CLACKAMAS COUNTY
NOTICE OF PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

INVITATION TO BID #2018-17
Wichita Park Construction
March 22, 2018

Clackamas County, on behalf of its departments and its special district North Clackamas Parks and Recreation District, ("County") through its Board of County Commissioners is accepting sealed bids for the **Wichita Park Construction** Project until **May 1, 2018, 2:00 PM,** Pacific Time, ("Bid Closing") at the following location:

DELIVER BIDS TO: Clackamas County Procurement Division, Attention George Marlton, Director, Clackamas County Public Services Building, 2051 Kaen Road, Oregon City, OR 97045, or via email to procurement@clackamas.us

Bid packets are available from 7:00 AM to 6:00 PM Monday through Thursday at the above address or may be obtained at the Clackamas County Procurement Website at http://www.clackamas.us/bids/.

Contact Information
Procurement Process and Technical Questions: Ryan Rice, rrice@clackamas.us, 503-742-5446.

A **Non-Mandatory Pre-Bid Conference** will be conducted on **April 4, 2018** at **10:00 AM.** Bidders shall meet with County representatives at Wichita Park, 5908 SE Monroe Street, Milwaukie, Oregon for that purpose. Attendance will be documented through a sign-in sheet prepared by the County representative.

Prevailing Wage Rates
Prevailing Wage Rates requirements apply to this Project because the maximum compensation for all Owner-contracted Work is more than $50,000. Contractor and all subcontractors shall comply with the provisions of ORS 279C.800 through 279C.870, relative to Prevailing Wage Rates. The Bureau of Labor and Industries (BOLI) wage rates and requirements set forth in the following BOLI booklet (and any listed amendments to that booklet), which are incorporated herein by reference, apply to the Work authorized under this Agreement:

PREVAILING WAGE RATES for Public Works Contracts in Oregon, January 1, 2018, which can be downloaded at the following web address: http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_state.aspx

The Work will take place in Clackamas County, Oregon.

Clackamas County encourages bids from Minority, Women, and Emerging Small Businesses.

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

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CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

INSTRUCTIONS TO BIDDERS

Clackamas County Local Contract Review Board Rules ("LCRB Rules") govern this procurement process. LCRB Rules may be found at: http://www.clackamas.us/code/documents/appendixc.pdf. The Instructions to Bidders is applicable to the procurement process for Clackamas County, or any component unit thereof identified on the Notice of Public Improvement Contract Opportunity, herein after referred to as the "Owner."

Article 1. Scope of Work

The work contemplated under this contract with the Owner, includes all labor, materials, transportation, equipment and services necessary for, and reasonably incidental to, the completion of all construction work in connection with the project described in the Project Manual which includes, but is not necessarily limited to, the Notice of Public Improvement Contract Opportunity, Instructions to Bidders, Supplemental Instructions to Bidders, Bid Form, Bid Bond, Public Improvement Contract Form, Performance Bond, Payment Bond, Clackamas County General Conditions for Public Improvement Contracts (1/1/2017), Supplemental General Conditions, and Plans, Specifications and Drawings.

Article 2. Examination of Site and Conditions

Before making a Bid, the Bidder shall examine the site of the work and ascertain all the physical conditions in relation thereto. The Bidder shall also make a careful examination of the Project Manual including the plans, specifications, and drawings and other contract documents, and shall be fully informed as to the quality and quantity of materials and the sources of supply of the materials. Failure to take these steps will not release the successful Bidder from entering into the contract nor excuse the Bidder from performing the work in strict accordance with the terms of the contract at the price established by the Bid.

The Owner will not be responsible for any loss or for any unanticipated costs, which may be suffered by the successful Bidder, as a result of such Bidder's failure to be fully informed in advance with regard to all conditions pertaining to the work and the character of the work required, including site conditions. No statement made by an elected official, officer, agent, or employee of the Owner in relation to the physical or other conditions pertaining to the site of the work will be binding on the Owner, unless covered by the Project Manual or an Addendum.

Article 3. Interpretation of Project Manual and Approval of Materials Equal to Those Provided in the Specifications

If any Bidder contemplating submitting a Bid for the proposed contract is in doubt as to the true meaning of any part of the plans, specifications or forms of contract documents, or detects discrepancies or omissions, such Bidder may submit to the Architect (read "Engineer" throughout in lieu of Architect as appropriate) a written request for an interpretation thereof at least ten (10) calendar days prior to the date set for the Bid Closing.

When a prospective Bidder seeks approval of a particular manufacturer's material, process or item of equal value, utility or merit other than that designated by the Architect in the Project Manual, the Bidder may submit to the Architect a written request for approval of such substitute at least ten (10) calendar days prior to the date set for the Bid Closing. The prospective Bidder submitting the request will be responsible for its prompt delivery.

Requests of approval for a substitution from that specified shall be accompanied by samples, records of performance, certified copies of tests by

impartial and recognized laboratories, and such other information as the Architect may request.

To establish a basis of quality, certain processes, types of machinery and equipment or kinds of materials may be specified in the Project Manual either by description of process or by designating a manufacturer by name and referring to a brand or product designation or by specifying a kind of material. 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 approved equal" follow such name, designation or description, whether in fact they do so or not.

Any interpretation of the Project Manual or approval of manufacturer's material will be made only by an Addendum duly issued. All Addenda will be posted to the Clackamas County Procurement Website (www.clackamas.us/bid) will become a part of the Project Manual. The Owner will not be responsible for any other explanation or interpretation of the Project Manual nor for any other approval of a particular manufacturer's process or item for any Bidder.

When the Architect approves a substitution by Addendum, it is with the understanding that the Contractor guarantees the substituted article or material to be equal or better than the one specified.

Article 4. Security to Be Furnished by Each Bidder

Each Bid must be accompanied by either 1) a cashier's check or a certified check drawn on a bank authorized to do business in the State of Oregon, or 2) a Bid bond described hereinafter, executed in favor of the Owner, for an amount equal to ten percent (10%) of the total amount Bid as a guarantee that, if awarded the contract, the Bidder will execute the contract and provide a performance bond and payment bond as required. The successful Bidder's check or Bid bond will be retained until the Bidder has entered into a contract satisfactory to Owner and furnished a one hundred percent (100%) performance bond and one hundred percent (100%) payment bond. The Owner reserves the right to hold the Bid security as described in Article 10 hereof. Should the successful Bidder fail to execute and deliver the contract as provided for in Article 12 hereof, including a satisfactory performance bond and payment bond within twenty (20) calendar days after the Bid has been accepted by the Owner, then the contract award made to such Bidder may be considered canceled and the Bid security may be forfeited as liquidated damages at the option of the Owner. The date of the acceptance of the Bid and the award of the contract as contemplated by the Project Manual shall mean the date of acceptance specified in the Notice of Intent to Award.

Article 5. Execution of Bid Bond

Should the Bidder elect to utilize a Bid bond as described in Article 4 in order to satisfy the Bid security requirements, such form must be completed in the following manner:

A. Bid bonds must be executed on the County forms, which will be provided to all prospective Bidders by the Owner.

B. The Bid bond shall be executed on behalf of a bonding company licensed to do business in the State of Oregon.

C. In the case of a sole individual, the bond need only be executed as principal by the sole individual. In the case of a partnership, the bond must be executed by at least one of the partners. In the case of a corporation, the bond must be executed by stating the official name of the corporation under which is placed the signature of an officer authorized to sign on behalf of the corporation followed by such person's official capacity, such as president, etc. The corporation seal should then be affixed to the bond.

D. The name of the surety must be stated in the execution over the signature of its duly authorized attorney-in-fact and accompanied by the seal of the surety corporation.

Article 6. Execution of the Bid Form

Each Bid shall be made in accordance with: (i) the sample Bid Form accompanying these instructions; (ii) the appropriate signatures for a sole individual, partnership, corporation or limited liability corporation shall be added as noted in Article 5C above; (iii) numbers pertaining to base Bids shall be stated both in writing and in figures; and (iv) the Bidder's address shall be typed or printed.

The Bid Form relates to Bids on a specific Project Manual. Only the amounts and information asked for on the Bid Form furnished will be considered as the Bid. Each Bidder shall Bid upon the work exactly as specified and provided in the Bid Form. The Bidder shall include in the Bid a sum to cover the cost of all items contemplated by the Contract. The Bidder shall Bid upon all alternates that may be indicated on the Bid Form. When Bidding on an alternate for which there is no charge, the Bidder shall write the words "No Charge" in the space provided on the Bid Form. If one or more alternates are shown on the Bid Form, the Bidder shall indicate whether each is "add" or "deduct."

Article 7. Prohibition of Alterations to Bid

Bids that are incomplete, or contain ambiguities or have differing conditions required by the Bidder, including requested changes or exceptions to the Public Improvement Contract form or other portions of the Project Manual, may be rejected in Owner’s sole and absolute discretion.

