating tubes or arms working in the concrete. The sliding forms shall be rigidly held together to prevent spreading of the forms. Use forms of sufficient length so that no appreciable slumping of the concrete will occur.

Operate the slip form paver with as nearly continuous forward movement as possible and coordinate all operations of mixing, delivery, and spreading concrete to provide uniform progress. Stopping and starting the paving machine shall be held to an absolute minimum. If, for any reason, it is necessary to stop the forward motion of the paver, stop the vibratory and tamping elements immediately. Apply no tractive force to the machine, except that which is controlled from the machine. The Contractor shall stop his operation immediately if the finished work is not of specified quality. Deficient areas shall be repaired before the concrete starts to set.

Ensure that supports of the slip form paver and other equipment which ride on previously placed pavement are offset over that pavement sufficiently to prevent breakage of the edge thereof and provide such supports with suitable protective means to avoid marring or chipping of the previously placed pavement.

Hand-spreading and distributing shall be with shovels, not rakes, and the concrete shall not be fouled with foreign matter, nor shall joint devices be disturbed during such operations. The Contractor shall furnish hand operated mechanical vibrators of a type and design approved by the Engineer. These vibrators shall be used in the consolidation of the concrete pavement within at least six feet on each side of construction and expansion joints and such other areas as the Engineer may direct.

During the placing of concrete, provision shall be made for the construction of joints and the placing of dowels, tie bars and other devices as called for by the plans or as directed by the Engineer.

Concrete that is not in place within 45 minutes after being mixed (or one hour if mixed at a central plant or in transit) shall be subject to rejection and wasting at the direction of the Engineer. Concrete which has begun to harden or take an initial set prior to placement, or which has been retempered with water will be rejected and shall be wasted by the Contractor in an approved manner and at his own expense.

506.03.09 Tamping and Screeding

Compact the concrete pavement by means of vibrating screeds, mechanical tampers, tamping templates, and such other implements as approved. A vibratory screed or an automatic screeding and tamping machine may be substituted for a tamping template, subject to approval. Operate the equipment in such a manner that a satisfactory compaction of the concrete is produced and the surface of the pavement is uniform, true to grade and cross section.

Immediately after placing concrete upon the subgrade and before initial set has occurred, strike off the concrete and tamp by means of a tamping template, used at right angles to the centerline of the street, until the concrete is thoroughly consolidated to specified grade and crown section and sufficient mortar is brought to the surface for finishing purposes. If the design or location of the base is such as to preclude the possibility of tamping as previously described, such as a variable crown section, curb being constructed monolithic with base, in alleys, or where the grade exceeds 10 percent; employ other approved methods to obtain the prescribed results.

506.03.10 Finishing

After the concrete is placed and compacted, strike it true to line, grade, and cross section as shown and float to a smooth, even texture with an approved long handled wood float having a troweling or smoothing surface from 6 to 12 inches wide, or other approved floating device. Apply the float to the surface of the concrete with its length parallel to the centerline of the street and operate it from bridges, planing off the high places and filling the low places. Lap preceding applications of the float by at least one-half its length. If, after such planing, low places are discovered in the surface of the concrete, add specified grade, cross section, and surface tolerance, with a surface free from latence, soupy mortar, marks, or irregularities.

Following the float finish and at the proper set, broom finish the surface. Draw the broom transversely across the pavement with not more than one stroke per width of broom. Fill any areas of minor honeycomb or other minor defect in composition of the concrete along the exposed edges with a stiff mortar or cement and fine aggregate applied to the moistened concrete in a workmanlike manner. Areas showing serious defects in composition of the concrete shall be cause for removal of affected pavement and replacement with pavement of specified quality for the full width of strip between longitudinal joints or edges and for a length not less than 10 feet.

Tool the free edges of new pavement and joints with previously placed Portland Cement concrete with an approved edging tool to remove laitance and mortar resulting from finishing operations and to provide a clean rounded edge to the new pavement. Tooling shall not form ridges on the surface of the concrete. Perform tooling of edges at transverse joints and longitudinal joints are directed.

506.03.11 Joints

Conform to applicable requirements of Section 701 CONCRETE STRUCTURES and Special Conditions.

506.03.12 Tolerances

At the conclusion of the finishing operation the surface of the pavement shall not vary from a true surface, when tested with a 12-foot testing straight-edge, more than 0.02 of a foot in 12 feet.

The finished surface shall not vary more than 0.03 foot from the Drawing elevations at any point.

If the surface smoothness of the pavement after curing is found to exceed the tolerance permitted, grind the high spots until they meet the tolerance. The practicable extend of grinding shall not exceed 0.5 inch, nor create spalling of aggregate nor create deficiencies in pavement thickness. Low spots, if in hardened concrete may be filled with an approved epoxy grout provided such filling is performed in a neat, workmanlike manner and blend inconspicuously with adjoining concrete. All grinding to be at the sole expense of the Contractor.

506.03.13 Curing

506.03.13A Curing of Concrete

Immediately after the final floating, surface finishing, and edging has been completed and while the concrete surface is still moist, cover the entire exposed concrete and cure in accordance with one of the following provisions as specified:

1. Apply membrane-forming compound of the white pigmented type uniformly to damp concrete by pressure-spray methods at a rate which will form an impervious membranes when tested in accordance with AASHTO T-155.

2. Apply white polyethylene film, waterproof paper or burlap polyethylene sheets to damp concrete as soon as it can be placed without marring the surface. Place in intimate contact with the surface, extend over and beyond the sides or edges of the slabs or forms and weight as approved to hold the covering in position as a moisture proof covering. Laps shall be of approved dimensions and design to maintain tightness equivalent to the covering.

3. Apply burlap cloth to damp concrete as soon as it can be placed without marring the surface. Saturate the cloth with water and keep fully wetted during the curing period.

Regardless of which of the above methods the Contractor chooses, keep the curing medium intact and effective for a period of not less than 72 hours after application.

506.03.13B Protection of Concrete

Erect and maintain suitable barriers to protect the concrete from traffic or other detrimental trespass until the pavement is opened to traffic. If necessary, maintain watchmen to ensure that barriers remain effective.

Wherever it is necessary that traffic including Contractor's vehicles and equipment be carried from one side of the pavement to the other, construct and maintain suitable bridges over the pavement.

Prior to allowing equipment or traffic on the new surface, the concrete must have attained the specified compressive strength and shall be free from scarring, abrasion, stones, loose mortar, and other matter apt to be deleterious to the concrete surface. Operate all equipment without damage to the new concrete.

Repair or replace any part of the pavement, as directed, which has been damaged by traffic or from any other cause, prior to its official acceptance, at the sole expense of the Contractor.

506.04 MEASUREMENT AND PAYMENT

506.04.01 Measurement

506.04.01A Portland Cement Concrete Pavement

Measurement of Portland Cement concrete pavement will be made on a square yard basis for the pavement complete in place as specified, and accepted. Measurement will be made of width and length of each separately constructed strip of pavement, wherein the width is the design width or edge-to-edge width of pavement, whichever is the lesser, and the length is from end to end of p-avement to the nearest 0.1 foot and the square yardage shall be to the nearest square yard.

Extra thickness of pavement, when shown or specifically directed to be placed, will be measured by conversion on a proportionate volume basis to an equivalent number of square yards of specified standard thickness pavement.

506.04.02 Payment

Payment will be made for any or all of the following items when listed as pay items in the Proposal for any particular contract.

	Payment Item	Unit of Measure
1.	Continuous Reinforced Concrete Pavement (specify class, thickness, reinforcing steel)	Per S.Y.
2.	Reinforced Concrete Pavement (specify class, thickness, reinforcing steel)	Per S.Y.
3.	Plain Concrete Pavement (specify class, thickness)	Per S.Y.

Payment for concrete pavement, whether continuously reinforced, reinforced, or plain shall be full compensation for furnishing and placing all materials including water, reinforcement, joint materials, dowels, tie bars, and performing all work specified to complete the item including preparation of the base.

****

507 CURBS, GUTTERS, DRIVEWAYS, AND SIDEWALKS

****

507.01 DESCRIPTION

This section covers work necessary for the construction of curbs, gutters, combination curb and gutter, combination of curb, gutter and sidewalk, islands, traffic separators, driveways, sidewalks, and pathways hereinafter referred to collectively as structures.

The respective structure names are specific in their use and refer specifically to those names as shown.

507.02 MATERIALS

507.02.01 General

Materials shall conform to requirements of Section 206 MATERIALS - TYPES AND USE and to additional requirements contained herein.

507.02.02 Portland Cement Concrete for Extrusions

Grade the combined aggregates within the following limits:

Sieve Sizes	Total Passing Percent by Weight
½"	100
3/8"	75 - 100
No. 4	50 - 75
No. 16	20 - 40
No. 30	12 - 23
No. 50	5 - 15
No. 100	0 - 5

507.02.03 Portland Cement Concrete

Portland Cement concrete shall conform to Subsection 206.02.02 except that extruded curbs and/or gutters shall have a maximum slump of 2".

507.02.04 Aggregate

Aggregate materials for base, foundation, courses, leveling courses, or bedding shall conform to 1"-0" gradation in Section 503 AGGREGATE BASES.

507.03 CONSTRUCTION

507.03.01 Preparation of Base

507.03.01A Earthwork

When roadway earthwork is called for in connection with other items of work under the same contract which includes structure construction under this section, all excavation, backfilling, and

berm construction for the structures and in the vicinities thereof as required or as shown shall conform to applicable requirements of Section 205 EXCAVATION, EMBANKMENT, BEDDING, AND BACKFILL.

507.03.01B Aggregate Foundation or Bedding

Construct sidewalk structures on aggregate foundation course or bedding of selected granular material as specified.

When structures are to be constructed on areas where approved aggregate material is already in place, such materials may be salvaged and reused as bedding.

Foundation courses or beddings involving the furnishing of new materials shall be constructed in conformance to the applicable requirements of Section 503 AGGREGATE BASES.

507.03.01C Base for Portland Cement Concrete

All bases upon which new cement concrete structures are to be constructed shall be firm and free of all deleterious matter. Dampen thoroughly surfaces upon which new cement concrete is to be placed. No payment will be made for water and the work of placing base materials. The cost of preparing bases shall be considered as incidental to the construction of structures.

When new concrete is placed by the mechanical extrusion method, vertical dowel fastening to underlying concrete or asphalt may be eliminated and the bond between new concrete and underlying concrete or asphalt provided with epoxy cement applied in conformance with the manufacturer's recommendations as approved. Spread epoxy at a rate which will provide a thorough coating to the surface with all voids and depressions filled. Place new structure on the epoxy cement within 15 minutes after spreading.

507.03.02 Forms

507.03.02A Forms

Conform to requirements for Forms in Section 701 CONCRETE STRUCTURES.

507.03.03 Equipment

Plant and equipment requirements as described in Section 505 ASPHALT CONCRETE PAVEMENT and Section 506 PORTLAND CEMENT CONCRETE PAVEMENT may be modified as approved, when circumstances warrant. For asphalt sidewalks or islands, spread asphalt concrete by small or special pavers, by spreader boxes, or by blade graders. Compact with small, self-propelled rollers, vibratory compactors, or mechanical tampers. Spread or compact the mixture by hand methods only when approved.

The machine for extruding cement concrete curb or asphalt concrete curb shall be of the self-propelled type equipped with a material hopper, distributing screw, and adjustable curb forming devices capable of placing and compacting cement concrete or asphalt concrete to the lines, grades, and cross section as shown, in an even homogeneous manner. Cement concrete curb shall be free of honeycomb and cracks.

Set top of curb grade by an offset guide line using the survey marks established by the Engineer. The forming tube portion of the extrusion machine shall be readily adjustable vertically during the forward motion of the machine to provide, when necessary, a variable height of curb conforming to the predetermined curb grade. A grade line gauge or pointer shall be attached to the machine in such manner that a continual comparison can be made between the curb being placed and established curb grade as indicated by the offset guide line.

In lieu of the above method for maintaining the curb grade, the extrusion machine may be operated on approved rails or forms set at the proper relative grade.

507.03.04 Placing Material

No asphalt or concrete shall be placed until the surface and forms, where used, have been inspected and approved.

507.03.04A Portland Cement Concrete

Construct Portland Cement concrete structures between specified forms or by an mechanical extrusion method, as the Contractor may elect. If forms are used, maintain a 2- to 4-inch slump, and thoroughly compact and strike off. If the structures are constructed by a mechanical extrusion method, maintain a maximum slump of two inches. Feed cement concrete into the extruding machine at a uniform rate and operate the machine under sufficient restraint in a forward motion to produce a well-compacted mass of concrete.

507.03.05 Finishing

507.03.05A General

Construct all structures within ¼ inch of true line and within ¼ inch of established surface grade, cross section and slope, and within ¼ inch of specified thickness, and all finished surfaces shall be free from humps, sags, or other irregularities. When a straightedge 10 feet long is laid on a finished surface, the surface shall not vary more than 0.02 feet from edge of the straightedge. At no time shall the concrete surface be allowed to pool water.

Where Portland Cement concrete sidewalks or pathways are to be placed around or adjacent to manholes, pipe inlets, or other miscellaneous structures, form around the miscellaneous structure and allow a minimum of 18" of clearance, after the sidewalk is poured and cured, adjust miscellaneous structures to grade and finish placing the sidewalk or pathway.

507.03.05B Portland Cement Concrete

Sidewalks and Other Structures:

Finish surface of concrete to grade and cross section with a bull float, trowel smooth, score if required, then finish with a broom. Use floats of not less than 10 feet in length for straight grade sections and not less than 5 inches in width. Finish concrete adjacent to expansion joints with an edger tool. Light brooming shall be transverse to the line of traffic, and if water is necessary, it shall be lightly applied to the surface immediately in advance of brooming.

The surface of concrete sidewalks shall be marked into rectangles with a scoring tool which will leave the edges rounded. Scoring and dimensions shall be as shown on the appropriate Standard Drawing or as directed. Sidewalks shall have a slope of ¼ inch per foot from the top of curb to the back of walk unless otherwise shown.

Curbs:

Remove forms after the concrete has taken initial set and while the concrete is still green. Minor defects shall be repaired with mortar containing one part Portland Cement and two parts sand. Plastering will not be permitted on the faces and exposed surfaces. Honeycombed and other structurally defective concrete shall be removed and replaced at no expense to OWNER. While the concrete is still green, finish exposed surfaces as required to provide a uniform texture and smooth surface.

When constructing precast concrete curbs, the proportions of sand, gravel and cement, the type of forms used, and the method of compacting the concrete in the forms shall all be such that as dense, smooth and uniform a surface as is practicable for a concrete masonry unit will be obtained on the finished curb units. The faces that are to be exposed shall be free from chips, cracks, air holes, honeycomb or other imperfections except that if there be no more than 5 percent of the curb units having slight cracks, small chips not larger than ½ inch, or air holes not more than ½ inch in diameter or depth, the imperfections will not be deemed grounds for rejection.

Furnish and install a minimum of two 3-inch PVC Sch. 40 pipe curb drains to serve each lot. Blockouts shall be of adequate size to accommodate a 3-inch PVC drain pipe. PVC pipe shall conform to ASTM D-2241. Curb drains will be considered incidental work for which no separate payment will be made.

507.03.06 Curing Portland Cement Concrete

After the concrete has been placed and finished in curb structures, as specified, it shall be cured by application of a white pigmented liquid membrane-forming compound applied uniformly to the damp concrete by pressure spray methods, or by keeping the concrete protected and moist for at least 72 hours. The concrete structure shall be kept from contact and strain for at least 7 days.

Curing of concrete in all other structures shall conform to the requirements for Curing in Section 506 PORTLAND CEMENT CONCRETE PAVEMENT.

507.03.07 Joints in Portland Cement Concrete

Contraction Joints in Walks and Incidental Surfacing:

Form transverse contraction joints of the weakened plane or dummy type in the exposed surfaces of cement concrete walks and incidental surfacings at such locations as are required to confine the contraction joint spacing to a maximum of fifteen (15) feet. The joints shall be formed to a depth of 1/3 of the thickness of concrete and to a width of about 1/8 inch. Joint edges shall be tooled.

Contraction Joints in Curbs:

Place contraction joints in curbs at intervals not exceeding fifteen (15) feet. Contraction joints shall be of the open joint type and shall be provided by inserting a thin, oiled steel sheet vertically in the fresh concrete to force coarse aggregate away from the joint. The steel sheet shall be inserted ½ the depth of the curb. After initial set has occurred in the concrete and prior to removing the front curb form, the steel sheet shall be removed with a sawing motion. Finish top of curb with a steel trowel and finish edges with a steel edging tool. Contraction and expansion joints of curbs should coincide with joints in sidewalks and streets.

Expansion Joints:

Transverse expansion joints for curbs shall be provided opposite abutting expansion joints in abutting Portland cement concrete, over expansion joints in concrete underlying the new concrete, and at each point of tangency in the structure alignment. Additional transverse expansion joints shall be provided at other locations as required to confine the expansion joint spacing to the maximum distance indicated on the plans. The width of joint and thickness of filler shall match those of the joints in abutting or underlying concrete, and elsewhere shall be not less than 1/2 inch. Each expansion joint shall be at right angles to the structure alignment, normal to the structure surface, and shall provide complete separation of new concrete.

Expansion joints for sidewalks and driveways shall be provided between driveways and Portland cement concrete pavements, transversely in walks at a distance of six to eight feet in from curbs which occur at walk ends, transversely in walks opposite expansion joints in adjoining curbs and elsewhere at such locations in the walk that the distance between transverse expansion joints does not exceed 45 feet; around poles, posts, boxes, and other fixtures which protrude through, into or against the structures; and alongside or transverse to the new surfacing at such locations and frequencies as is necessary to provide for expansion of both new and abutting Portland cement concrete.

Width of joint and thickness of filler shall not be less than . inch, and where the new concrete surfacing abuts other surfacing, shall be not less than ½ inch. Generally, transverse expansion joints shall be at right angles to the alignment, vertical to the surface, and shall provide complete separation of new concrete.

Requirements Near Existing Structures:

Cut back existing curbs, walks, driveways and other such structures to permit the new construction and where the new structures are to be constructed against or within 4 inches of the end, edge or side of other structures, the new construction shall include the construction of approved connections therewith, using the same kind of concrete as is used in the new construction. Make the joint between the old and new material with a saw cut.

507.03.08 Dowels, Tie Bars, Reinforcing

Provide metal reinforcing bars and wire fabric reinforcement when and as shown. When shown, provide and place dowels with "slip sleeves" as load transfer mediums. Provide and place dowels, but without "slip sleeves," as fastenings or ties between new concrete and existing underlying concrete when shown. Provide tie bars when shown. Place reinforcing, dowels and tie bars in conformance to the applicable requirements in Section 702 REINFORCEMENT.

507.04 MEASUREMENT AND PAYMENT

507.04.01 Measurement

507.04.01A Curbs

Curb will be measured on a linear foot basis along the face of the curb for the actual length constructed.

507.04.01B Combination Curb and Gutter

Combination curb and gutter will be measured on a linear foot basis along the face of the curb for the actual length constructed.

507.04.01C Curb, Gutter and Sidewalk

For purposes of measurement and payment, the combined curb, gutter and sidewalk will be considered as two component sections.

The first component, sidewalk, shall comprise that portion of the combined section beginning 6 inches behind the face of curb and shall be measured on a square yard basis for the actual square yards of sidewalk constructed.

The second component, curb and gutter, shall comprise the portion of the combined section beginning at the back of curb and through the gutter section, and shall be measured on a linear foot basis for the actual linear feet of curb and gutter constructed.

507.04.01D Precast Concrete Curb

Precast concrete curb will be measured on a linear foot basis along the face of the curb constructed, or on a per each basis for the actual number of precast concrete curb sections constructed.

507.04.01E Concrete Valley Gutter

Concrete valley gutter will be measured on a linear foot basis for the actual linear feet of gutter constructed.

507.04.01F Traffic Islands

Traffic islands will be measured by component parts of curb, and sidewalks as described above for combined curb, gutter and sidewalk.

507.04.01G Driveways, Sidewalks and Pathways

Measurement of portland cement or asphalt concrete driveways, sidewalks or pathways will be made on a square yard basis on the actual surface of the specified thickness concrete or asphalt completed and accepted.

507.04.01H Sawed Joints

Sawed joints will be measured on a linear foot basis for each joint sawed, cleaned, and sealed as specified and directed.

507.04.01I Aggregate Base

Pay quantities of aggregate base material will be measured as set forth in Section 503 AGGREGATE BASES.

507.04.02Payment

Payment will be made for any or all of the following items when listed as pay items in the Proposal for any particular contract and will include full compensation for all labor, materials, and equipment:

	Payment Item	Unit of Measure
1.	Curb (specify asphalt or concrete)	Per L.F.
2.	Precast Concrete Curb	Per L.F. or EA.
3.	Concrete Curb and Gutter	Per L.F.
4.	Sidewalk	Per S.Y.
5.	Concrete Valley Gutter	Per L.F.
6.	Driveways and Sidewalks (specify thickness)	Per S.Y.
7.	Sawed Joints	Per L.F.*
8.	Aggregate Base	Per C.Y.*

*When neither specified or shown in the Proposal for separate payment, it shall be considered incidental to the other items of work and no separate payment will be made.

****

508 GEOTEXTILE FABRICS

****

508.01 GENERAL

This work consists of furnishing and placing geotextile fabrics on subgrades (subgrade geotextile) and beneath an asphalt overlay (pavement overlay geotextile) as shown on the plans or as directed by the Engineer.

508.02 MATERIALS

Geotextile materials shall conform to Subsection 206.02.14.

508.03 CONSTRUCTION

508.03.01 General

General requirements for placement of geotextile shall be in accordance with Subsection 206.03.01.

508.03.02 Subgrade Geotextile

For roadbed subgrade separation, prepare the subgrade according to Section 501.

Correct geotextile failures, as evidenced by soil pumping or roadbed distortion, by removing any covering material in the affected area and placing a geotextile patch on the exposed geotextile. Cover the patch with the specified cover material and compact before proceeding.

508.03.03 Pavement Overlay Geotextile

(a) GENERAL - Place geotextile and pavement overlay in four basic steps:

- Surface preparation
- Sealant application
- Geotextile placement
- Overlay placement

(b) WEATHER LIMITATIONS - Do not place sealant and geotextile unless the weather limitations of section 505.03.11 or 506.03.07 are met, as appropriate, except the minimum air temperature shall be 50°F for paving grade asphalt sealant placement and 60°F for asphalt emulsion sealant placement.

(c) SURFACE PREPARATION - Prepare the pavement surface on which the sealant is to be placed according to specifications and the following:

- Clean and fill cracks exceeding 1/8 inch width with an approved bituminous crack filler.
- Repair minor irregularities or depressions as directed.
- Allow crack filling material to cure before placing geotextile.
- Where the pavement is severely cracked, rutted, deformed, or otherwise distressed, place a leveling course as directed instead of extensive surface preparation

(d) SEALANT APPLICATION - Use a normal paving grade asphalt. A cationic or anionic emulsion may be used as approved. Do not use cutbacks or emulsions which contain solvents.

Uniformly spray the asphalt sealant at normal application temperature by means of a pressure distributor on the prepared dry pavement surface. Apply at the normal rate of 0.20 to 0.30 gallon per square yard or as recommended by the geotextile manufacturer as directed.

If using emulsions, increase the application rate 50% or as directed. Some underlying surfaces may require a higher application rate. Within street intersections, on steep grades, or in other zones where vehicle speed changes are commonplace, reduce the normal application rate by 20% or as directed.

The target width of sealant application shall be geotextile width plus 6 inches. Apply the sealant only as far in advance of geotextile installation as appropriate to insure a tacky surface at the time of geotextile placement. Place geotextile the same day as the sealant. Do not allow traffic on the sealant. Clean excess asphalt from the road surface.

(e) GEOTEXTILE PLACEMENT - Place the geotextile into the sealant using mechanical or manual laydown equipment capable of providing a smooth installation with a minimum amount of wrinkling or folding before the sealant loses tackiness. When asphalt emulsions are used, allow the asphalt to separate from the water (break) before placing the geotextile.

Slit wrinkles or folds exceeding 1 inch and lay flat. Shingle-lap not more than 6 inches in the direction of the paving. Broom and/or pneumatic roll to maximize geotextile contact with the pavement surface. Additional hand-placed sealant material may be required at laps as determined.

Limit traffic to necessary construction equipment and emergency vehicles on the geotextile before and during paving unless otherwise directed. Turn the paver and other vehicles gradually. Keep turning to a minimum to avoid geotextile movement and damage. Avoid abrupt starts and stops.

(f) OVERLAY PLACEMENT - Place the overlay the same day the geotextile is placed. Remove sealant that bleeds through the geotextile. Do not windrow asphalt concrete material on the geotextile ahead of the paving machines. Do not use an asphalt concrete material pickup machine. In the event of rain, the Contractor shall place sand over uncovered fabric to absorb sealant.

508.04 MEASUREMENT AND PAYMENT

Payment for the work in this section shall be in accordance with Subsection 206.04 by the square yard in place. Measurement will be to the nearest square yard. No allowance will be made for material in laps and seams. This payment shall constitute full compensation for all materials and work as specified within.

****

509 COLD PLANE PAVEMENT REMOVAL

****

509.01 GENERAL

This work shall consist of preparing a foundation for placement of new surfacing by removal of existing surfacing to the depth, width, and cross section shown on the plans.

509.02 WORKMANSHIP

509.02.01 Equipment

The existing surfacing shall be removed with a self-propelled planning machine or grinder. The equipment shall be capable of accurately establishing profile grades within a tolerance of 0.02 foot by reference from either the existing pavement or from independent grade control and shall have a positive means for controlling cross slope elevations. The equipment shall incorporate a totally enclosed cutting drum with replaceable cutting teeth and shall have an effective means for removing excess material from the surface and for preventing dust from escaping into the air. The use of a heating device to soften the pavement will not be permitted.

509.02.02 Pavement Removal

The existing pavement shall be removed to the depth, width, grade, and cross section shown on the plans or as directed by the Engineer to provide a surface profile true to specified grade and transverse slope.

Except where samples are taken to establish a job mix formula, the existing surfacing shall not be removed more than five days prior to construction of the new surfacing, unless otherwise approved by the Engineer.

Wherever samples are obtained from existing surfacing more than five days prior to construction of the new surfacing, the Contractor shall patch the samples areas with asphalt concrete at his own expense.

509.02.03 Surface Tolerance

The new surface resulting from the pavement removal will be tested by the Engineer for trueness to specified grade and transverse slope at selected locations. Testing will be with a 10-foot straightedge. The variation of the surface from the testing edge of the straightedge between any two contact points shall not exceed 0.02 foot.

509.02.04 Disposal of Materials

Materials removed under this specification which are not recycled and used on the project shall become the property of the Contractor at the point of removal and shall be disposed of off the limits of the project in a manner satisfactory to the Engineer. Contractor shall provide disposal site for approval.

The Contractor is encouraged to salvage any removed cold planed materials which are not recycled and used on the project for use on future projects.

509.03 MEASUREMENT AND PAYMENT

Materials removed under this specification, regardless of thickness, will be measured for payment on a square yard basis. The pay quantities will be determined by measurement of the actual surface of the area from which the materials have been removed and computed to the nearest 0.1 square yard.

****

510 ADJUSTMENT OF EXISTING STRUCTURES TO GRADE

****

510.01 DESCRIPTION

This section covers the work necessary for adjusting tops of existing structures (e.g., manholes, sumps, catch basins, inlets, valve boxes, meter boxes, monument boxes, and similar structures) to required elevation and/or horizontal alignment complete. See Subsection 302.03.06 for adjustment of new structures to grade.

510.02 MATERIALS

510.02.01 GENERAL

Materials used in adjustment of existing structures may be materials salvaged from the existing installation and brought to a condition approved for reuse by the Engineer.

510.03 CONSTRUCTION

510.03.01 Excavation and Backfill

Excavation shall be unclassified and shall include whatever materials are encountered to the depths as shown.

Saw cut around structures to be adjusted when pavement work has been completed. Do not use a jack hammer for pavement cutting. Replace pavement to previous density and grade. See Standard Detail Drawing No. 513.

Backfill shall be done in accordance with the applicable requirements of Section 205.

510.03.02 Salvage of Frames, Covers, and Grates

Metal frames, covers, grates, and fittings may be salvaged from structures to be adjusted or abandoned, and if of suitable size and condition, as determined by the Engineer, may be reused in the work.

Salvaged components to be reused shall be cleaned of foreign material by solvents, sand blasting, or other methods that will not harm the component but will restore it to a nearly new condition.

Salvaged frames, covers, and grates not reused on the project shall become the property of the Owner. The Contractor shall return them to Public Works Yard at no additional cost to the Owner.

510.03.03 Raising Tops of Masonry Structures

After existing frames, covers, and grates have been removed, expose the top surface on which new mortar or concrete is to be placed and chip away at least ¼ inch to expose firm concrete. The new surface shall be cleaned by brushing and shall be moistened with water at the time of placing new concrete. New concrete shall then be placed to required grade and cured at least three (3) days, after which the frame shall be seated in fresh mortar and brought to the proper grade.

Masonry of bricks or concrete blocks shall be raised with new bricks, blocks, mortar, or combinations thereof or with portland cement concrete, as conditions may require. Concrete boxes may be lifted and placed on precast concrete box extensions, on new brick, or on cast-in-place concrete as may be suitable.

Mortar for building up existing masonry shall not be placed to a depth exceeding one inch. Concrete shall not be placed to a depth of less than four (4) inches. To conform to these requirements, existing shells or walls of structures to be raised shall be cut down as necessary to provide space for new construction.

Fabricated metal rings or plates may be furnished and used in adjustment work, provided the metal and its fabrication design is at least equal to specified characteristics of strength and support required of the covers or grates to be placed, that uniform bearing of bearing surfaces is assured, and positive provision is afforded against displacement when in service.