Article 8. Submission of Bid

Each Bid shall be sealed in an envelope, properly addressed to the Owner, showing on the outside of the envelope the name of the Bidder and the name of the project. Bids will be received at the time and place stated in the Notice of Public Improvement Contract Opportunity.

Article 9. Bid Closing and Opening of Bids

All Bids must be received by the Owner at the place and time set for the Bid Closing. Any Bids received after the scheduled Bid Closing time for receipt of Bids will be rejected.

At the time of opening and reading of Bids, each Bid received will be publicly opened and read aloud, irrespective of any irregularities or informalities in such Bids.

Generally, Bid results will be posted to the Procurement Website within a couple hours of the opening.

Article 10. Acceptance or Rejection of Bids by Owner

Unless all Bids are rejected, the Owner will award a contract based on the lowest responsive Bid from a responsible Bidder. If that Bidder does not execute the contract, it will be awarded to the next lowest responsible Bidder or Bidders in succession.

The Owner reserves the right to reject all Bids and to waive minor informalities. The procedures for contract awards shall be in compliance with the provisions of the LCRB Rules in effect at that time.

The Owner reserves the right to hold the Bid and Bid security of the three lowest Bidders for a period of thirty (30) calendar days from and after the time of Bid opening pending award of the contract. Following award of the contract the Bid security of the three lowest Bidders may be held twenty (20) calendar days pending execution of the contract. All other Bids will be rejected and Bid security will be returned.

In determining the lowest Bidder, the Owner reserves the right to take into consideration any or all authorized base Bids as well as alternates or combinations indicated in the Bid Form.

If no Bid has been accepted within thirty (30) calendar days after the opening of the Bids, each of the three lowest Bidders may withdraw the Bid submitted and request the return of the Bid security.

Article 11. Withdrawal of Bid

At any time prior to the Bid Closing, a Bidder may withdraw its Bid. This will not preclude the submission of another Bid by such Bidder prior to the time set for the Bid Closing.

After the time set for the Bid Closing, no Bidder will be permitted to withdraw its Bid within the time frames specified in Article 10 for award and execution, except as provided for in that Article.

Article 12. Execution of Contract, Performance Bond and Payment Bond

The Owner will provide the successful Bidder with contract forms within seven (7) calendar days after the completion of the award protest period. The Bidder is required to execute the contract forms as provided, including a performance bond and a payment bond from a surety company licensed to do surety business in the State of Oregon, within seven (7) calendar days after receipt of the contract forms. The contract forms shall be delivered to the Owner in the number called for and to the location as instructed by the Owner.

Article 13. Recyclable Products

Contractors will use recyclable products to the maximum extent economically feasible in the performance of the Contract.

Article 14. Clarification or Protest of the Solicitation Document or Specifications

Any request for clarification or protest of the solicitation document or specifications must be submitted in the manner provided for in the applicable section of the LCRB Rules to the Procurement Representative referenced in the Notice of Public Improvement Contract Opportunity.

A protest of the Solicitation Document must be received within seven (7) business days of the issuance of the Bid or within three (3) business days of issuance of an addendum.

Requests for clarification may be submitted no less than five (5) business days prior to the Bid Closing Date.

Article 15. Protest of Intent to Award

Owner will name the apparent successful Bidder in a "Notice of Intent to Award" letter. Identification of the apparent successful Bidder is procedural only and creates no right in the named Bidder to the award of the contract. Competing Bidders will be notified by publication of the Notice of Intent to Award on the Clackamas County Procurement Website of the selection of the apparent successful Bidder(s) and Bidders shall be given seven (7) calendar days from the date on the "Notice of Intent to Award" letter to review the file at the Procurement Division office and file a written protest of award, pursuant to C-049-0450. Any award protest must be in writing and must be delivered by hand delivery or mail to the Procurement Division Director at: Procurement Division, 2051 Kaen Road, Oregon City, OR 97045.

Article 16. Disclosure of First-Tier Subcontractors

Within two (2) working hours after the Bid Closing, all Bidders shall submit to the County a disclosure form identifying any first-tier subcontractors (those entities that would be contracting directly with the prime contractor) that will be furnishing labor and materials on the contract, if awarded, whose subcontract value would be equal to or greater than: (a) Five percent (5%) of the total contract price, but at least $15,000; or (b) $350,000, regardless of the percentage of the total contract price.

Disclosures may be submitted with the Bid or may be hand delivered to the Bid Closing address or emailed to procurement@clackamas.us.

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

Project Name #2018-17 Wichita Park Construction

The following modify the Clackamas County "Instructions to Bidders" for this Project. Where a portion of the Instructions to Bidders has been modified by these Supplemental Instructions to Bidders, the unaltered portions shall remain in effect.

1. **Non-mandatory Pre-Bid Conference** will be conducted on **April 4, 2018 at 10:00 AM.** Bidders shall meet with County representatives at Wichita Park, 5908 SE Monroe Street, Milwaukie, Oregon for that purpose. Attendance will be documented through a sign-in sheet prepared by a County representative.

2. **Submission of Bids by email:** Complete Bids (including all attachments) may be emailed and must be electronically received by ***May 1, 2018 2:00 p.m. Pacific Time.*** **If emailed, the Bid must be emailed to the following address: Procurement@clackamas.us. The email subject line must read "Bid for #2018-17 Wichita Park Construction."** Bidders are ***strongly encouraged*** to telephone and confirm electronic receipt of the complete emailed document(s) before the above time and date deadline. Bids delayed or lost by email system filtering or failures may be considered at Clackamas County's sole and absolute discretion.

3. **Good Faith Effort:** Clackamas County encourages participation in contracts by Historically Underrepresented Businesses. "Historically Underrepresented Businesses" are State of Oregon-certified and self-identified minority, women and emerging small business as well as firms that are certified federally or by another state or entity with substantially similar requirements as the State of Oregon.

   Bidders must perform Good Faith Effort (defined below) and submit **Form 1 and Form 2** for the Bidders Bid to be considered responsive. **Form 1 and Form 2** must be submitted within **two (2) hours** after the Closing Date and Time. Form 1 and Form 2 may be submitted by hand delivery to the location the Bid was due or may email the completed Forms to Procurement@clackamas.us. "Good Faith Effort" is a requirement of a prime contractor to reach out to at least three Historically Underrepresented Business Subcontractors for each division of work that will be subcontracted out and to complete the required forms. If fewer than

three Historically Underrepresented Business Subcontractors are reasonably available for a particular division of work, the Bidder must specifically note the reason for there being fewer than three contacts. The outreach should be performed with sufficient time to give the subcontractors at least 5 calendar days to respond to the opportunity. Form 3, which documents the actual amount of subcontractors on the project, must be submitted with the project final pay application. Compliance with the Good Faith Effort and submission of Forms 1, 2 and 3 is a contractual requirement for final payment.

The sufficiency of the documentation or the performance of Good Faith Effort shall be in the sole and absolute determination of Clackamas County. Only those Bidders that Clackamas County has determined have not sufficiently performed Good Faith Effort shall have protest rights of the determination for such Bidder. No Bidder shall have protest rights of the sufficiency of any other Bidder completing Good Faith Effort.

CLACKAMAS COUNTY
GOOD FAITH EFFORT
SUBCONTRACTOR AND SELF-PERFORMED WORK LIST
(FORM 1)

Prime Contractor Name: Total Contract Amount:

Project Name: #2018-17 Wichita Park Construction

PRIME SELF-PERFORMING: Identify below ALL GFE Divisions of Work (DOW) to be self-performed. Good Faith Efforts are otherwise required.

DOW BIDDER WILL SELF-PERFORM *(GFE not required)*	

PRIME CONTRACTOR SHALL DISCLOSE AND LIST ALL SUBCONTRACTORS, including those Minority-owned, Woman-owned, and Emerging Small Businesses ("M/W/ESB") that you intend to use on the project. Hand delivery to Procurement, 2051 Kaen Road, Oregon City, OR 97045 or email to procurement@clackamas.us within 2 hours of the BID/Quote Closing Date/Time

LIST ALL SUBCONTRACTORS BELOW Use correct legal name of Subcontractor (No Assumed Business Names)	Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors	DOLLAR AMOUNT OF SUBCONTRACT	If Certified or self-reporting MBE/WBE/ESB Subcontractor Check box ☑		
			MBE	WBE	ESB
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐

GFE SUBCONTRACTOR AND SELF-PERFORMED WORK LIST (FORM 1) cont'd

Prime Contractor Name: Total Contract Amount:
Project Name: #2018-17 Wichita Park Construction

LIST ALL SUBCONTRACTORS BELOW Use correct legal name of Subcontractor (No Assumed Business Names)	Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors	DOLLAR AMOUNT OF SUBCONTRACT	If Certified or self-reporting MBE/WBE/ESB Subcontractor Check box ✔		
			MBE	WBE	ESB
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐

CLACKAMAS COUNTY
GOOD FAITH EFFORT
M/W/ESB CONTACT / BIDS RECEIVED LOG
(FORM 2)

Prime Contractor:
Project: #2018-17 Wichita Park Construction

Prime Contractor must contact or endeavor to contact at least 3 M/W/ESB Subcontractors for each Division of Work. Prime Contractor shall record its contacts with M/W/ESB Subcontractors through use of this log (or equivalent) entering all required information. All columns shall be completed where applicable. Additional forms may be copied if needed.