510.03.04 Lowering Tops of Masonry Structures

Where the top of an existing masonry structure is to be lowered, the masonry portion of the structure shall be exposed to required depth, cut off, or removed to an elevation below that established for the bottom of metal frame or cover which is to be reset on masonry and shall then be built up with mortar, concrete, brick, or concrete blocks, or with metal rings or plates to required elevation and top design. Joining of new material to old, minimum thicknesses of new mortar and concrete, limitations, curing, and other details shall be as specified in Section 701.

510.03.05 Adjusting Metal Structures

Metal inlets, valve boxes, meter boxes, monument boxes, or other like structures shall be raised or lowered to grade normally by resetting the entire structure on firm foundation. In the case of raising the structure to a point where it would not enclose or protect its contents, add extensions of like design below the original structure. Contractor may replace the structure with a new structure of adequate design as approved and at the Contractor's sole expense. Salvaged structures not reused on the project shall become the property of the Owner. Metal structures shall meet the surface smoothness requirements of Section 210.03.04D. Conform to applicable Sections of DIVISION THREE - SANITARY SEWER TECHNICAL REQUIREMENTS and DIVISION FOUR - WATER TECHNICAL REQUIREMENTS.

510.04 MEASUREMENT AND PAYMENT

510.04.01 Measurement and Payment Incidental

When no pay item is listed in the Proposal, all work will be considered as incidental to the other pay items and no separate payment will be made.

510.04.02 Measurement as Units in Place

When listed in the Proposal, measurement will be the actual number of manholes, sumps, catch basins, inlets, valve boxes, meter boxes, monument boxes, and other like structures adjusted under this Section, measured as units in place, completed and accepted. Separate measurement will be made of each specific type or of each separate grouping of types of structures for which separate items are shown in the Proposal. Required earthwork, backfill, replacement of base drains, stone bases,

pavements, and other miscellaneous work will be considered as incidental to the adjusting work and no separate measurement thereof will be made.

510.04.03 Payment as Units in Place

When listed in the Proposal, the accepted units in place will be paid for at the applicable Contract unit price per each for the particular pay items listed below and shown in the Proposal.

	Pay Item	Unit of Measurement
1.	Adjusting Manholes	Each
2.	Reconstructing Concrete Manholes	Each
3.	Adjusting Inlets	Each
4.	Adjusting Boxes	Each

Items 1 and 2 above refer to manholes, sumps, and like structures designed to permit human entry and working space therein, and to confine and control the flow of pipe-conveyed liquids; which structures are herein collectively referred to as manholes.

Item 1 above applies to manholes, regardless of the kind of materials of which they are composed and regardless of design, type, or depth, which have had the tops thereof adjusted as specified; except as Item 2 is applicable as hereinafter provided.

Item 2 above refers to monolithic concrete manholes which, in having their tops adjusted as specified, have necessarily had their entire existing cones destroyed and new cones constructed, or had their entire existing top slabs destroyed and new slabs constructed, or precast manholes which have necessarily had adjustments made below the cone.

Item 3 above refers to inlets and catch basins, defined as structures designed to receive surface water through grates and orifices and to discharge said waters under control through pipes and is applicable to such structures regardless of their designs, types, or sizes.

Item 4 refers to valve boxes, meter boxes, monument boxes, and other like structures, which are comprised of a box-like body and removable cover provided for the protection of and access to meters, valves, markers, monuments, shut-offs, and similar items. If a protective coating is required on the new metal used in the work, the coating shall be provided as an incidental item without separate or additional compensation.

****

511 PAVEMENT MARKINGS AND TRAFFIC SIGNING

****

511.01 DESCRIPTION

This section covers the work necessary for furnishing and installing pavement markings and traffic signing that meets the City standard street and sign drawings and the latest edition of The Manual on Uniform Traffic Control Devices with Oregon Supplement.

511.02 MATERIALS

511.02.01 PAVEMENT MARKINGS

All pavement markings shall be approved by the Owner prior to application. Pavement striping that is specified thermoplastic non-skid marking shall conform to Section 02840 of the ODOT Standard Specifications for Highway Construction.

511.02.02 TRAFFIC SIGNING

All traffic signing shall be approved by the Owner prior to application. All signs shall meet the latest retroreflective requirement with high intensity prismatic grade sheeting.

511.03 CONSTRUCTION

Meet with the Owner at least two working days but no more than five working days prior to stripping or signing work.

511.03.01 PAVEMENT MARKINGS

Pavement surfaces shall be clean and dry prior to striping. Remove all debris on pavement and clean all pavement surfaces. Striping shall be performed under the same temperature requirement for paving, to allow proper drying and curing of the pavement marking material. Grinding shall be provided to remove spillage of marking material on new pavement at no cost to the Owner.

511.03.02 TRAFFIC SIGNING

Existing signs shall be protected during removal and temporary storage so no damage occurs to the signs. Coordinate all sign placement with Newberg Public Works Maintenance Superintendent, 500 W. Third Street, Newberg, OR 97132 Tel: 503.537.1233. All efforts should be made to reuse existing sign posts, where noted in the construction drawings. New posts that are not called out in drawings are considered incidental work.

511.04 MEASUREMENT AND PAYMENT

511.04.01 PAVEMENT MARKINGS

Payment shall be made on a lump sum basis.

511.04.02 TRAFFIC SIGNING

When not listed in the Proposal for separate payment, all sign relocation will be made on a lump sum basis as part of Restoration and Cleanup. Payment for all new signs will be made on a lump sum basis unless itemized on a per each basis.

****

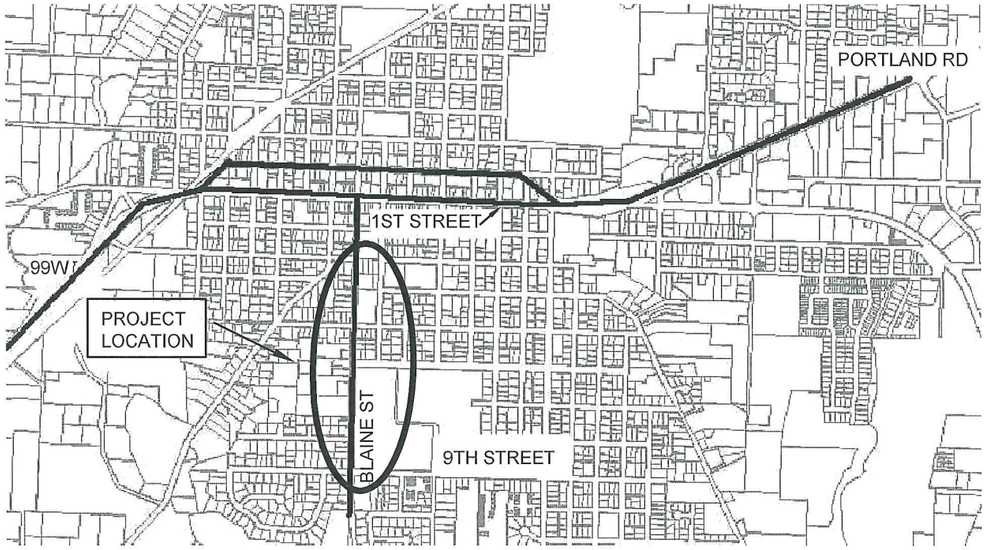
END OF DIVISION

PART 5

CONSTRUCTION DRAWINGS AND APPLICABLE STANDARD DETAILS

ADA SIDEWALK IMPROVEMENTS

ON BLAINE STREET



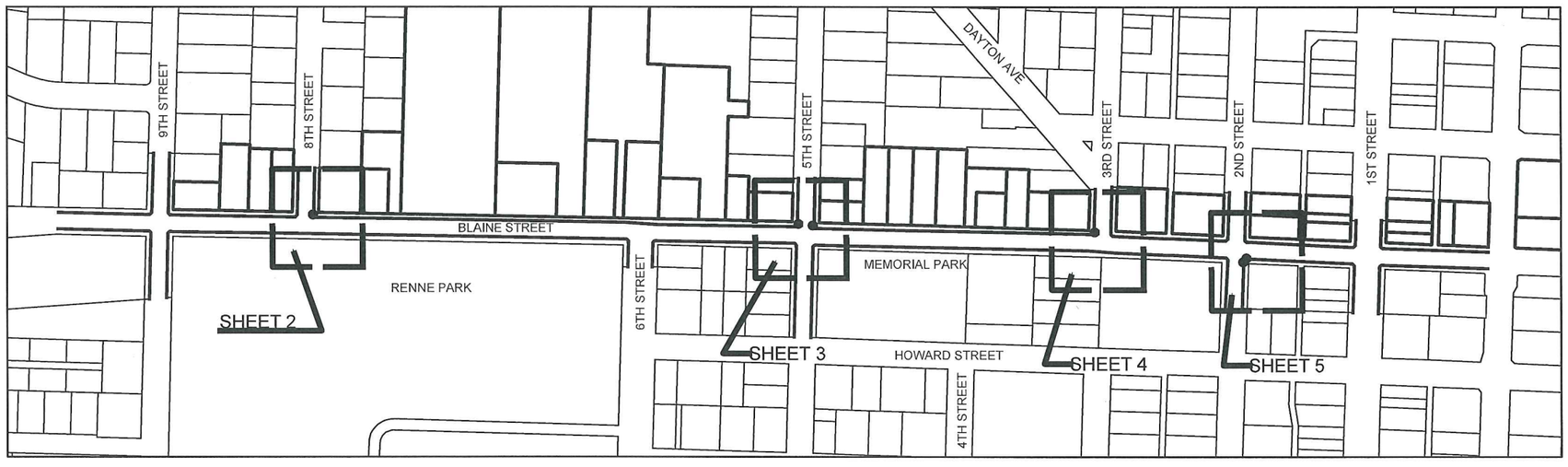
VICINITY MAP

N.T.S.

GENERAL NOTES:

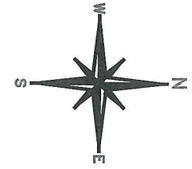
1. FOLLOW CITY OF NEWBERG STANDARD DRAWINGS, IN PARTICULAR, SIDEWALK RAMPS, CURBS AND SIDEWALKS.
2. MAXIMUM SLOPE FOR RAMPS IS 1:12. RAMP LANDINGS MUST BE LEVELED.
3. RUBBERIZED ASPHALT EMULSION (HOT) SHALL BE USED TO SEAL ALL NEW JOINTS BETWEEN CONCRETE AND ASPHALT.
4. NO UTILITY POLES OR STREET SIGNS ARE PROPOSED FOR RELOCATION.
5. MEASUREMENTS ARE APPROXIMATE, CONTRACTOR TO VERIFY.
6. STREET CENTERLINES ARE APPROXIMATED USING GIS.
7. DEBRIS REMOVAL AND OFFSITE DISPOSAL OF DEMOLITION MATERIALS TO BE COMPLETED BY CONTRACTOR.

SHEET INDEX:	
SHEET 1	COVER SHEET
SHEET 2	8TH STREET PLAN
SHEET 3	5TH STREET PLAN
SHEET 4	3RD STREET PLAN
SHEET 5	2ND STREET PLAN
SHEET 6	CONSTRUCTION DETAILS
SHEET 7	STANDARD DRAWINGS
SHEET 8	STANDARD DRAWINGS



SHEET LAYOUT FOR BLAINE STREET

N.T.S.



City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

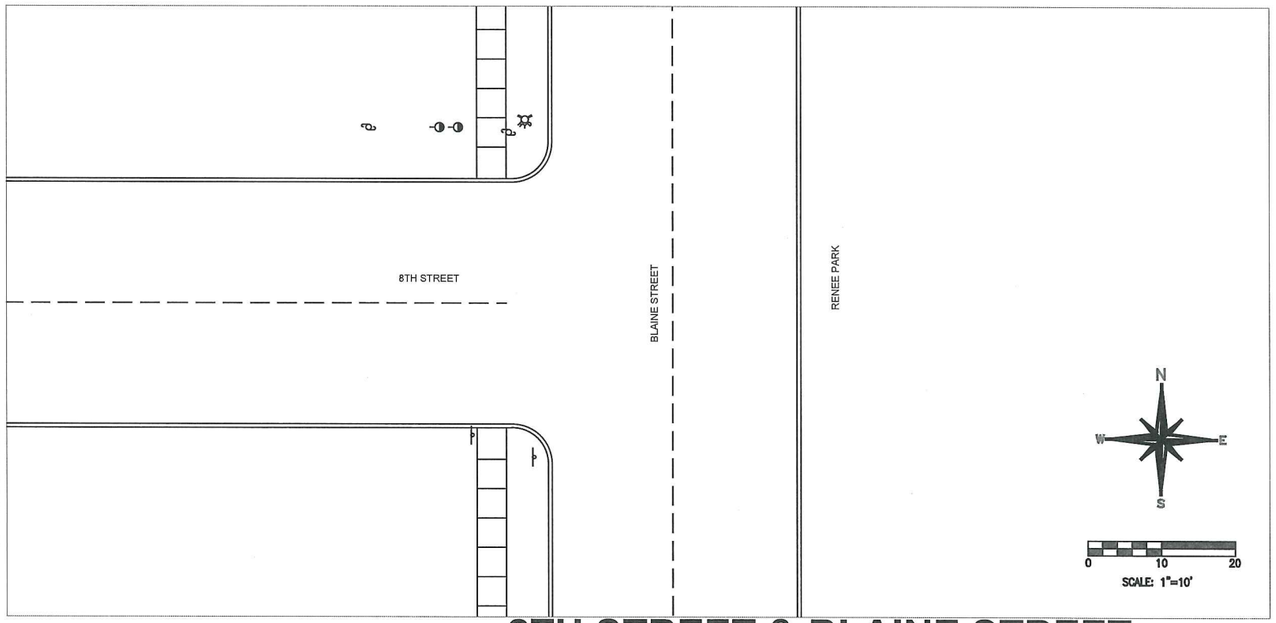
REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 10, 1979 — PAUL C. CHIU — EXP: 12/31/15

SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

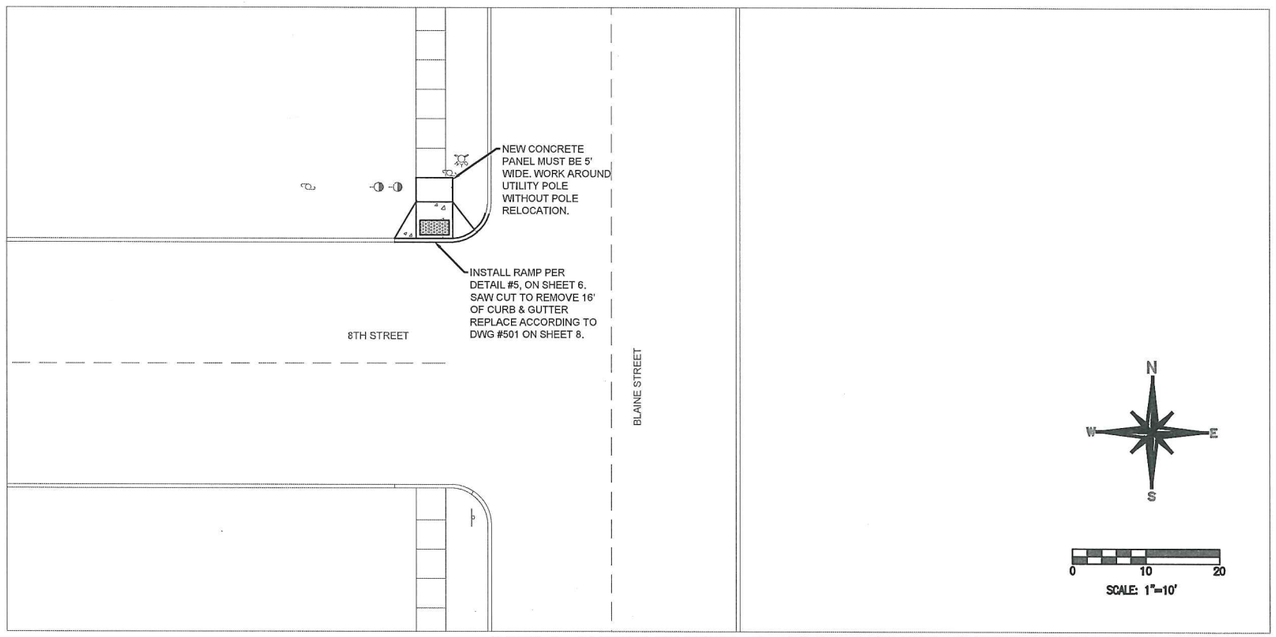
ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET

COVER SHEET

SHEET 1 OF 8



8TH STREET & BLAINE STREET
EXISTING CONDITIONS



8TH STREET & BLAINE STREET
PROPOSED IMPROVEMENTS

LEGEND

- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- EXISTING FIRE HYDRANT
- EXISTING GUY WIRE
- EXISTING CONCRETE SIDEWALK

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

REGISTERED PROFESSIONAL ENGINEER — OREGON — PAUL C. CHIU — EXP: 12/31/15

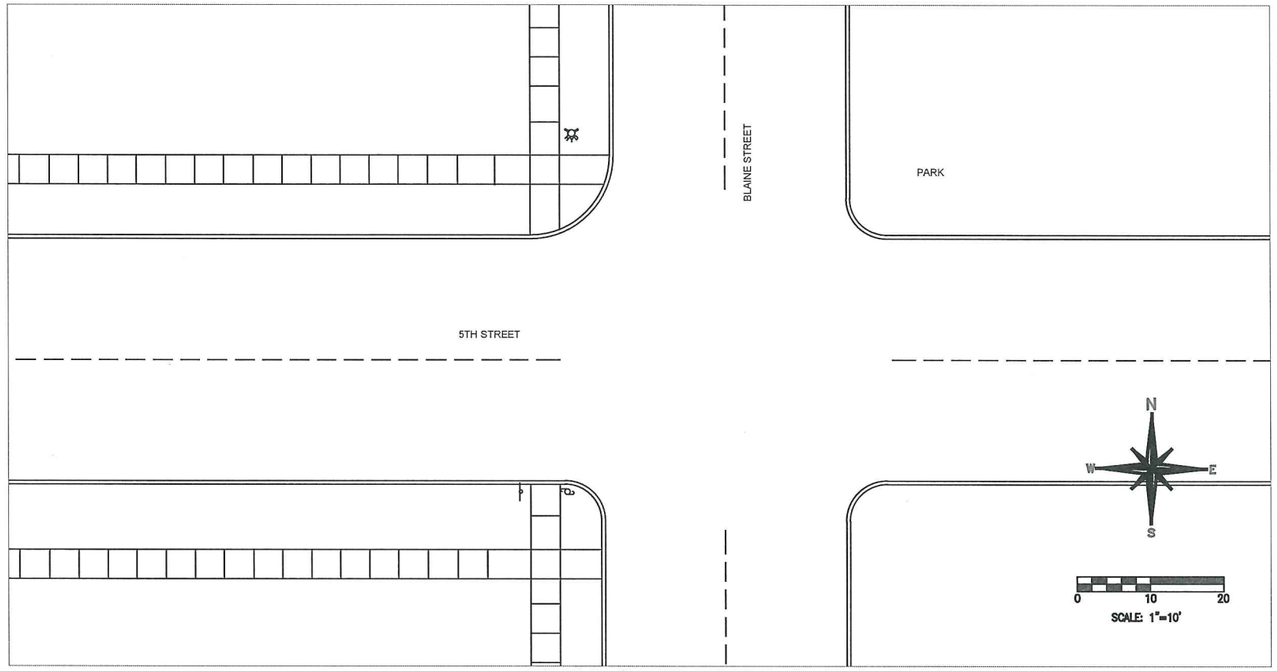
SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET

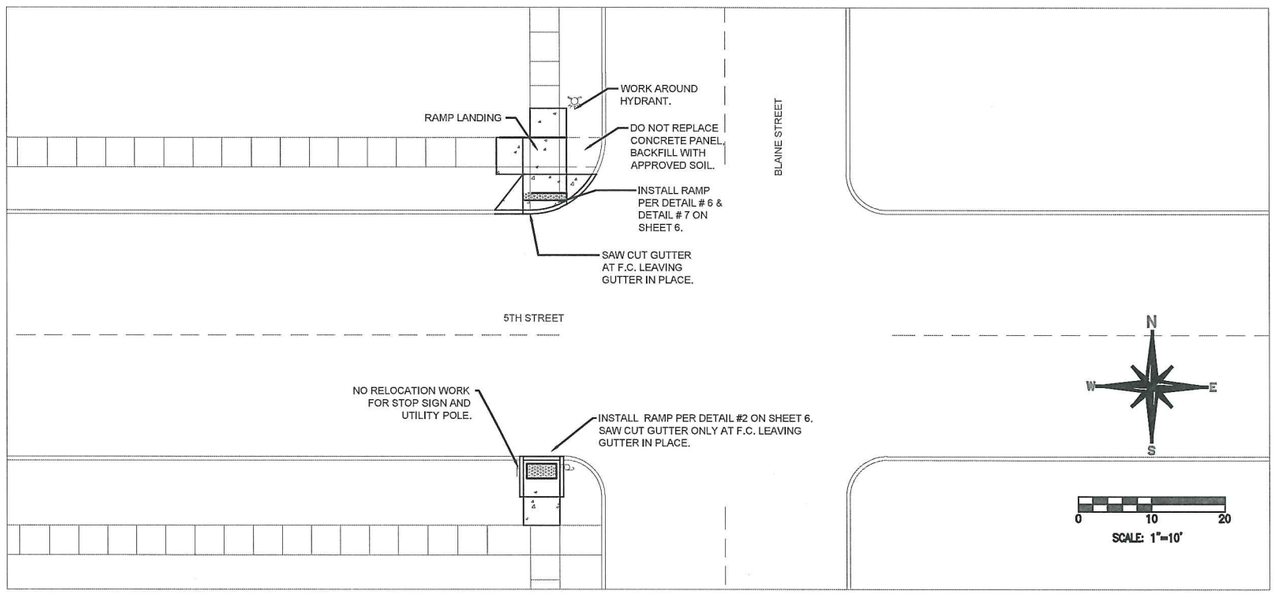
8TH STREET PLAN

SHEET

2 OF 8



5TH STREET & BLAINE STREET
EXISTING CONDITIONS



5TH STREET & BLAINE STREET
PROPOSED IMPROVEMENTS

LEGEND

- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- EXISTING FIRE HYDRANT
- EXISTING GUY WIRE
- EXISTING CONCRETE SIDEWALK

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

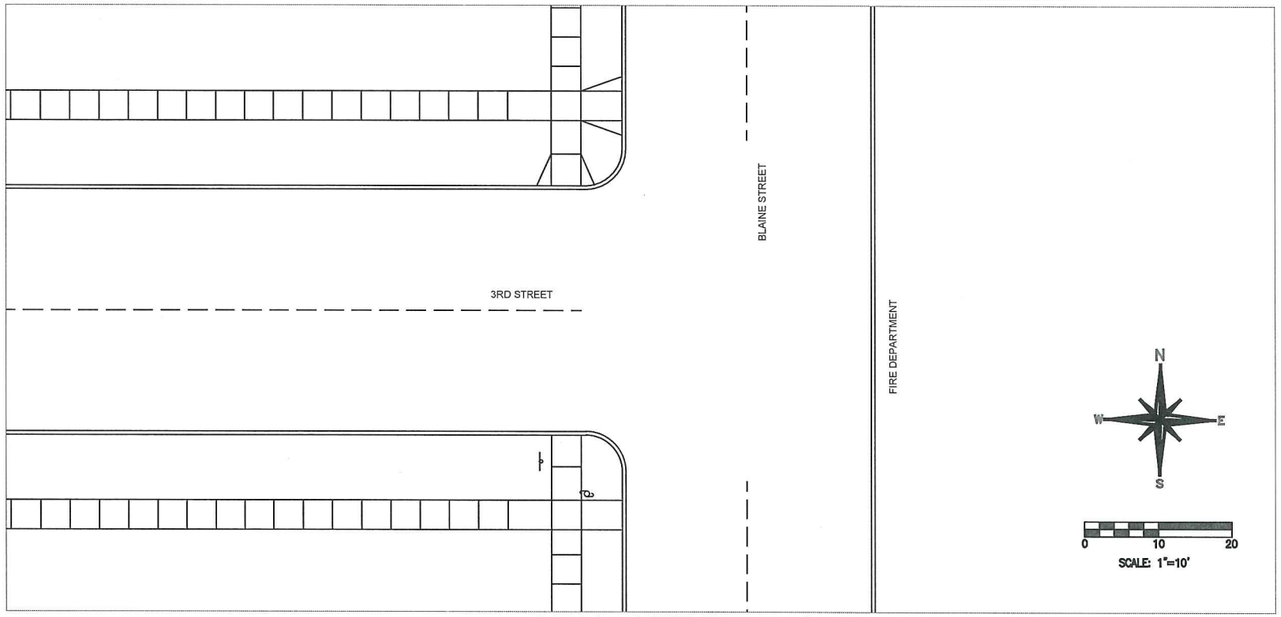
REGISTERED PROFESSIONAL ENGINEER — OREGON — PAUL C. CHIU — EXP: 12/31/13

SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

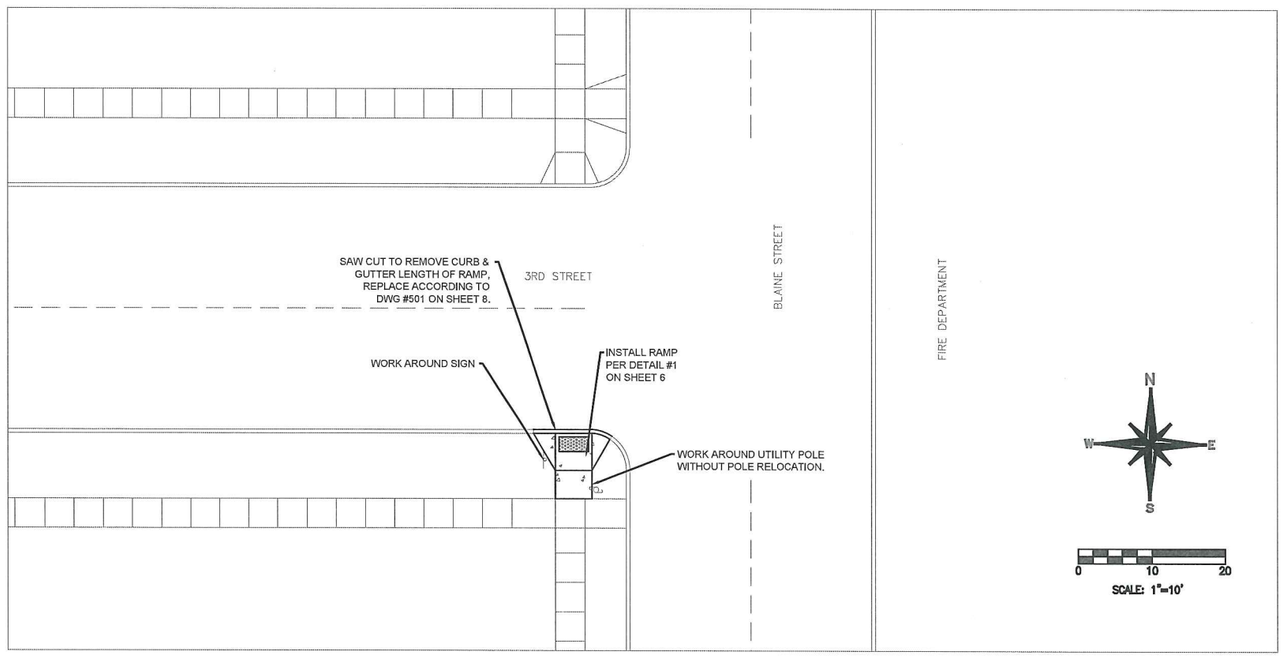
ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET

5TH STREET PLAN

SHEET



3RD STREET & BLAINE STREET
EXISTING CONDITIONS



3RD STREET & BLAINE STREET
PROPOSED IMPROVEMENTS

LEGEND

- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- EXISTING FIRE HYDRANT
- EXISTING GUY WIRE
- EXISTING CONCRETE SIDEWALK

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

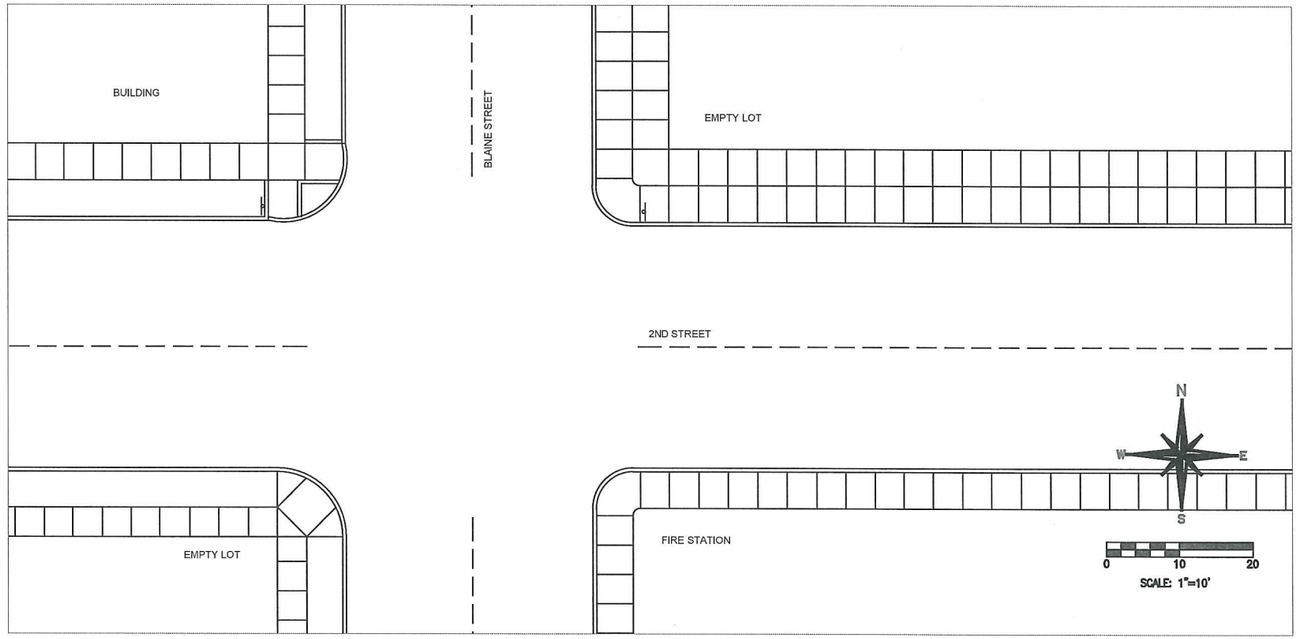
Rev.	Description	Date	By

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 18, 2008
PAUL C. CHIU
EXP: 12/31/15