NAME OF M/W/ESB SUBCONTRACTOR	Divisions of Work (Painting, electrical, landscaping, etc.)	Date Solicitation Letter / Fax Sent	PHONE CONTACT		BID ACTIVITY Check Yes or No			REJECTED BIDS (if bid received & not used)		Notes
			Date of Call	Person Receiving Call	Will Bid	Bid Received	Bid Used	Bid Amount	Reason Not Used (Price, Scope or Other. If Other, explain in Notes>>)	
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
					☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			

CLACKAMAS COUNTY
GOOD FAITH EFFORT
PROJECT COMPLETION REPORT
(FORM 3)

Prime Contractor Name: Total Contract Amount:
Project Name: #2018-17 Wichita Park Construction

Complete this form and submit with your request for final payment upon the project completion. Please list all subcontractors used for the project. Use additional sheets as necessary.

LIST ALL SUBCONTRACTORS BELOW Use correct legal name of Subcontractor (No Assumed Business Names)	Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors	FINAL DOLLAR AMOUNT OF SUBCONTRACT	If Certified or self-reported MBE/WBE/ESB Subcontractor Check box ✔		
			MBE	WBE	ESB
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐
Name Address City/St/Zip Phone# OCCB#			☐	☐	☐

BY SIGNING BELOW, I HEREBY CERTIFY THAT THE ABOVE LISTED FIRMS HAVE BEEN UTILIZED BY OUR COMPANY IN THE AMOUNTS REPRESENTED ABOVE AND THAT THE INFORMATION CONTAINED HEREIN IS COMPLETE AND ACCURATE. .

Authorized Signature of Contractor Representative

Date

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID BOND

Project Name: #2018-17 Wichita Park Construction

We, _____, as "Principal,"
(Name of Principal)

and _____, an _____ Corporation,
(Name of Surety)

authorized to transact Surety business in Oregon, as "Surety," hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto North Clackamas Parks and Recreation ("Obligee") the sum of ($_____)

_____ dollars.

WHEREAS, the condition of the obligation of this bond is that Principal has submitted its proposal or bid to an agency of the Obligee in response to Obligee's procurement document (No.) for the project identified above which proposal or bid is made a part of this bond by reference, and Principal is required to furnish bid security in an amount equal to ten (10%) percent of the total amount of the bid pursuant to the procurement document.

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives this _____day of _____, 20____.

Principal:_____

By:_____
Signature

_____
Official Capacity

Attest:_____
Corporation Secretary

Surety:_____

By: Attorney-In-Fact

_____
Name

_____
Address

_____
City State Zip

_____ _____
Phone Fax

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID FORM

PROJECT: **#2018-17 Wichita Park Construction**
BID CLOSING: May 1, 2018, 2:00 PM, Pacific Time
BID OPENING: May 1, 2018, 2:05 PM, Pacific Time

FROM: _____
Bidder's Name (must be full legal name, not ABN/DBA)

TO: Clackamas County
Procurement Division – Attention George Marlton, Director
2051 Kaen Road
Oregon City, OR 97045

1. Bidder is (*check one of the following and insert information requested*):

____a. An individual; or

____b. A partnership registered under the laws of the State of _____; or

____c. A corporation organized under the laws of the State of _____; or

____d. A limited liability corporation organized under the laws of the State of _____;

and authorized to do business in the State of Oregon hereby proposes to furnish all material and labor and perform all work hereinafter indicated for the above project in strict accordance with the Contract Documents for the Basic Bid as follows:

_____ Dollars ($_____)

and the Undersigned agrees to be bound by the following documents:

- Notice of Public Improvement Contract Opportunity
- Instructions to Bidders
- Supplemental Instructions to Bidders
- Bid Bond
- Public Improvement Contract Form
- Performance Bond and Payment Bond
- Clackamas County General Conditions
- Supplemental General Conditions
- Prevailing Wage Rates
- Payroll and Certified Statement Form
- Plans, Specifications and Drawings

- ADDENDA numbered _____ through_____, inclusive *(fill in blanks)*

2. The Undersigned proposes to add to or deduct from the Base Bid indicated above the items of work relating to the following Alternate(s) as designated in the Specifications: **N/A**

3. The Undersigned proposes to add to or deduct from the Base Bid indicated above the items or work relating to the following Unit Price(s) as designated in the Specifications, for which any adjustments in the Contract amount will be made in accordance with Section D of the Clackamas County General Conditions: ***Return attached Schedule of Prices.***

4. The work shall be completed within the time stipulated and specified in Section 01 10 00 of the Specifications, PART 1 GENERAL, 1.3 H.

5. Accompanying herewith is Bid Security which is equal to ten percent (10%) of the total amount of the Basic Bid.

6. The Undersigned agrees, if awarded the Contract, to execute and deliver to Clackamas County, within twenty (20) calendar days after receiving the Contract forms, a Contract Form, and a satisfactory Performance Bond and Payment Bond each in an amount equal to one hundred percent (100%) of the Contract sum, using forms provided by the Owner. The surety requested to issue the Performance Bond and Payment Bond will be:

_____.
(name of surety company - not insurance agency)

The Undersigned hereby authorizes said surety company to disclose any information to the Owner concerning the Undersigned's ability to supply a Performance Bond and Payment Bond each in the amount of the Contract.

7. The Undersigned further agrees that the Bid Security accompanying the Bid is left in escrow with Clackamas County; that the amount thereof is the measure of liquidated damages which the Owner will sustain by the failure of the Undersigned to execute and deliver the above-named Contract Form, Performance Bond and Payment Bond, each as published, and that if the Undersigned defaults in either executing the Contract Form or providing the Performance Bond and Payment Bond within twenty (20) calendar days after receiving the Contract forms, then the Bid Security shall become the property of the Owner at the Owner's option; but if the Bid is not accepted within thirty (30) calendar days of the time set for the opening of the Bids, or if the Undersigned executes and timely delivers said Contract Form, Performance Bond and Payment Bond, the Bid Security shall be returned.

8. The Undersigned certifies that: (i) This Bid has been arrived at independently and is being submitted without collusion with and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to bid designed to limit independent bidding or competition; and (ii) the contents of the Bid have not been communicated by the Undersigned or its employees or agents to any person not an employee or agent of the Undersigned or its surety on any Bond furnished with the Bid and will not be communicated to such person prior to the official opening of the Bid.

9. The undersigned ☐ **HAS,** ☐ **HAS NOT** (*check one*) paid unemployment or income taxes in Oregon within the past 12 months and ☐ **DOES,** ☐ **DOES NOT** (*check one*) a business address in Oregon. The undersigned acknowledges that, if the selected bidder, that the undersigned will have to pay all applicable taxes and register to do business in the State of Oregon before executing the Contract Form.

10. The Undersigned agrees, if awarded a contract, to comply with the provisions of ORS 279C.800 through 279C.870 pertaining to the payment of the prevailing rates of wage.

11. Contractor's CCB registration number is _____. As a condition to submitting a bid, a Contractor must be registered with the Oregon Construction Contractors Board in accordance with ORS 701.035 to 701.055, and disclose the registration number. Failure to register and disclose the number will make the bid unresponsive and it will be rejected, unless contrary to federal law.

12. The successful Bidder hereby certifies that all subcontractors who will perform construction work as described in ORS 701.005(2) were registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time the subcontractor(s) made a bid to work under the contract.

13. The successful Bidder hereby certifies that, in compliance with the Worker's Compensation Law of the State of Oregon, its Worker's Compensation Insurance provider is _____, Policy No. _____, and that Contractor shall submit Certificates of Insurance as required.

14. Contractor's Key Individuals for this project (supply information as applicable):
Project Executive: _____, Cell Phone: _____,
Project Manager: _____, Cell Phone: _____,
Job Superintendent: _____, Cell Phone: _____,
Project Engineer: _____, Cell Phone: _____.

15. The Undersigned certifies that it has not discriminated against minority, women, or emerging small businesses in obtaining any subcontracts for this project.

REMINDER: Bidder must submit the below First-Tier Subcontractor Disclosure Form.

By signature below, Contractor agrees to be bound by this Bid.