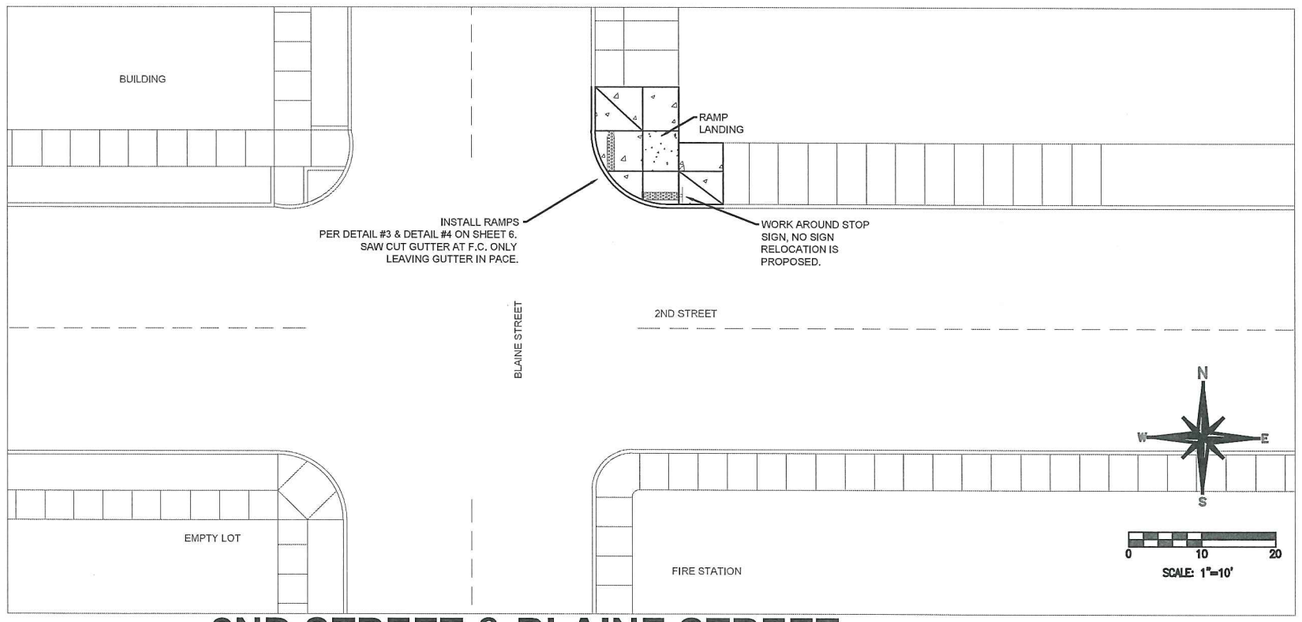
SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

ADA SIDEWALK IMPROVEMENTS
ON BLAINE STREET
3RD STREET PLAN

SHEET
4 OF 8



2ND STREET & BLAINE STREET
EXISTING CONDITIONS



2ND STREET & BLAINE STREET
PROPOSED IMPROVEMENTS

LEGEND

- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- EXISTING FIRE HYDRANT
- EXISTING GUY WIRE
- EXISTING CONCRETE SIDEWALK

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

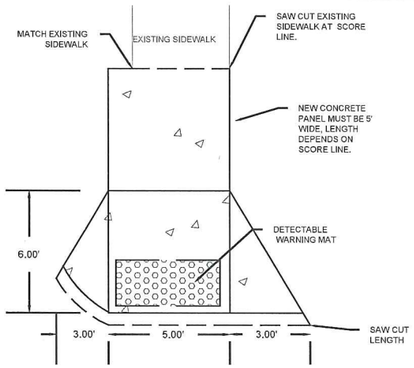
Rev.	Description	Date	By

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 19, 1991
PAUL C. CHIU
EXP: 12/31/13

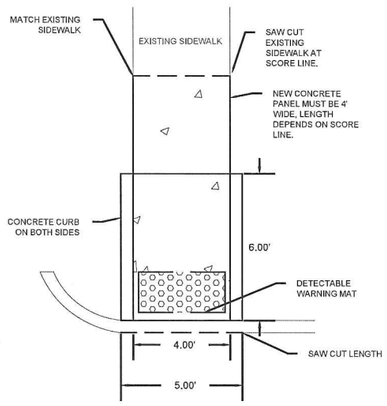
SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET
2ND STREET PLAN

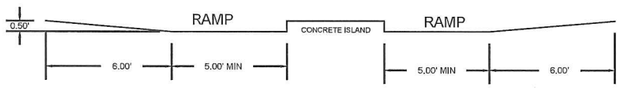
SHEET
5 OF 8



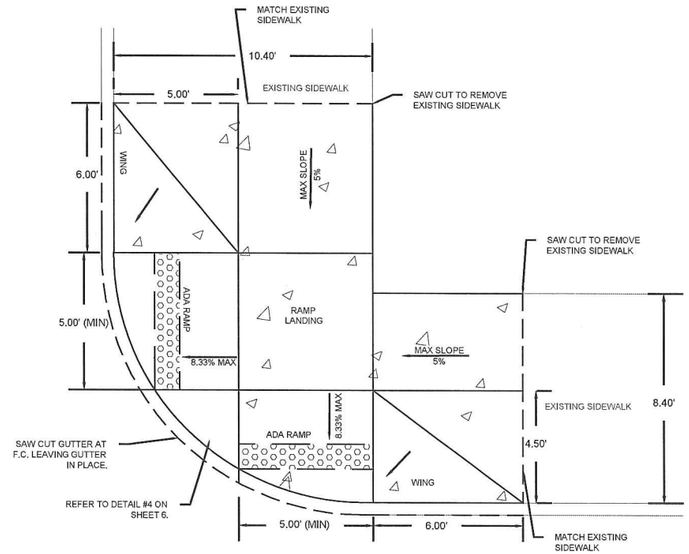
DETAIL #1
N.T.S.



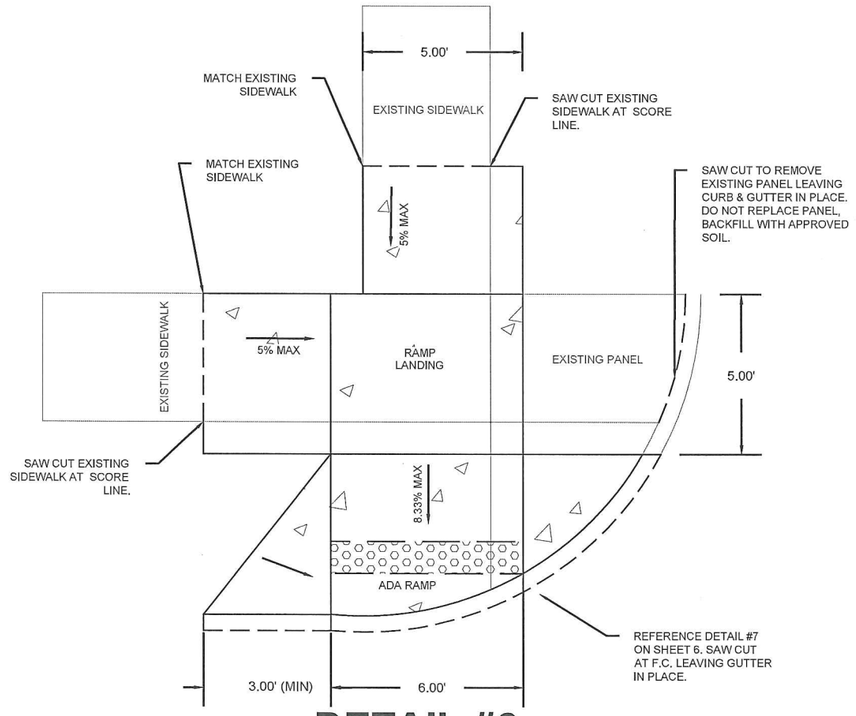
DETAIL #2
N.T.S.



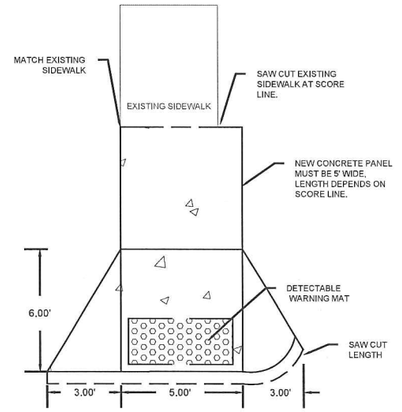
DETAIL #4
N.T.S



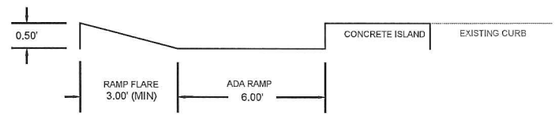
DETAIL #3
N.T.S



DETAIL #6
N.T.S



DETAIL #5
N.T.S.



DETAIL #7
N.T.S

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 18, 2008 — PAUL C. CHIU — EXP: 12/31/15

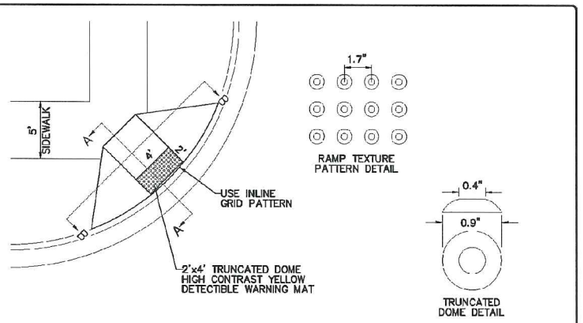
SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET

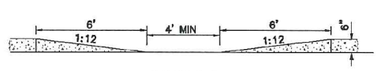
CONSTRUCTION DETAILS

SHEET

6 OF 8



SECTION A–A



SECTION B–B

NOTES:

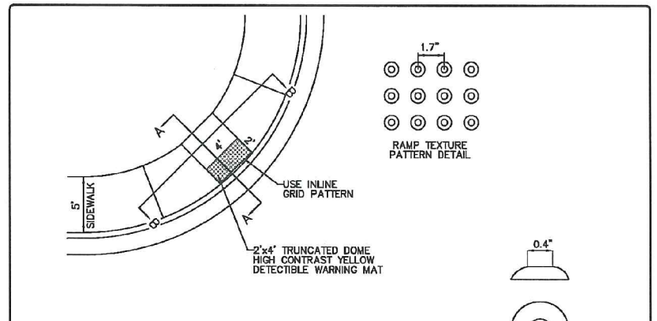
1. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
2. SIDEWALK RAMPS ARE REQUIRED AT ALL NEW INTERSECTIONS.
3. REPLACEMENT CURBS MUST BE POURED AGAINST A VERTICAL EDGE OF EXISTING CURB.
4. CONCRETE IN A REPLACEMENT CURB SHALL NOT PROTRUDE PAST THE FACE OF THE CURB IN THE ASPHALT REPLACEMENT AREA.
5. HORIZONTAL AND VERTICAL ALIGNMENT SHALL BE WITHIN 1/8" IN 10'.
6. DETECTIBLE SURFACE SHALL BE CONSTRUCTED WITH PREFABRICATED UNITS. TEXTURE SHALL NOT BE WET IMPRINTED. TRUCNACTED DOME PATTERN SHALL BE INLINE, ALIGNED IN THE DIRECTION OF THE RAMP.
7. DETECTIBLE SURFACE SHALL BE YELLOW (FEDERAL COLOR #33538).
8. THIS DETAIL IS APPROVED FOR USE IN THE PUBLIC RIGHT OF WAY ONLY.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

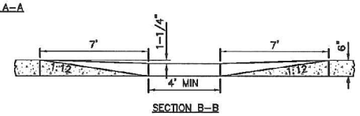
REVISIONS	
04/06/10	

SIDEWALK RAMP
TYPE "A" SIDEWALK

SCALE:	N.T.S.
DATE:	May 2007
APPROVED BY:	D. Danicic
STANDARD DRAWING	506



SECTION A–A



SECTION B–B

NOTES:

1. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
2. SIDEWALK RAMPS ARE REQUIRED AT ALL NEW INTERSECTIONS.
3. REPLACEMENT CURBS MUST BE POURED AGAINST A VERTICAL EDGE OF EXISTING CURB.
4. CONCRETE IN A REPLACEMENT CURB SHALL NOT PROTRUDE PAST THE FACE OF THE CURB IN THE ASPHALT REPLACEMENT AREA.
5. HORIZONTAL AND VERTICAL ALIGNMENT SHALL BE WITHIN 1/8" IN 10'.
6. DETECTIBLE SURFACE SHALL BE CONSTRUCTED WITH PREFABRICATED UNITS. TEXTURE SHALL NOT BE WET IMPRINTED. TRUCNACTED DOME PATTERN SHALL BE INLINE, ALIGNED IN THE DIRECTION OF THE RAMP.
7. DETECTIBLE SURFACE SHALL BE YELLOW (FEDERAL COLOR #33538).
8. THIS DETAIL IS APPROVED FOR USE IN THE PUBLIC RIGHT OF WAY ONLY.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS	
04/06/2010	

SIDEWALK RAMP
TYPE "B" SIDEWALK

SCALE:	N.T.S.
DATE:	May 2007
APPROVED BY:	D. Danicic
STANDARD DRAWING	507

Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

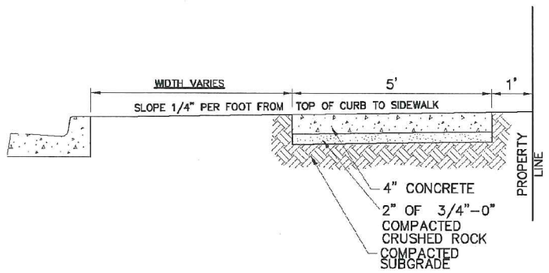
REGISTERED PROFESSIONAL ENGINEER — OREGON — NOV. 19, 1974 — PAUL C. CHIU — EXP: 12/31/13

SCALE:	AS SHOWN
DATE:	05-27-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	PAUL CHIU

ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET
STANDARD DRAWINGS

SHEET

7 OF 8



NOTES:

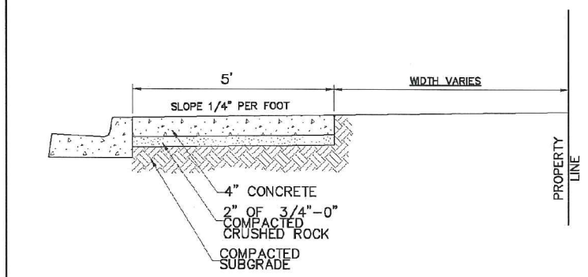
1. SLOPE FROM THE PROPERTY LINE TO THE STREET AT 2%.
2. WORK AGGREGATE INTO CONCRETE PRIOR TO FINISHING CONCRETE.
3. FINISHING DETAILS
   - -EDGE CONCRETE WITH 3" EDGING TROWEL.
   - -SCORE CONCRETE AT 5' INTERVALS.
   - -INSTALL 1/8" X 1 1/2" CONTRACTION JOINTS EVERY 15'.
   - -FABRIC TYPE EXPANSION JOINT NOT TO BE USED
   - -APPLY LIGHT BROOM FINISH TRANSVERSE TO THE SIDEWALK.
4. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
5. APPLY CURING COMPOUND (PETROLEUM BASE) TO FRESH CONCRETE TO RETAIN MOISTURE.
6. TOLERANCES
   - -SURFACE SHALL NOT VARY MORE THAN 1/4" FROM A 10' STRAIGHT EDGE.
   - -ALIGNMENT SHALL BE WITHIN 1/4" OF TRUE LINE.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

SIDEWALK TYPE "A"

SCALE: N.T.S.
DATE: Jan. 2010
APPROVED BY: P. Chiu
STANDARD DRAWING 503



NOTES:

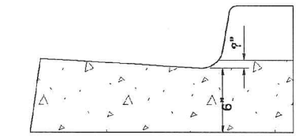
1. SLOPE FROM THE PROPERTY LINE TO THE STREET AT 2%.
2. WORK AGGREGATE INTO CONCRETE PRIOR TO FINISHING CONCRETE.
3. FINISHING DETAILS.
   - -EDGE CONCRETE WITH 3" EDGING TROWEL.
   - -SCORE CONCRETE AT 5' INTERVALS.
   - -INSTALL 1/8"x1 1/2" CONTRACTION JOINTS EVERY 15'.
   - -FABRIC TYPE EXPANSION JOINT NOT TO BE USED.
   - -APPLY LIGHT BROOM FINISH TRANSVERSE TO THE SIDEWALK
4. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
5. APPLY CURING COMPOUND (PETROLEUM BASE) TO FRESH CONCRETE TO RETAIN MOISTURE.
6. TOLERANCES
   - -SURFACE SHALL NOT VARY MORE THAN 1/4" FROM A 10' STRAIGHT EDGE.
   - -ALIGNMENT SHALL BE WITHIN 1/4" OF TRUE LINE.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

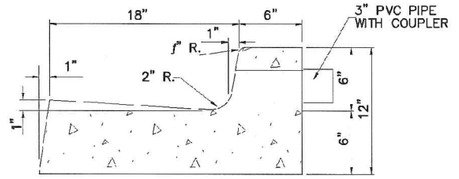
REVISIONS:

SIDEWALK TYPE "B"

SCALE: N.T.S.
DATE: Jan. 2010
APPROVED BY: P. Chiu
STANDARD DRAWING 504



CURB AND GUTTER AT DRIVEWAY APPROACH



CURB AND GUTTER

NOTES

1. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
2. TRANSVERSE CONTRACTION JOINTS – MAKE 1/8" X 1 1/2" DEEP CUT; SPACED AT 15', PROVIDE CONTRACTION JOINTS AT CURB RETURN POINTS, CATCH BASINS AND DRIVEWAYS.
3. SCORE CURB OVER WEEP HOLE BLOCK OUT.
4. EXPANSION JOINTS SHALL NOT BE USED.
5. APPLY CURING COMPOUND (PETROLEUM BASED) TO FRESH CONCRETE TO RETAIN MOISTURE.
6. TOP OF CURB BRANDED WITH "S" OR "W", 2" MIN. HEIGHT FOR SEWER AND WATER LOCATIONS. HAND SCRIBING NOT ALLOWED.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

CURB AND GUTTER

SCALE: N.T.S.
DATE: May 2007
APPROVED BY: D. Danicic
STANDARD DRAWING 501

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	Description	Date	By

REGISTERED PROFESSIONAL ENGINEER — OREGON — PAUL C. CHIU — EXP: 12/31/13

SCALE: AS SHOWN
DATE: 05-27-2014
DRAWN: GR
DESIGNED: GR
APPROVED: PAUL CHIU

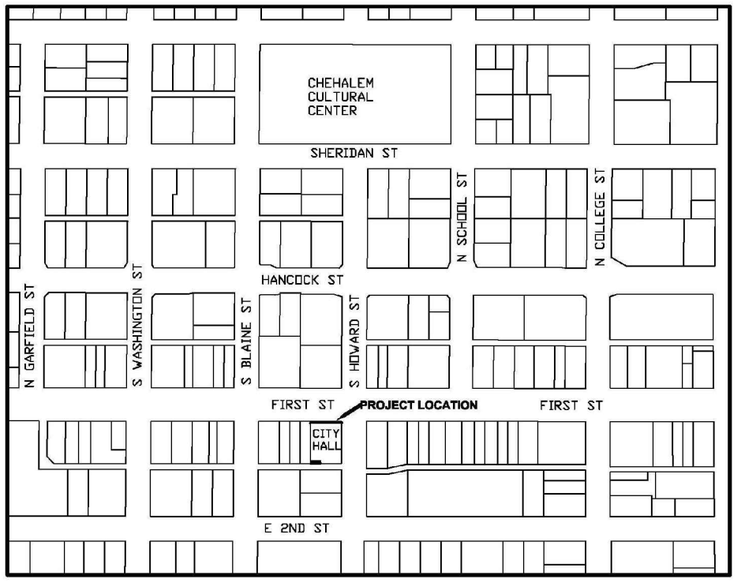
ADA SIDEWALK IMPROVEMENTS ON BLAINE STREET

STANDARD DRAWINGS

SHEET

8 OF 8

CITY HALL FRONTAGE IMPROVEMENTS



SITE MAP
N.T.S.

GENERAL NOTES:

1. MEASUREMENTS ARE APPROXIMATE, CONTRACTOR TO VERIFY.
2. FOLLOW SCORING PATTERN AS SHOWN ON PROPOSED IMPROVEMENT PLAN (SHEET 4).
3. CITY WILL PROVIDE NEW BIKE RACK(S) FOR CONTRACTOR TO INSTALL.
4. ALL TREES SHALL BE 3 INCHES IN CALIPER AND TO INCLUDE A WATERING BAG.
5. WORK AROUND ODOT TRAFFIC SIGNAL POLE, NO POLE RELOCATION.
6. DEBRIS REMOVAL & OFFSITE DISPOSAL OF DEMOLITION MATERIALS TO BE COMPLETED BY CONTRACTOR.
7. CONTRACTOR TO MAINTAIN SAFE AND ADEQUATE PEDESTRIAN ACCESS THROUGH THE AREA AND TO CITY HALL AT ALL TIMES.

SHEET INDEX

CITY OF Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

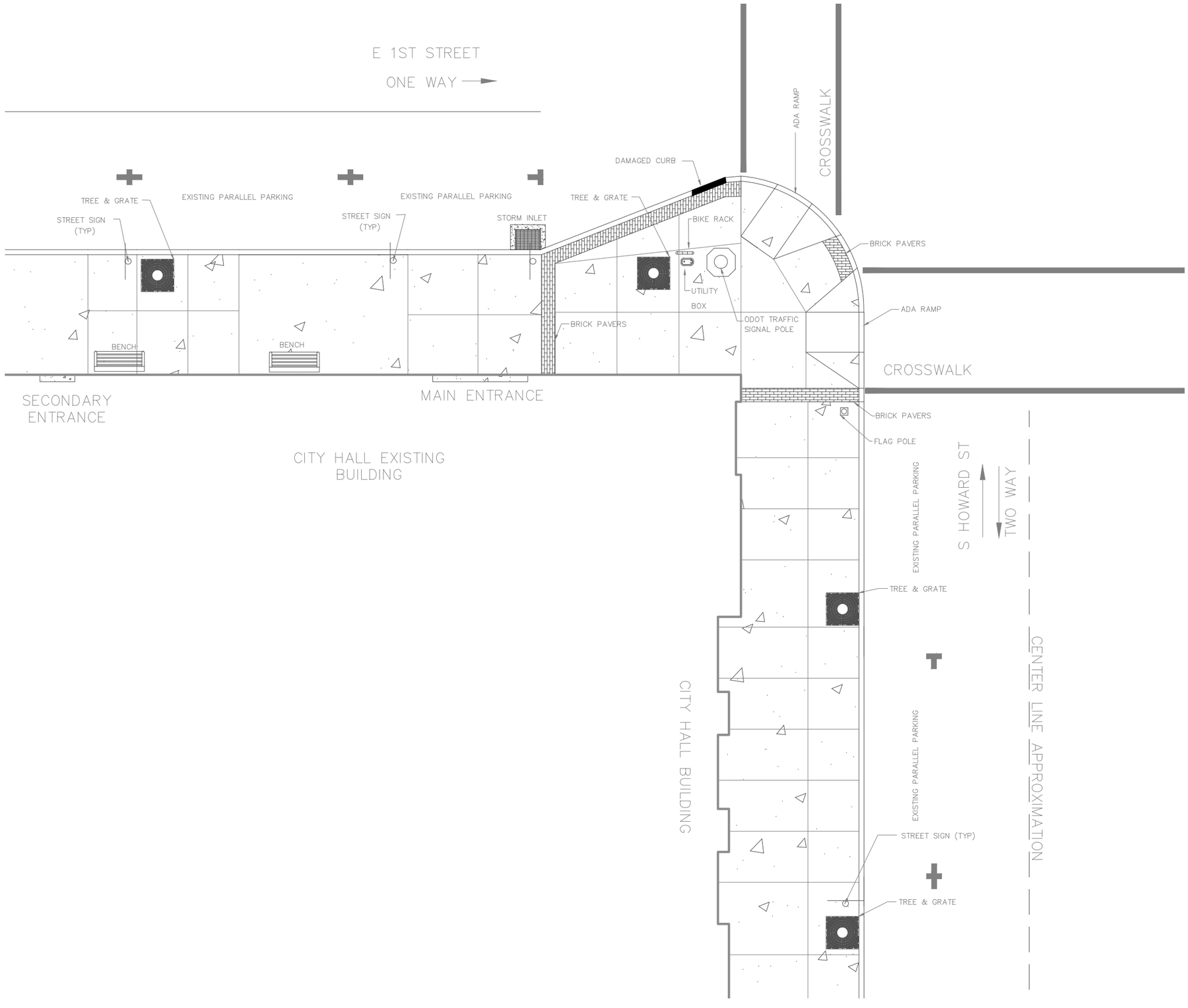
By | Rev.

SCALE:	DATE:	DRAWN:	DESIGNED:	APPROVED:
AS SHOWN	05-30-2014	GR	GR	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

COVER SHEET

SHEET
1 OF 10



City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

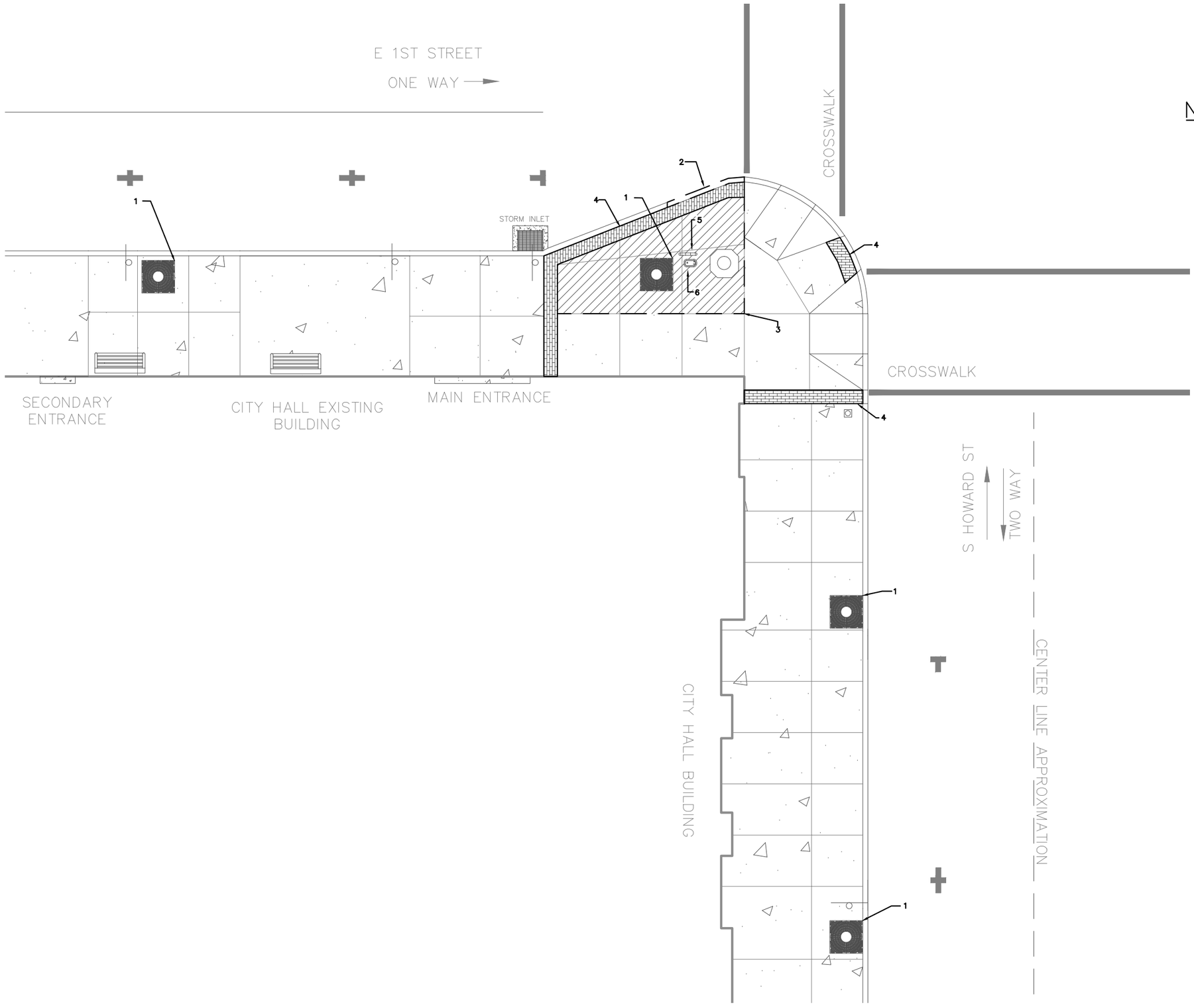
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

EXISTING CONDITIONS PLAN

SHEET

2 OF 10



NOTES:

1. REMOVE TREE AND TREE ROOTS, SALVAGE FRAME AND GRATE FOR REINSTALLATION. PROVIDE ADEQUATE PROTECTION FOR FOOT AND VEHICULAR TRAFFIC DURING TREE REMOVAL.
2. SAW CUT AT NEAREST CURB JOINTS AND AT FACE OF CURB TO REMOVE EXISTING CURB SEGMENT ONLY, LEAVE GUTTER IN PLACE.
3. SAW CUT ALONG EXISTING PANEL SCORE LINES AND REMOVE SIDEWALK PANELS SHOWN.
4. REMOVE ALL BRICK PAVERS SHOWN.
5. REMOVE BIKE RACK.
6. PROTECT UTILITY BOX DURING ENTIRE CONSTRUCTION PROCESS.