NAME OF FIRM _____
ADDRESS _____
_____
TELEPHONE NO _____

EMAIL _____

SIGNATURE 1) _____
Sole Individual
or 2) _____
Partner
or 3) _____
Authorized Officer or Employee of Corporation

***** *END OF BID* *****

BID #2018-17- Wichita Park Construction

SCHEDULE OF PRICES

Provide price breakout for the following major categories of items including percentage of overhead and profit. All prices to be inclusive of profit and overhead.

1.	Erosion/Sediment Control	$_____
2.	Clearing & Grubbing	$_____
3.	Earthwork/Soil Preparation	$_____
4.	Asphalt Paving and Striping	$_____
5.	Permeable Concrete Paving	$_____
6.	Concrete Paving and Curbs	$_____
7.	Play Equipment and Play Surfacing	$_____
8.	Fencing	$_____
9.	Drainage System	$_____
10.	Electrical	$_____
11.	Site Furnishings	$_____
12.	Planting and Seeding	$_____
13.	Irrigation	$_____

TOTAL LUMP SUM BID $_____

Name of Firm_____

Name (Print) _____

Authorized Signature_____ Date_____

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM
PROJECT: #2018-17 Wichita Park Construction

BID OPENING: May 1, 2018, 2:00 PM, Pacific Time

Failure to submit this Form by the disclosure deadline will result in a nonresponsive bid.

INSTRUCTIONS:

This First-Tier Subcontractor Disclosure Form ("Form") must be submitted and received at the location specified in the Notice of Public Improvement Contract Opportunity on the advertised Bid Closing, and within two working hours after the advertised Bid Closing Time.

The Form may be mailed, hand-delivered or emailed to: Procurement@clackamas.us. It is the responsibility of Bidders to submit this Form and any additional sheets with the Project name clearly marked on the envelope or the subject line of the email.

Subcontractor lists may be submitted with the bid in the same envelope or email at the Bid Closing date and time. Subcontractor lists **MUST** be submitted within **two (2) hours** of the Bid Closing date and time.

List below the name of each subcontractor that will be furnishing labor, or labor and materials, for which disclosure is required, the category of work that the subcontractor will be performing, and the dollar value of the subcontract. Enter **"NONE"** if the value of the project bid is less than $100,000 or there are no subcontractors that need to be disclosed. ATTACH ADDITIONAL SHEETS IF NECESSARY.

	SUBCONTRACTOR NAME	DOLLAR VALUE	CATEGORY OF WORK
1.			
2.			
3.			
4.			
5.			
6.			

The above listed first-tier subcontractor(s) are providing labor, or labor and material, with a Dollar Value equal to or greater than:

a) 5% of the total Contract Price, but at least $15,000. If the Dollar Value is less than $15,000 do not list the subcontractor above; or
b) $350,000 regardless of the percentage of the total Contract Price.

Firm Name:_____

Bidder Signature:_____ Phone #_____

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

This Public Improvement Contract (the "Contract"), is made by and between the Clackamas County and North Clackamas Parks and Recreation District, both political subdivisions of the State of Oregon, hereinafter called "Owner," and Contractor Name (No DBA/ABN), hereinafter called the "Contractor" (collectively the "Parties"), shall become effective on the date this Contract has been signed by all the Parties and all County approvals have been obtained, whichever is later.

Project Name: **#2018-17 Wichita Park Construction**

1. Contract Price, Contract Documents and Work.
The Contractor, in consideration of the sum of Dollars ($) (the "Contract Price"), to be paid to the Contractor by Owner in the manner and at the time hereinafter provided, and subject to the terms and conditions provided for in the Instructions to Bidders and other Contract Documents (as defined in the Clackamas County General Conditions for Public Improvement Contracts (11/1/2017) ("General Conditions") referenced within the Instructions to Bidders), all of which are incorporated herein by reference, hereby agrees to perform all Work described and reasonably inferred from the Contract Documents. The Contract Price is the amount contemplated by the Base Bid adjusted for Alternates **[Identify accepted Alternates]**, as indicated in the accepted Bid.

Also, the following documents are incorporated by reference in this Contract and made a part hereof:

- Notice of Contract Opportunity
- Supplemental Instructions to Bidders
- Public Improvement Contract Form
- Clackamas County General Conditions
- Prevailing Wage Rates
- Plans, Specifications and Drawings
- Instructions to Bidders
- Bid Bond
- Performance Bond and Payment Bond
- Supplemental General Conditions
- Payroll and Certified Statement Form

2. Representatives.
Contractor has named as its' Authorized Representative to act on its behalf. Owner designates, or shall designate, its Authorized Representative as indicted below (check one):

☒ Unless otherwise specified in the Contract Documents, the Owner designates Kathryn Krygier as its Authorized Representative in the administration of this Contract. The above-named individual shall be the initial point of contact for matters related to Contract performance, payment, authorization, and to carry out the responsibilities of the Owner.

☐ Name of Owner's Authorized Representative shall be submitted by Owner in a separate writing.

3. Key Persons.
The Contractor's personnel identified below shall be considered Key Persons and shall not be replaced during the project without the written permission of Owner, which shall not be unreasonably withheld. If the Contractor intends to substitute personnel, a request must be given to Owner at least 30 days prior to the intended time of substitution. When replacements have been approved by Owner, the Contractor shall provide a transition period of at least 10 working days during which the original and replacement personnel shall be working on the project concurrently. Once a replacement for any of these staff members is authorized, further

replacement shall not occur without the written permission of Owner. The Contractor's project staff shall consist of the following personnel:

Project Executive: shall be the Contractor's project executive, and will provide oversight and guidance throughout the project term.

Project Manager: shall be the Contractor's project manager and will participate in all meetings throughout the project term.

Job Superintendent: shall be the Contractor's on-site job superintendent throughout the project term.

Project Engineer: shall be the Contractor's project engineer, providing assistance to the project manager, and subcontractor and supplier coordination throughout the project term.

4. Contract Dates.
COMMENCEMENT DATE: Upon Issuance of Notice to Proceed ("NTP")
SUBSTANTIAL COMPLETION DATE: September 15, 2018 (Except for seeding and plant establishment)
FINAL COMPLETION DATE: October 1, 2018

Time is of the essence for this Contract. It is imperative that the Work in this Contract reach Substantial Completion and Final Completion by the above specified dates.

5. Insurance Certificates.
In accordance with Section G.3.5 of the General Conditions, Contractor shall furnish proof of the required insurance naming Clackamas County and North Clackamas Parks and Recreation as an additional insured. Insurance certificates may be returned with the signed Contract or may emailed to Procurement@clackamas.us.

6. Tax Compliance.
Contractor must, throughout the duration of this Contract and any extensions, comply with all tax laws of this state and all applicable tax laws of any political subdivision of this state. Any violation of this section shall constitute a material breach of this Contract. Further, any violation of Contractor's warranty in this Contract that Contractor has complied with the tax laws of this state and the applicable tax laws of any political subdivision of this state also shall constitute a material breach of this Contract. Any violation shall entitle County to terminate this Contract, to pursue and recover any and all damages that arise from the breach and the termination of this Contract, and to pursue any or all of the remedies available under this Contract, at law, or in equity, including but not limited to: (A) Termination of this Contract, in whole or in part; (B) Exercise of the right of setoff, and withholding of amounts otherwise due and owing to Contractor, in an amount equal to County's setoff right, without penalty; and (C) Initiation of an action or proceeding for damages, specific performance, declaratory or injunctive relief. County shall be entitled to recover any and all damages suffered as the result of Contractor's breach of this Contract, including but not limited to direct, indirect, incidental and consequential damages, costs of cure, and costs incurred in securing replacement performance. These remedies are cumulative to the extent the remedies are not inconsistent, and County may pursue any remedy or remedies singly, collectively, successively, or in any order whatsoever.

The Contractor represents and warrants that, for a period of no fewer than six calendar years preceding the effective date of this Contract, has faithfully complied with: (A) All tax laws of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318; (B) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, to Contractor's property, operations, receipts, or income, or to Contractor's performance of or compensation for any work performed by Contractor; (C) Any tax

provisions imposed by a political subdivision of this state that applied to Contractor, or to goods, services, or property, whether tangible or intangible, provided by Contractor; and (D) Any rules, regulations, charter provisions, or ordinances that implemented or enforced any of the foregoing tax laws or provisions.

7. Confidential Information.
Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Contract, be exposed to or acquire information that is confidential to Owner. Any and all information of any form obtained by Contractor or its employees or agents in the performance of this Contract shall be deemed confidential information of Owner ("Confidential Information"). Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purpose unless specifically authorized in writing under this Contract.

8. Counterparts.
This Contract may be executed in several counterparts, all of which when taken together shall constitute an agreement binding on all Parties, notwithstanding that all Parties are not signatories to the same counterpart. Each copy of the Contract so executed shall constitute an original.

9. Integration.
All provisions of state law required to be part of this Contract, whether listed in the General or Special Conditions or otherwise, are hereby integrated and adopted herein. Contractor acknowledges the obligations thereunder and that failure to comply with such terms is a material breach of this Contract.

The Contract Documents constitute the entire agreement between the parties. There are no other understandings, agreements or representations, oral or written, not specified herein regarding this Contract. Contractor, by the signature below of its authorized representative, hereby acknowledges that it has read this Contract, understands it, and agrees to be bound by its terms and conditions.

In witness whereof, Clackamas County executes this Contract and the Contractor does execute the same as of the day and year first above written.

Contractor DATA:
(Insert Contractor Name & Address)

Contractor CCB # Expiration Date:
Oregon Business Registry # Entity Type: State of Formation:

Signature page to follow.

Payment information will be reported to the IRS under the name and taxpayer ID# provided by the Contractor. Information must be provided prior to contract approval. Information not matching IRS records could subject Contractor to 28 percent backup withholding.

Contractor Name (No DBA/ABN)	Clackamas County Board of County Commissioners
_____	_____
Authorized Signature Date	Chair Date
_____	_____
Name / Title Printed	Recording Secretary
	APPROVED AS TO FORM
	_____
	County Counsel Date

CLACKAMAS COUNTY GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS

November 1, 2017

INSTRUCTIONS: The attached **Clackamas County General Conditions for Public Improvement Contracts ("County General Conditions")** apply to all designated Public Improvement contracts. Changes to the County General Conditions (including any additions, deletions or substitutions) should only be made by attaching Public Improvement Supplemental General Conditions. The text of these County General Conditions should not otherwise be altered.

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CLACKAMAS COUNTY GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS ("County General Conditions")

SECTION A
GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

In the Contract Documents the following terms shall be as defined below:

APPLICABLE LAWS, means all federal, state and local laws, codes, rules, regulations and ordinances, as amended applicable to the Work, to the Contract, or to the parties individually.

ARCHITECT/ENGINEER, means the Person appointed by the Owner to make drawings and specifications and, to provide contract administration of the Work contemplated by the Contract to the extent provided herein or by supplemental instruction of Owner (under which Owner may delegate responsibilities to the Architect/Engineer), in accordance with ORS Chapter 671 (Architects) or ORS Chapter 672 (Engineers) and administrative rules adopted thereunder.

AVOIDABLE DELAYS, mean any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that: (a) Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors; (b) Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract Time; (c) Do not impact activities on the accepted critical path schedule; and (d) Are associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent the completion of the whole Work within the Contract Time.

BIDDER, means a bidder in connection with Instructions to Bidders or a proposer in connection with a Request for Proposals, or Solicitation Document. May also be referenced as "Offeror," "Quoter" or "Proposer" based on the type of Solicitation Document.

CHANGE ORDER, means a written order which, when fully executed by the Parties to the Contract, constitutes a change to the Contract Documents. Change Orders shall be issued in accordance with the changes provisions in Section D and, if applicable, establish a Contract Price or Contract Time adjustment. A Change Order shall not be effective until executed by both parties.

CLAIM, means a demand by Contractor pursuant to Section D.3 for review of the denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, submitted in accordance with the requirements and within the time limits established for review of Claims in these County General Conditions.

CONTRACT, means the written agreement between the Owner and the Contractor comprised of the Contract Documents which describe the Work to be done and the obligations between the parties.

CONTRACT DOCUMENTS, means the Contract, County General Conditions, Supplemental General Conditions if any, Plans, Specifications, the accepted Offer, Solicitation Document and addenda thereto, Instructions to Offerors, and Supplemental Instructions to Offerors.

CONTRACT PERIOD, as set forth in the Contract Documents, means the total period of time beginning with the full execution of a Contract and, if applicable, the issuance of a Notice to Proceed and concluding upon Final Completion.

CONTRACT PRICE, means the total price reflected in the Contract.

CONTRACT TIME, means any incremental period of time allowed under the Contract to complete any portion of the Work as reflected in the Project schedule.

CONTRACTOR, means the Person awarded the Contract for the Work contemplated.

DAYS, are calendar days, including weekdays, weekends and holidays, unless otherwise specified.

DEFECTIVE WORK, means Work that is not completed in accordance with the Specifications or the requirements of the Contract.

DIRECT COSTS, means, unless otherwise provided in the Contract Documents: the cost of materials, including sales tax and the cost of delivery; cost of labor which shall only include the applicable prevailing wage and fringe benefit (if applicable, and if paid to or on behalf of the employee) rate plus a maximum of a twelve percent (12%) markup on the prevailing wage (but not the fringe benefit) to cover Contractor's labor burden including but not limited to social security, Medicare, unemployment insurance, workers' compensation insurance, sick leave pay; substantiated Project cost increases for specific insurance (including, without limitation, Builder's Risk Insurance and Builder's Risk Installation Floater) or bond premiums; rental cost of equipment, and machinery required for execution of the Work; and the additional costs of field personnel directly attributable to the Work; travel expense reimbursement only if specifically authorized and only to the extent allowable under the County Contractor Travel Reimbursement Policy, hereby incorporated by reference.

FINAL COMPLETION, means the final completion of all requirements under the Contract, including Contract Closeout as described in Section K but excluding Warranty Work as described in Section I.2, and the final payment and release of all retainage, if any.

FORCE MAJEURE, means an act, event or occurrence caused by fire, riot, war, acts of God, terrorism, nature, sovereign, or public enemy, strikes, freight embargoes or any other act, event or occurrence that is beyond the control of the party to the Contract who is asserting Force Majeure.

NOTICE TO PROCEED, means the official written notice from the Owner stating that the Contractor is to proceed with the Work defined in the Contract Documents.

OFFER, means a bid in connection with Instructions to Bidders or a proposal in connection with a Request for Proposals, or Solicitation Document to do the work stated in the Solicitation Document at the price quoted. May also be referenced as "Bid," "Quote," or "Proposal" based on the type of Solicitation Document.

OVERHEAD, means those items which may be included in the Contractor's markup (general and administrative expense and profit) and that shall not be charged as Direct Cost of the Work, including without limitation such Overhead expenses as wages or salary of personnel above the level of foreman (i.e., superintendents and project managers), labor rates and fringe benefits above the applicable prevailing wage and fringe benefit (if applicable, and if paid to or on behalf of the employee), Contractor's labor burden for fringe benefit if paid to the employee, expenses of Contractor's offices and supplies at the Project Site (e.g. job trailer) and at Contractor's principal place of business and including expenses of personnel staffing the Project Site office and Contractor's principal place of business, and Commercial General Liability Insurance and Automobile Liability Insurance.

OWNER, means, Clackamas County or any component unit thereof including Clackamas County Development Agency, Clackamas County Service District No. 1, Surface Water Management Agency of Clackamas County, Tri-City Service District, Water Environment Services, North

Clackamas Parks and Recreation District, Clackamas County Extension & 4-H Service District, Library Service District of Clackamas County, Enhanced Law Enforcement District, and Clackamas County Service District No. 5. Owner may elect, by written notice to Contractor, to delegate certain duties to more than one agent, including without limitation, to an Architect/Engineer. However, nothing in these County General Conditions is intended to abrogate the separate design professional responsibilities of Architects under ORS Chapter 671 or of Engineers under ORS Chapter 672.

PERSON, means a natural person or entity doing business as a sole proprietorship, a partnership, a joint venture, a corporation, a limited liability company or partnership, a nonprofit, a trust, or any other entity possessing the legal capacity to contract.

PLANS, means the drawings which show the location, type, dimensions, and details of the Work to be done under the Contract.

PRODUCT DATA, means illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

PROJECT, means the total undertaking to be accomplished for Owner by architects/engineers, contractors, and other others, including planning, study, design, construction, testing, commissioning, start-up, of which the Work to be performed under the Contract Documents is a part.

PROJECT SITE, means the specific real property on which the Work is to be performed, including designated contiguous staging areas, that is identified in the Plans, Specifications and Drawings.

PUNCH LIST, means the list of Work yet to be completed or deficiencies which need to be corrected in order to achieve Final Completion of the Contract.

RECORD DOCUMENT, means the as-built Plans, Specifications, testing and inspection records, product data, samples, manufacturer and distributor/supplier warranties evidencing transfer of ownership to Owner, operational and maintenance manuals, shop drawings, correspondence, certificate(s) of occupancy, and other documents listed in Subsection B.9.1 of these County General Conditions, recording all Services performed.

SAMPLES, means physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

SHOP DRAWINGS, means drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor (including any subsubcontractor), manufacturer, supplier, or distributor to illustrate some portion of the Work.

SOLICITATION DOCUMENT, means an Invitation to Bid, Request for Proposals, Request for Quotes, or other written document issued by Owner that outlines the required Specifications necessary to submit an Offer.