North

0 10 20

SCALE: 1"=10'

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

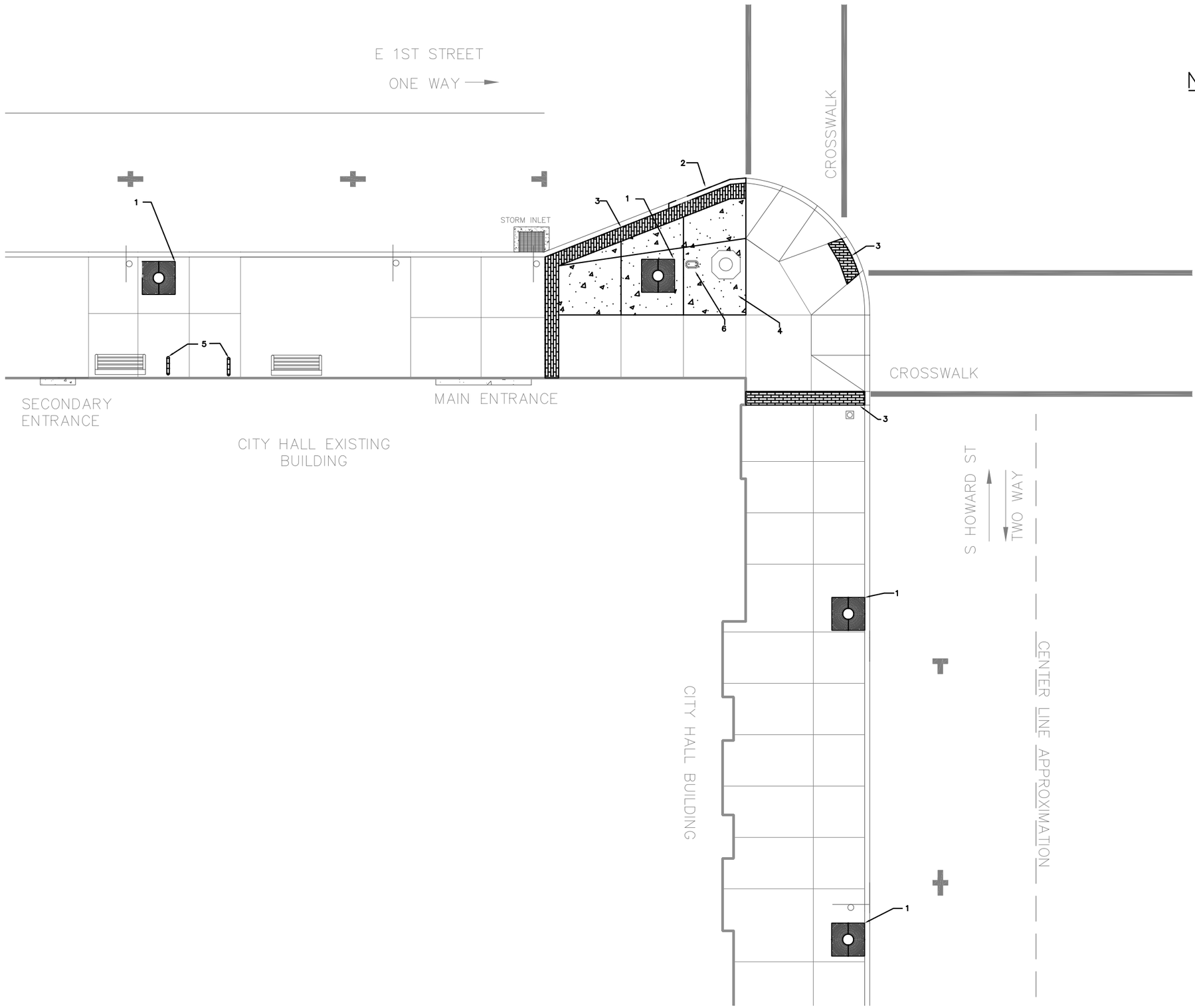
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

DEMOLITION PLAN

SHEET

3 OF 10



NOTES:

1. REINSTALL SALVAGED FRAME AND GRATE DWG #107. PLANT NEW TREE, SPECIES SHALL BE COLUMNAR SARGENT CHERRIES (PRUNUS SARGENTII), DWG #108.
2. REPLACE CURB SEGMENT, MATCHING EXISTING CURB ON EACH SIDE, DWG #501.
3. REPLACE WITH SAND SET PAVERS DWG #700.
4. INSTALL NEW SIDEWALK PANELS DWG #504, MATCH SIDEWALK AND SAND SET PAVERS ALONG PERIMETER. DISCUSS SCORING PATTERN FOR PANEL BELOW ODOT TRAFFIC SIGNAL POLE WITH CITY ENGINEER. TOP OF UTILITY BOX TO BE LOCATED AT GRADE.
5. INSTALL CITY PROVIDED BIKE RACKS. CONSULT WITH CITY PLANNING DEPARTMENT FOR EXACT INSTALLATION LOCATION.
6. TOP OF UTILITY BOX TO BE LOCATED AT GRADE.

North

0 10 20

SCALE: 1"=10'

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

PROPOSED IMPROVEMENT PLAN

CITY HALL BUILDING

REAR ENTRANCE

GRASS

IRRIGATION VALVE

STORM INLET

CLEAN OUT

UTILITY BOX

BUSH

TABLE

PAVERS

STREET SIGN (TYP)

TREE & GRATE

TREE & GRATE

STREET SIGN (TYP)

BUNN BUILDING

ELECTRICAL EQUIPMENT

STAIRS

STAIRS

TREE

TREE

SOIL

BOLLARD (TYP)

BOLLARD (TYP)

SOIL

CONCRETE PAD

CURB

BOLLARD (TYP)

BUSH

ELECTRICAL

STORM INLET

CURB

IRRIGATION BOX

BACK ALLEY

TWO WAY

WATER VALVE

UTILITY POLE (TYP)

S HOWARD ST

TWO WAY

PARALLEL PARKING

PARALLEL PARKING

BOLLARD (TYP)

VETERANS AFFAIRS BUILDING

VETERANS AFFAIRS

TREE

North

0 10 20

SCALE: 1”=10’

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

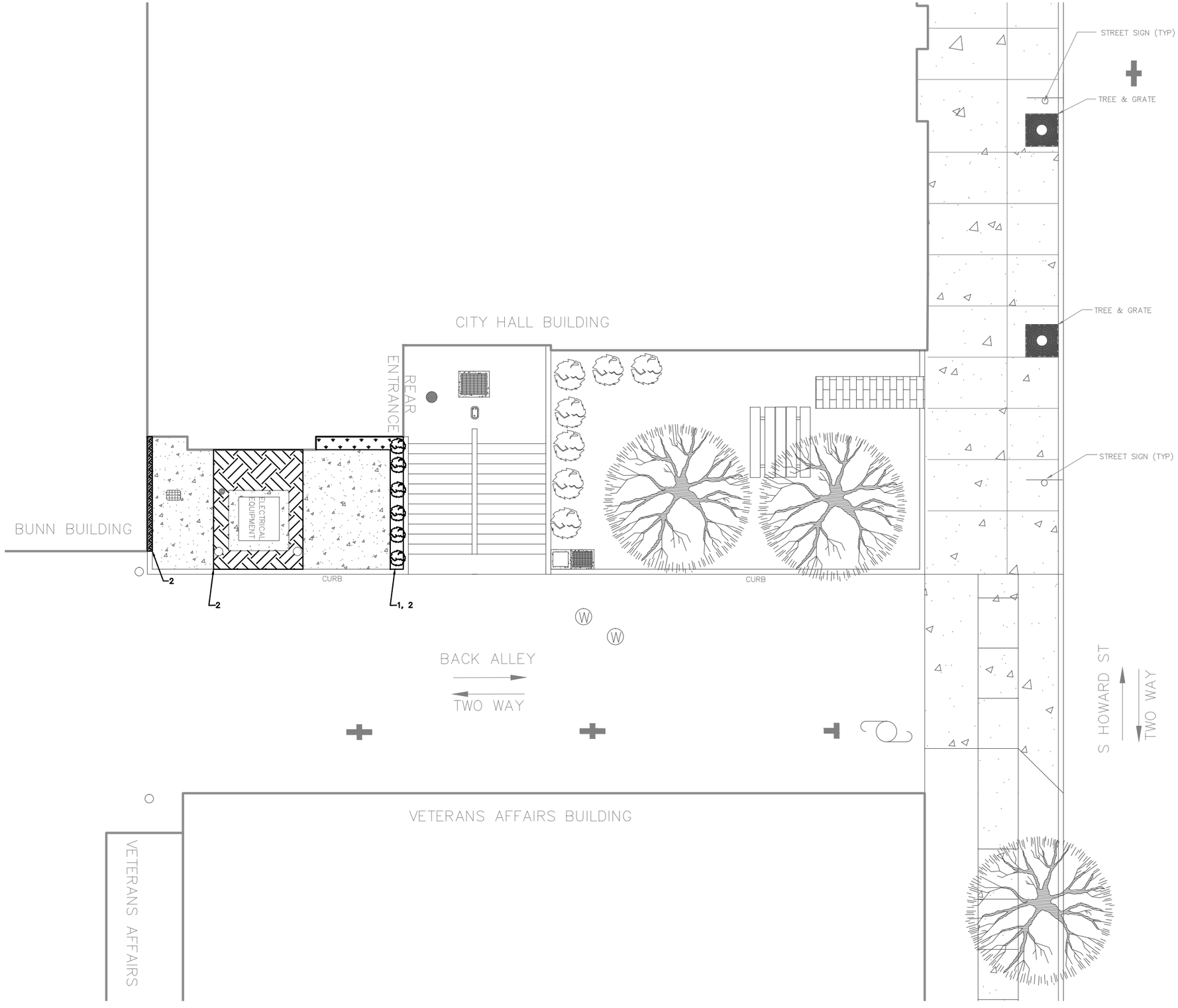
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

EXISTING CONDITIONS PLAN

SHEET

5 OF 10



NOTES:

1. REMOVE SHRUBS AND ALL PLANTS.
2. EXCAVATE SOIL IN PREPARATION FOR THE INSTALLATION OF CONCRETE PANELS.

North

0 10 20

SCALE: 1”=10’

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

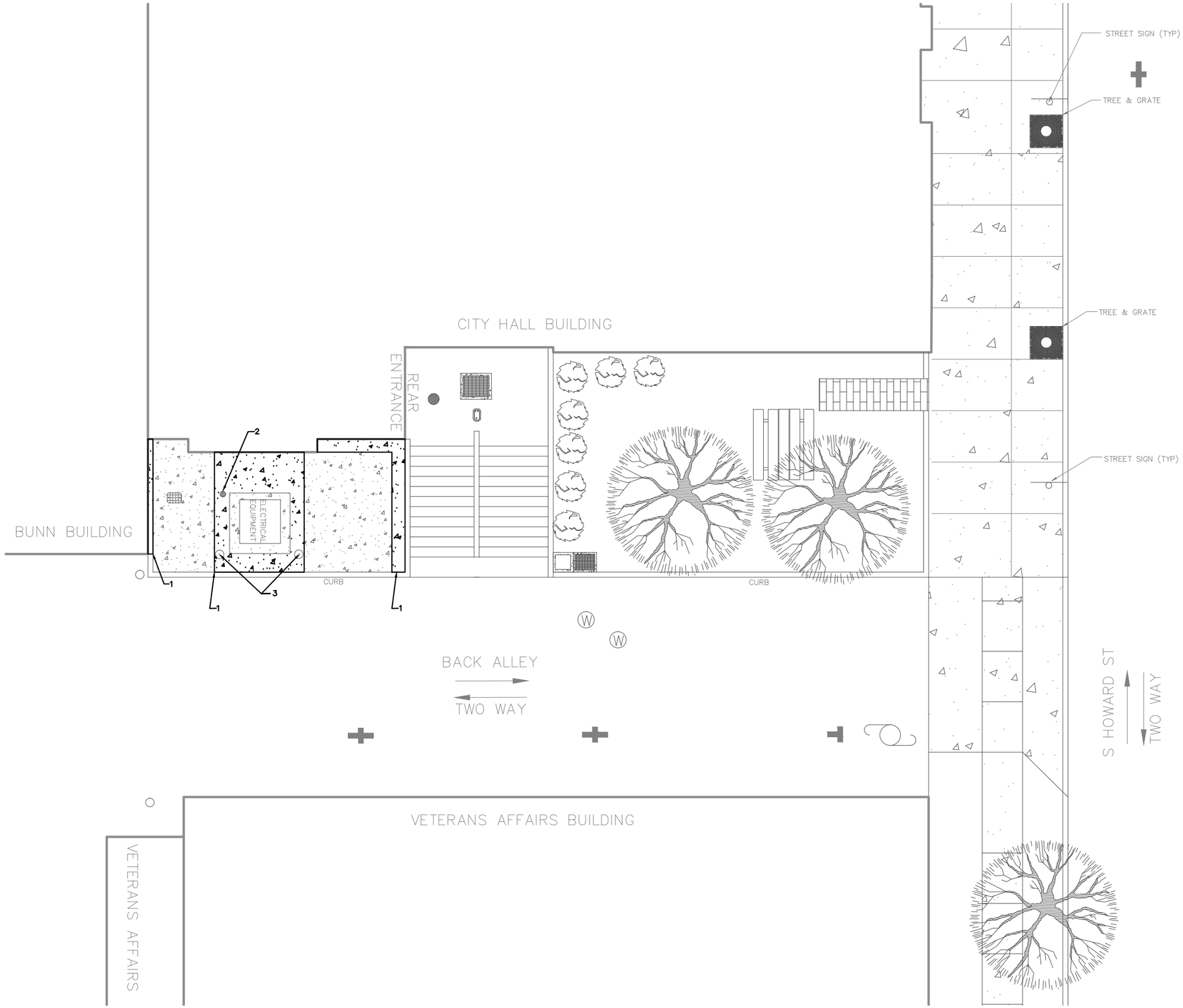
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

DEMOLITION PLAN

SHEET

6 OF 10



NOTES:

1. INSTALL CONCRETE DWG #504, MATCH EXISTING CONCRETE PANEL(S). DO NOT MATCH EXISTING CONCRETE PAD, LOCATED BELOW ELECTRICAL EQUIPMENT.
2. IRRIGATION VALVE TOP TO BE LOCATED AT GRADE.
3. WORK CONCRETE AROUND BOLLARDS, NO RELOCATION IS PROPOSED.
4. CONCRETE TO CONTAIN WATER PROOFING ADMIXTURE, TYPE: KIM KRYTON OR APPROVED EQUIVALENT.