SPECIFICATION, means any description of the physical or functional characteristics of the Work, or of the nature of a supply, service or construction item included in the Solicitation Document. Specifications may include a description of any requirement for inspecting, testing or preparing a supply, service or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the results or products to be obtained and may, on occasion, describe the method and manner of doing the Work to be performed. Specifications may be incorporated by reference and/or may be attached to the Contract.

SUBCONTRACTOR, means a Person having a direct contract with the Contractor, or another Subcontractor of any tier, to perform one or more items of the Work.

SUBSTANTIAL COMPLETION, means the date when the Owner accepts in writing the construction, alteration or repair constituting the Work or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.3.2.

SUBSTITUTIONS, means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Substitutions also means the performance of the Work by a labor force other than what is submitted in the Offer.

SUPPLEMENTAL GENERAL CONDITIONS, means those conditions that remove from, add to, or modify these County General Conditions. Public Improvement Supplemental General Conditions may be included in the Solicitation Document or may be a separate attachment to the Contract.

UNAVOIDABLE DELAYS, mean delays other than Avoidable Delays that are: (a) to the extent caused by any actions of the Owner, or any other employee or agent of the Owner, or by a separate contractor employed by the Owner; (b) to the extent caused by any Project Site conditions which differ materially from the conditions that would normally be expected to exist and inherent to the construction activities defined in the Contract Documents; or (c) to the extent caused by Force Majeure acts, or events or occurrences.

WORK, means the furnishing of all materials, equipment, labor, transportation, services, incidentals, those permits and regulatory approvals not provided by the owner necessary to successfully complete any individual item or the entire Contract and the carrying out of duties and obligations imposed by the Contract Documents for the Project.

A.2 SCOPE OF WORK

The Work contemplated under the Contract includes all labor, materials, transportation, equipment and services for, and incidental to, the completion of all work in connection with the Project described in the Contract Documents. The Contractor shall perform all Work necessary so that the Project can be legally occupied and fully used for the intended use as set forth in the Contract Documents.

A.3 INTERPRETATION OF CONTRACT DOCUMENTS

A.3.1 Unless otherwise specifically defined in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Contract Documents are intended to be complementary. Whatever is called for in one, is interpreted to be called for in all. However, in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

(a) The Contract and any amendments thereto, including Change Orders, with those of later date having precedence over those of an earlier date;
(b) The Supplemental General Conditions;
(c) County General Conditions;
(d) Plans and Specifications;
(e) The Solicitation Document, and any addenda thereto.

A.3.2 In the case of an inconsistency between Plans and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance

with the Owner's interpretation in writing as determined in Owners sole discretion.

A.3.3 If the Contractor finds discrepancies in, or omissions from the Contract Documents, or if the Contractor is in doubt as to their meaning, the Contractor shall at once notify the Owner. Matters concerning and interpretation of requirements of the Contract Documents will be decided by the Owner in the Owner's sole discretion, who may delegate that duty in some instances to the Architect/Engineer. Responses to Contractor's requests for interpretation of Contract Documents will be made in writing by Owner (or the Architect/Engineer) within any time limits agreed upon or otherwise with reasonable promptness. Contractor shall not proceed without direction in writing from the Owner (or Architect/Engineer).

A.3.4 References to standard specifications, manuals, codes of any technical society, organization or association, to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws or regulations in effect in the jurisdiction where the Project Site is located on the first published date of the Solicitation Document, except as may be otherwise specifically stated.

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND PROJECT SITE

A.4.1 It is understood that the Contractor, before submitting an Offer, has made a careful examination of the Contract Documents; has become fully informed as to the quality and quantity of materials and the character of the Work required; and has made a careful examination of the location and conditions of the Work and the sources of supply for materials. The Owner will in no case be responsible for any loss or for any unanticipated costs that may be suffered by the Contractor as a result of the Contractor's failure to acquire full information in advance in regard to all conditions pertaining to the Work. No oral agreement or conversation with any officer, agent, or personnel of the Owner, or with the Architect/Engineer either before or after the execution of the Contract, shall affect or modify any of the terms or obligations herein contained. Contractor shall at all times be responsible for all utility locates regardless of the ownership of such utility infrastructure or service.

A.4.2 Should the Plans or Specifications fail to particularly describe the materials, kind of goods, or details of construction of any aspect of the Work, Contractor shall have the duty to make inquiry of the Owner and Architect/Engineer as to what is required prior to performance of the Work. Absent Specifications to the contrary, the materials or processes that would normally be used to produce first quality finished Work shall be considered a part of the Contract requirements.

A.4.3 Any design errors or omissions noted by the Contractor shall be reported promptly to the Owner, including without limitation, any nonconformity with Applicable Laws.

A.4.4 If the Contractor believes that adjustments to cost or Contract Time are involved because of clarifications or instructions issued by the Owner (or Architect/Engineer) in response to the Contractor's notices or requests for information, the Contractor must submit a written request to the Owner, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt by Contractor of the clarifications or instructions issued. If the Owner denies Contractor's request for additional compensation, additional Contract Time, or other relief that Contractor believes results from the clarifications or instructions, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If the Contractor fails to perform the obligations of Sections A.4.1 to A.4.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

A.4.5 If the Contractor believes that adjustments to cost or Contract Time are involved because of an Unavoidable Delay caused by differing Project Site conditions, the Contractor shall notify the Owner immediately of differing Project Site conditions before the area has been disturbed. The Owner will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If Contractor and the Owner agrees that a differing Project Site condition exists, any adjustment to compensation or Contract Time will be determined based on the process set forth in Section D.2.2 for adjustments to or deletions from Work. If the Owner disagrees that a differing Project Site condition exists and denies Contractor's request for additional compensation or Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

A.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under the Contract are those of an independent contractor as defined in ORS 670.600. Contractor represents and warrants that it is not an officer, employee or agent of the Owner as those terms are used in ORS 30.265.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

Contractor represents and warrants that it is not a contributing member of the Public Employees' Retirement System and will be responsible for any federal or state taxes applicable to payment received under the Contract. Contractor will not be eligible for any benefits from these Contract payments of federal Social Security, employment insurance, workers' compensation or the Public Employees' Retirement System, except as a self-employed individual. Unless the Contractor is subject to backup withholding, Owner will not withhold from such payments any amount(s) to cover Contractor's federal or state tax obligations.

A.7 GOVERNMENT EMPLOYMENT STATUS

A.7.1 If this payment is to be charged against federal funds, Contractor represents and warrants that it is not currently employed by the Federal Government. This does not preclude the Contractor from holding another contract with the Federal Government.

SECTION B
ADMINISTRATION OF THE CONTRACT

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

B.1.1 The Owner shall administer the Contract as described in the Contract Documents throughout the term of the Contract, including the one-year period for correction of Work. The Owner will act as provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the Owner may rely on the Architect/Engineer or other agents to perform some or all of these tasks.

B.1.2 The Owner may visit the Project Site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Owner will not make exhaustive or continuous on-Project Site inspections to check the quality or quantity of the Work. Unless otherwise required in a Change Order, the Owner will neither have control over or charge

of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

B.1.3 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the Owner and Contractor shall communicate with each other within a reasonable time frame about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

B.1.4 Based upon the Architect/Engineer's evaluations of the Contractor's Application for Payment, or unless otherwise stipulated by the Owner, the Architect/Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

B.2 CONTRACTOR'S MEANS AND METHODS; MITIGATION OF IMPACTS

B.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the Project Site safety thereof and, except as stated below, shall be fully and solely responsible for the Project Site safety of such means, methods, techniques, sequences or procedures.

B.2.2 The Contractor is responsible to protect and maintain the Work during the course of construction and to mitigate any adverse impacts to the Project, including those caused by authorized changes, which may affect cost, schedule, or quality.

B.2.3 The Contractor is responsible for the actions of all its personnel, laborers, suppliers, agents, and Subcontractors on the Project. The Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of persons who are unfit or unskilled for the tasks assigned to them.

B.3 MATERIALS AND WORKMANSHIP

B.3.1 The intent of the Contract Documents is to provide for the construction and completion of every detail of the Work described. All Work shall be performed in a professional manner and, unless the means or methods of performing a task are specified elsewhere in the Contract Documents, Contractor shall employ methods that are generally accepted and used by the industry, in accordance with industry standards.

B.3.2 The Contractor is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the Contractor's sole expense and within a reasonable time frame.

B.3.3 Work done and materials furnished may be subject to inspection and/or observation and testing by the Owner to determine if they conform to the Contract Documents. Inspection of the Work by the Owner does not relieve the Contractor of responsibility for the Work in accordance with the Contract Documents.

B.3.4 Contractor shall furnish adequate facilities, as required, for the Owner to have safe access to the Work including without limitation walkways, railings, ladders, tunnels, and platforms. Producers, suppliers, and fabricators shall also provide proper facilities and access to their facilities.