North

0 10 20

SCALE: 1”=10’

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

Rev.	By

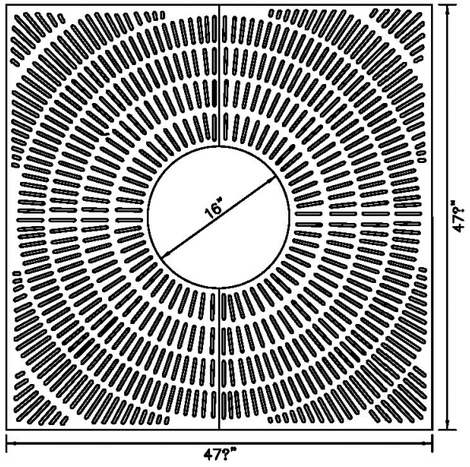
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

PROPOSED IMPROVEMENT PLAN

SHEET

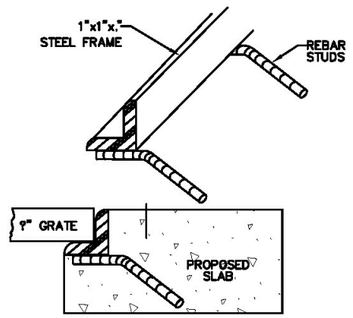
7 OF 10



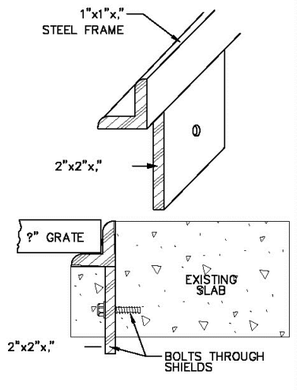
48" "STA" TREE GRATE:

- ADA APPROVED, TWO PEICE SET
- DUCTILE CAST IRON ASTM, A536, CL80-55-06
- APPROXIMATE WEIGHT 226 lbs. PER SET
- OLYMPIC FOUNDRY PART NO. 80-2190 (OR EQUIVALENT)

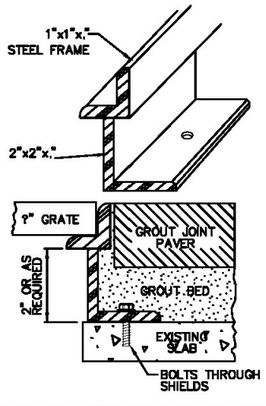
STYLE "CIP"
(NEW SUB-SLAB,
SAND BED)



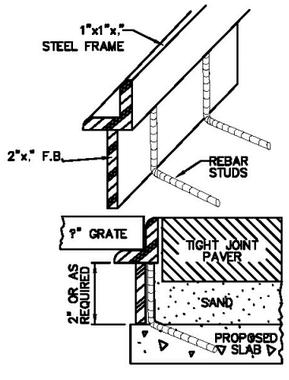
STYLE "RF"
(EXTG. SLAB)



STYLE "AP"
(EXTG. SUB-SLAB,
GROUT BED)



STYLE "CIP"
(NEW SUB-SLAB,
SAND BED)

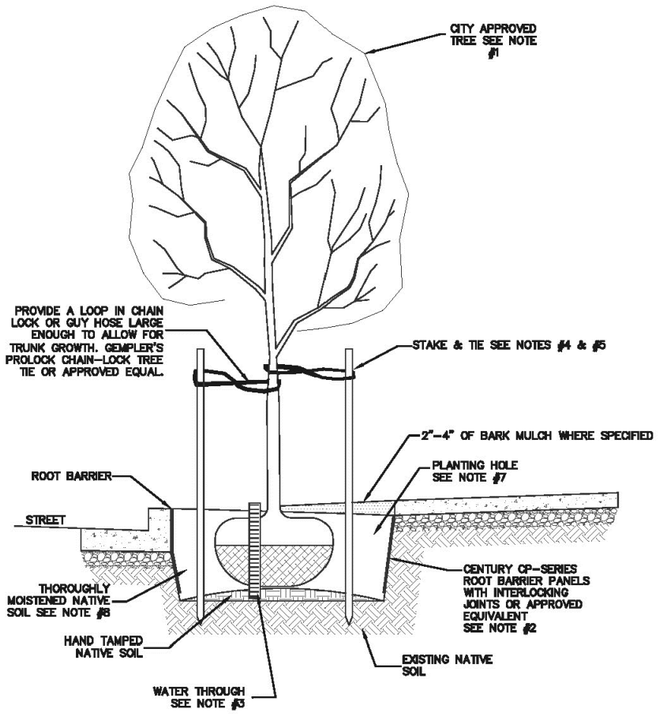


City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

TREE GRATE AND FRAME

SCALE: N.T.S.
DATE: July 2013
APPROVED BY: D. Danicic
STANDARD DRAWING 107



NOTES:

1. REFER TO THE CITY PLANNING DEPARTMENT APPROVED STREET TREE PLANTING LIST.
2. ROOT BARRIER REQUIRED WHEN HARDSCAPE OR STRUCTURE IS LOCATED WITHIN A 6' RADIUS FROM CENTER OF TREE. ROOT BARRIER TO BE 18" DEEP AND SHALL BE INSTALLED ALONG ALL BOUNDARIES WITH A SIDEWALK OR ROADWAY. ROOT BARRIER WILL EXTEND A MINIMUM OF 24" PAST CENTER OF TREE IN EACH DIRECTION. FOLLOW MANUFACTURES SPECIFICATIONS.
3. OPPOSITE TREE STAKES, PROVIDE TWO, 3" DIAMETER HDPE PERFORATED PIPE WATERING THROUGHS, FILLED WITH CLEAN PEA GRAVEL.
4. REMOVE NURSERY STAKES & INSTALL 2" DIAMETER TREATED STAKES, SET OUTSIDE ROOTBALL AND DRIVE A MINIMUM OF 12" INTO UNDISTURBED SOIL BELOW PLANTING HOLE. TRIM STAKE 6" ABOVE HIGHEST TREE TIE TO AVOID INTERFENCE WITH CANOPY.
5. FLEXIBLE NON-ABRASIVE TREE TIE SECURED TO STAKE WITH A NAIL. PLACE TIES 6" ABOVE THE LOWEST POINT ON THE TRUNK WHERE IT CAN BE HELD SUCH THAT THE TOP OF THE TREE SPRINGS BACK TO THE UPRIGHT POSITION WHEN BENT OR DEFLECTED.
6. SET CROWN OF ROOTBALL 1-½" ABOVE FINISHED GRADE.
7. PLANTING HOLE TO BE TWICE THE DIAMETER OF ROOTBALL, WITH ROOTBALL RESTING ON FIRM SOIL. SCARIFY SIDES OF PLANTING HOLE.
8. BACKFILL WITH A MIXTURE OF ⅔ NATIVE SOIL AN ⅓ ORGANIC COMPOST. AREAS WITH POOR OR HEAVILY COMPACTED SOIL MAY REQUIRE ADDITIONAL AMENDMENT.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:
MAY 2014

STREET TREE & ROOT BARRIER

SCALE: N.T.S.
DATE: MARCH 2014
APPROVED BY: JAY H.
STANDARD DRAWING 108

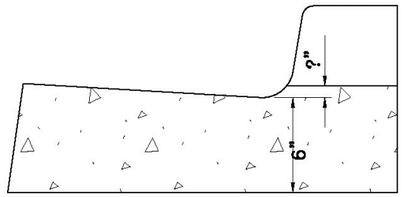
City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

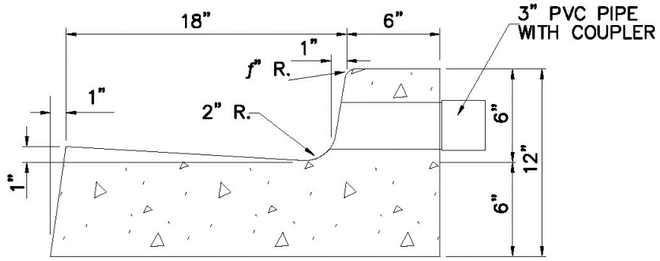
SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

STANDARD DRAWINGS



CURB AND GUTTER AT DRIVEWAY APPROACH



CURB AND GUTTER

NOTES

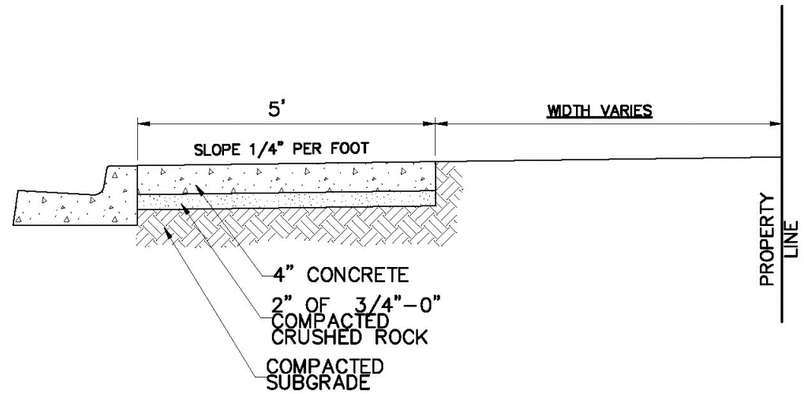
1. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
2. TRANSVERSE CONTRACTION JOINTS – MAKE 1/8" X 1 1/2" DEEP CUT; SPACED AT 15'. PROVIDE CONTRACTION JOINTS AT CURB RETURN POINTS, CATCH BASINS AND DRIVEWAYS.
3. SCORE CURB OVER WEEP HOLE BLOCK OUT.
4. EXPANSION JOINTS SHALL NOT BE USED.
5. APPLY CURING COMPOUND (PETROLEUM BASED) TO FRESH CONCRETE TO RETAIN MOISTURE.
6. TOP OF CURB BRANDED WITH "S" OR "W", 2" MIN. HEIGHT FOR SEWER AND WATER LOCATIONS. HAND SCRIBING NOT ALLOWED.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

CURB AND GUTTER

SCALE: N.T.S.
DATE: May 2007
APPROVED BY: D. Danicic
STANDARD DRAWING 501



NOTES:

1. SLOPE FROM THE PROPERTY LINE TO THE STREET AT 2%.
2. WORK AGGREGATE INTO CONCRETE PRIOR TO FINISHING CONCRETE.
3. FINISHING DETAILS.
   - –EDGE CONCRETE WITH 3" EDGING TROWEL.
   - –SCORE CONCRETE AT 5' INTERVALS.
   - –INSTALL 1/8"x1 1/2" CONTRACTION JOINTS EVERY 15'.
   - –FABRIC TYPE EXPANSION JOINT NOT TO BE USED.
   - –APPLY LIGHT BROOM FINISH TRANSVERSE TO THE SIDEWALK
4. CONCRETE SHALL HAVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
5. APPLY CURING COMPOUND (PETROLEUM BASE) TO FRESH CONCRETE TO RETAIN MOISTURE.
6. TOLERANCES
   - –SURFACE SHALL NOT VARY MORE THAN 1/4" FROM A 10' STRAIGHT EDGE.
   - –ALIGNMENT SHALL BE WITHIN 1/4" OF TRUE LINE.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

SIDEWALK TYPE "B"

SCALE: N.T.S.
DATE: Jan. 2010
APPROVED BY: P. Chiu
STANDARD DRAWING 504

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By	Rev.

SCALE:	AS SHOWN
DATE:	05-30-2014
DRAWN:	GR
DESIGNED:	GR
APPROVED:	JAY HARRIS

CITY HALL FRONTAGE IMPROVEMENTS

STANDARD DRAWINGS

SHEET

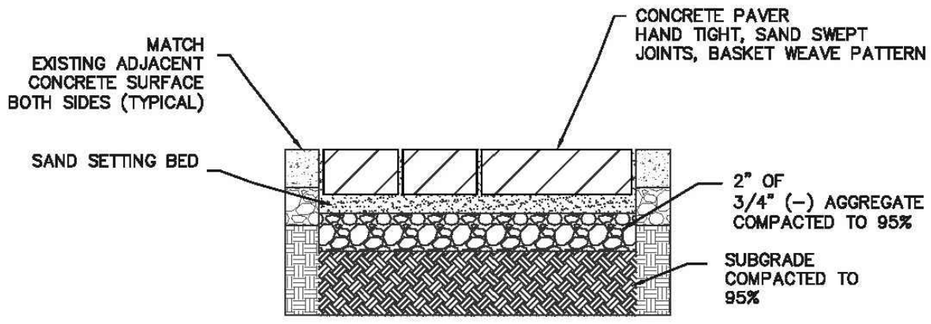
9 OF 10

NOTES:

1. USE "HOLLAND" CONCRETE PAVER TYPICAL DIMENSIONS 200 (mm) X 100 (mm) X 60 (mm), COLOR IS TO BE CLASSIC.
2. DO NOT USE PAVERS WITH CHIPS, CRACKS, DISCOLORATION OR ANY OTHER NOTICEABLE DEFECT.
3. GRADING OF SAND BEDDING MATERIAL TO COMPLY WITH REQUIREMENTS OF ASTM C 33, EXCEPT AS ALLOWED IN TABLE 1 BELOW.
4. FOLLOW MANUFACTURES INSTALLATION PROCEDURE.
5. PAVER TOLERANCES: THERE SHALL BE NO GREATER THAN 1/8" DIFFERENCE BETWEEN THE HEIGHTS OF ADJACENT PAVERS. THE TOP SURFACE OF THE PAVERS SHALL BE 1/8" ABOVE ADJACENT CONCRETE SURFACES. THE TOP SURFACE OF PAVERS MAY BE 1/8" ABOVE THE FINAL ELEVATIONS AFTER COMPACTION.

Table 1

Grading Requirements for Bedding Sand			
ASTM C 33		CSA A23.1-M94	
Sieve Size	Percent Passing	Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100	10.mm	100
No.4 (4.75 mm)	95 to 100	5.mm	95 to 100
No.8 (2.36 mm)	85 to 100	2.5 mm	80 to 100
No.16 (1.18 mm)	50 to 85	1.25 mm	50 to 90
No.30 (0.600 mm)	25 to 60	0.630 mm	25 to 65
No.50 (0.300 mm)	10 to 30	0.315 mm	10 to 35
No.100 (0.150 mm)	2 to 10	0.160 mm	2 to 10



NOTE: THIS DRAWING IS AVAILABLE ONLY WITH PRIOR WRITTEN APPROVAL BY CITY ENGINEER.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

SAND SET PAVERS

SCALE: N.T.S.
DATE: MAY 2014
APPROVED BY: JAY H.
STANDARD DRAWING 700

City of Newberg
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 970
414 E. FIRST ST.
NEWBERG, OREGON 97132
PHONE: (503) 537-1240
FAX: (503) 537-1277

By | Rev.

SCALE: AS SHOWN
DATE: 05-30-2014
DRAWN: GR
DESIGNED: GR
APPROVED: JAY HARRIS

CITY HALL SITE IMRPOVEMENTS

STANDARD DRAWINGS

SHEET
10 OF 10