B.3.5 The Contractor shall furnish Samples of materials for testing by the Owner and include the cost of the Samples in the Contract Price.

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits, licenses and fees, except for those specifically excluded in the Supplemental General Conditions, as required for the project. Contractor shall be responsible for all violations of the law. Contractor shall give all requisite notices to public authorities.

B.5 COMPLIANCE WITH GOVERNMENT REGULATIONS

B.5.1 Contractor shall comply with Applicable Laws, as amended pertaining to the Work and the Contract. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with the following, as applicable and as may be amended from time to time: (i) Title VI and VII of Civil Rights Act of 1964, as amended; (ii) Section 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Health Insurance Portability and Accountability Act of 1996; (iv) the Americans with Disabilities Act of 1990, as amended; (v) ORS Chapter 659A; as amended; (vi) all regulations and administrative rules established pursuant to any applicable laws; and (vii) all other applicable requirements of federal, state, county or other local government entity statutes, rules and regulations.

B.5.2 Contractor shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations, and

(a) Contractor shall not discriminate against Disadvantaged, Minority, Women or Emerging Small Business enterprises, as those terms are defined in ORS 200.005, or a business enterprise that is owned or controlled by or that employs a disabled veteran, as that term is defined in ORS 408.225, in the awarding of subcontracts.

(b) Contractor shall maintain, in current and valid form, all licenses and certificates required by Applicable Laws or the Contract when performing the Work.

B.5.3 Contractor shall certify that it shall not accept a bid from Subcontractors to perform Work unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.021 at the time they submit their bids to the Contractor.

B.5.4 Contractor shall certify that each landscape contracting business, as defined in ORS 671.520(2), performing Work under the Contract holds a valid landscape construction professional license issued pursuant to ORS 671.560.

B.5.5 The following notice is applicable to Contractors who perform excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (877) 668-4001.

B.5.6 Failure to comply with any or all of the requirements of B.5.1 through B.5.5 shall be a material breach of Contract and constitute grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

B.6 SUPERINTENDENCE

Contractor shall keep on the Project Site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the Owner and who shall represent the Contractor on the Project Site. Directions given to the superintendent by the Owner shall be confirmed in writing to the Contractor.

B.7 INSPECTION

B.7.1 Owner shall have access to the Work at all times.

B.7.2 Inspection of the Work will be made by the Owner at its discretion. The Owner will have authority to reject Work that does not conform to the Contract Documents in the Owner's sole discretion. Any Work found to be not in conformance with the Contract Documents, in the discretion of the Owner, shall be removed and replaced at the Contractor's expense.

B.7.3 Contractor shall make or obtain at the appropriate time all tests, inspections and approvals of portions of the Work required by the Contract Documents or by Applicable Laws or orders of public authorities having jurisdiction. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work. The Contractor shall give the Owner timely notice of when and where tests and inspections are to be made so that the Owner may be present for such procedures. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Owner.

B.7.4 As required by the Contract Documents, Work done or material used without required inspection or testing and/or without providing timely notice to the Owner may be ordered removed at the Contractor's expense.

B.7.5 If directed to do so by Owner or other permitting authority any time before the Work is accepted, the Contractor shall uncover portions of the completed Work for inspection. After inspection, the Contractor shall restore such portions of Work to the standard required by the Contract. If the Work uncovered is unacceptable or was done without required testing or inspection or sufficient notice to the Owner, the uncovering and restoration shall be done at the Contractor's expense. If the Work uncovered is acceptable and was done with sufficient notice to the Owner, the uncovering and restoration will be paid for pursuant to a Change Order.

B.7.6 If any testing or inspection reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Owner's and Architect/Engineer's services and expenses, shall be at the Contractor's expense.

B.7.7 In Owner's sole discretion, it may authorize other interested parties to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner.

B.11 SUBCONTRACTS AND ASSIGNMENT

B.11.1 Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound by the terms and conditions of these General Conditions and Supplemental General Conditions, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor assumes toward the Owner thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by Contractor and approved in writing by Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-subcontractors at any level.

B.11.2 At Owner's request, Contractor shall submit to Owner prior to their execution either Contractor's form of subcontract, or the subcontract to be executed with any particular Subcontractor. If Owner disapproves such form, Contractor shall not execute the form until the matters disapproved are resolved to Owner's satisfaction. Owner's review, comment upon or approval of any such form shall not relieve Contractor of its obligations under this Agreement or be deemed a waiver of such obligations of Contractor.

B.11.3 Contractor shall not assign, sell, or transfer its rights, or delegate its responsibilities under the Contract, in whole or in part, without the prior written approval of the Owner. No such written approval shall relieve Contractor of any obligations of the Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.13 OWNER'S RIGHT TO DO WORK

Owner reserves the right to perform other or additional work at or near the Project Site with other agents than those of the Contractor. If such work takes place within or next to the Project Site, Contractor shall coordinate work with the other contractors or agents, cooperate with all other contractors or forces, carry out the Work in a way that will minimize interference and delay for all agents involved, place and dispose of materials being used so as not to interfere with the operations of another, and join the Work with the work of the others in an acceptable manner and perform it in proper sequence to that of the others. The Owner will resolve any disagreements that may arise between or among Contractor and the other contractors over the method or order of doing all work (including the Work). In case of unavoidable interference, the Owner will establish work priority (including the Work) in the Owner's sole discretion.

B.14 OTHER CONTRACTS

In all cases and at any time, the Owner has the right to execute other contracts related to or unrelated to the Work of the Contract. The Contractor of the Contract shall fully cooperate with any and all other contractors without additional cost to the Owner in the manner described in Section B.13.

B.17 ALLOWANCES

B.17.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

(a) when finally reconciled, allowances shall cover the cost of the Contractor's materials and equipment delivered at the Project Site and all required taxes, less applicable trade discounts;

(b) Contractor's costs for unloading and handling at the Project Site, labor, installation costs, Overhead, profit and other

expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;

(c) whenever costs are more than or less than allowances, the Contract Price shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (i) the difference between actual costs and the allowances under Section B.17.2(a) and (ii) changes in Contractor's costs under Section B.17.2(b);

(d) Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B.18.1 The Contractor shall prepare and keep current, for the Architect's/Engineer's approval (or for the approval of Owner if approval authority has not been delegated to the Architect/Engineer), a schedule and list of submittals which is coordinated with the Contractor's construction schedule and allows the Architect/Engineer reasonable time to review submittals. Owner reserves the right to finally approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples.

B.18.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.

B.18.3 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect/Engineer without action.

B.18.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

B.18.5 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer.

B.18.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's review or approval thereof.

B.18.7 In the event that Owner elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by Owner on the Project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the Owner.

B.19 SUBSTITUTIONS

The Contractor may make Substitutions only with the written consent of the Owner, after evaluation by the Owner and only in accordance with a Change Order. Substitutions shall be subject to the requirements of the Solicitation Document. By making requests for Substitutions, the Contractor represents that the Contractor has personally investigated the proposed substitute product; represents that the Contractor will provide the same warranty for the Substitution that the Contractor would for the product originally specified unless approved otherwise; certifies that the cost data presented is complete and includes all related costs under the Contract including redesign costs, and waives all claims for additional costs related to the Substitution which subsequently become apparent; and will coordinate the installation of the accepted Substitution, making such changes as may be required for the Work to be completed in all respects.

B.20 USE OF PLANS AND SPECIFICATIONS

Plans, Specifications and related Contract Documents furnished to Contractor by Owner or Owner's Architect/Engineer shall be used solely for the performance of the Work under the Contract. Contractor and its Subcontractors and suppliers are authorized to use and reproduce applicable portions of such documents appropriate to the execution of the Work, but shall not claim any ownership or other interest in them beyond the scope of the Contract, and no such interest shall attach. Unless otherwise indicated, all common law, statutory and other reserved rights, in addition to copyrights, are retained by Owner.

SECTION C
WAGES AND LABOR

C.1 PREVAILING WAGE RATES ON PUBLIC WORKS

Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870. Pursuant to ORS 279C.830(1)(d), Contractor shall pay workers at not less than the specified minimum hourly rate of wage, and shall include that requirement in all subcontracts. If the Work is subject to both the state prevailing wage rate law and the federal Davis-Bacon Act, Contractor shall pay the higher of the applicable state or federal prevailing rate of wage. Contractor shall provide written notice to all workers of the number of hours per day and days per week such workers may be required to work.

C.2 PAYROLL CERTIFICATION AND FEE REQUIREMENTS

C.2.1 In accordance with ORS 279C.845, the Contractor and every Subcontractor shall submit written certified statements to the Owner on the form prescribed by the Commissioner of the Bureau of Labor and Industries ("BOLI"), certifying the hourly rate of wage paid each worker which the Contractor or the Subcontractor has employed on the Project and further certifying that no worker employed on the Project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read the certified statement, that the Contractor or Subcontractor knows the contents of the certified statement, and, that to the Contractor's or Subcontractor's best knowledge and belief, the certified statement is true. 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. Certified statements for each week during which the Contractor or Subcontractor has employed a worker on the Project shall be submitted once a month, by the fifth (5^{th}) business day of the following month. The Contractor and Subcontractors shall preserve the certified statements for a period of ten (10) years from the date of completion of the Contract.

C.2.2 Pursuant to ORS 279C.845(7), the Owner shall retain 25 percent of any amount earned by the Contractor on the Project until the Contractor has filed the certified statements required by section C.2.1. The Owner shall pay to the Contractor the amount retained under this subsection within 14 days after the Contractor files the required certified statements, regardless of whether a Subcontractor has failed to file certified statements.

C.2.3 Pursuant to ORS 279C.845(8), the Contractor shall retain 25 percent of any amount earned by a first-tier Subcontractor on this Project until the first-tier Subcontractor has filed with the Owner the certified statements required by C.2.1. Before paying any amount retained under this subsection, the Contractor shall verify that the first-tier Subcontractor has filed the certified statement. Within 14 days after the first-tier Subcontractor files the required certified statement the Contractor shall pay the first-tier Subcontractor any amount retained under this subsection.

C.2.4 In accordance with statutory requirements and administrative rules promulgated by the Commissioner of the Bureau of Labor and Industries, the fee required by ORS 279C.825(1) will be paid by Owner to the Commissioner.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

C.3.1 As a condition to Owner's performance hereunder, the Contractor shall:

C.3.1.1 Make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in the Contract.

C.3.1.2 Pay all contributions or amounts due the State Industrial Accident Fund or successor program from such Contractor or Subcontractor incurred in the performance of the Contract.

C.3.1.3 Not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished. Contractor will not assign any claims that Contractor has against Owner, or assign any sums due by Owner, to Subcontractors, suppliers, or manufacturers, and will not make any agreement or act in any way to give Subcontractors a claim or standing to make a claim against the Owner.

C.3.1.4 Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

C.3.2 As a condition to Owner's performance hereunder, if Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor of a Subcontractor by any person in connection with the Project as such claim becomes due, the proper officer(s) representing the Owner may pay the claim and charge the amount of the payment against funds due or to become due Contractor under the Contract. Payment of claims in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.

C.3.3 Contractor shall include in each subcontract for property or services entered into by the Contractor and a first-tier subcontractor, including a material supplier, for the purpose of performing a construction contract, a payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within ten (10) Days out of such amounts as are paid to the Contractor by the Owner under such contract.

C.3.4 All employers, including Contractor, that employ subject workers who work under the Contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

C.4 PAYMENT FOR MEDICAL CARE

As a condition to Owner's performance hereunder, Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of the Contractor, of all sums of which 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.

C.5 HOURS OF LABOR

As a condition to Owner's performance hereunder, no person shall be employed to perform Work under the Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

(a) For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive Days, Monday through Friday; or

(b) For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive Days, Monday through Friday; and

(c) For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

This Section C.5 will not apply to Contractor's Work under the Contract to the extent Contractor is currently a party to a collective bargaining agreement with any labor organization.

This Section C.5 shall not excuse Contractor from completion of the Work within the time required under the Contract.

SECTION D
CHANGES IN THE WORK

D.1 CHANGES IN WORK

D.1.1 The terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever, without prior written agreement and then only after any necessary approvals have been obtained. A Change Order is required to modify the Contract, which shall not be effective until its execution by the parties to the Contract and all approvals required by public contracting laws have been obtained.

D.1.2 It is mutually agreed that changes in Plans, quantities, or details of construction may be necessary or desirable during the course of construction. Within the general scope of the Contract, the Owner may at any time, without notice to the sureties and without impairing the Contract, require changes it deems necessary or desirable within the scope of this Project and consistent with this Section D.1. All changes to the Work shall be documented and Change Orders shall be executed under the conditions of the Contract Documents. Such changes may include, but are not limited to:

(a) Modification of specifications and design.
(b) Increases or decreases in quantities.
(c) Increases or decreases to the amount of Work.
(d) Addition or elimination of any Work item.
(e) Change in the duration of the Project.
(f) Acceleration or delay in performance of Work.
(g) Deductive changes.

Deductive changes are those that reduce the scope of the Work, and shall be made by mutual agreement whenever feasible. In cases of suspension or partial termination under Section J, Owner reserves the right to unilaterally impose a deductive change and to self-perform such Work, for which the provisions of Section B.13 (Owner's Right to Do Work) shall then apply. Adjustments in compensation shall be made under Section D.1.3, in which costs for deductive changes shall be based upon a Direct Costs adjustment together with the related percentage markup specified for profit, Overhead and other indirect costs, unless otherwise agreed to by Owner.

D.1.3 The Owner and Contractor agree that adjustments to or deletions from the Work shall be administered and compensated according to the following:

(a) Unit Pricing: Unit pricing may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for adjustments to Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the adjustment to Work.

(b) Fixed Fee: If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, fixed pricing may be used for adjustments to or deletions from the Work. In fixed pricing, the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. Notwithstanding the foregoing, the mark-ups set forth in Section D.1.3(c) shall be utilized in establishing fixed pricing, and such mark-ups shall not be exceeded. Cost and price data relating to adjustments to or deletions from the Work shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.

(c) Time and Material: In the event that unit pricing and fixed pricing are not utilized, then adjustments to or deletions from the Work shall be performed on a cost reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. The Contractor or Subcontractor who performs the Work shall be allowed to add up to ten percent (10%) markup to the Direct Costs as full compensation for profit, Overhead and other indirect costs for Work performed with the Contractor's or Subcontractor's own agents

Each ascending tier Subcontractor or the Contractor that did not perform the Work, will be allowed to add up to five percent (5%) supplemental markup on the Direct Costs of the Work (but not the above allowable markups) covered by a Change Order. No additional markup shall be permitted for any third tier or greater descending Subcontractor.

Example: $20,000 of Direct Costs Work performed by a 2nd Tier Subcontractor

	Markup	Allowed Total Fee Plus Markup
General Contractor	5%	$1,000.00
1st Tier Sub Contractor	5%	$1,000.00
2nd Tier Sub Contractor	10%	$22,000.00

(d) Payments made to the Contractor shall be complete compensation for Overhead, profit, and all costs that were incurred by the Contractor or by other agents furnished by the Contractor, including Subcontractors, for adjustments to or deletions from the Work pursuant to a Change Order. Owner may establish a maximum cost for additional Work under this Section D.1.3, which shall not be exceeded for reimbursement without additional written authorization from Owner in the form of a Change Order. Contractor shall not be required to complete such additional Work without additional authorization.

D.1.4 Any necessary adjustment of Contract Time that may be required as a result of adjustments to or deletions from the Work must be agreed upon by the parties before the start of the revised Work unless Owner authorizes Contractor to start the revised Work before agreement on Contract Time adjustment.

Contractor shall submit any request for additional compensation (and additional Contract Time if Contractor was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of Owner's request for additional Work . If Contractor's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) Day time limit, Contractor's requests pertaining to that additional Work shall be barred. The thirty (30) Day time limit for making requests shall not be extended for any reason, including without limitation Contractor's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by Owner. If the Owner denies Contractor's request for additional compensation or adjustment of Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

D.1.5 If any adjustment to Work under Section D.1.3 causes an increase or decrease in the Contractor's cost of, or the Contract Time required for the performance of any other part of the Work under the Contract, Contractor shall submit a written request to the Owner, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of Owner's request for adjustments to or deletions from the Work by Contractor.

The thirty (30) Day time limit applies to claims of Subcontractors, suppliers, or manufacturers who may be affected by Owner's request for adjustments to or deletions from the Work and who request additional compensation or an extension of Contract Time to perform; Contractor has responsibility for contacting its Subcontractors, suppliers, or manufacturers within the thirty (30) Day time limit, and including their requests with Contractor's requests. If the request involves Work to be completed by Subcontractors, or materials to be furnished by suppliers or manufacturers, such requests shall be submitted to the Contractor in writing with full analysis and justification for the adjustments to compensation and Contract Time requested. The Contractor shall analyze and evaluate the merits of the requests submitted by Subcontractors, suppliers, and manufacturers to Contractor prior to including those requests and Contractor's analysis and evaluation of those requests with Contractor's requests for adjustments to compensation or Contract Time that Contractor submits to the Owner. Failure of Subcontractors, suppliers, manufacturers or others to submit their requests to Contractor for inclusion with Contractor's requests submitted to Owner within the time period and by the means described in this section shall constitute a waiver of these Subcontractor claims. The Owner will not consider direct requests or claims from Subcontractors, suppliers, manufacturers or others not a party to the Contract. The consideration of such requests and claims under this section does not give any Person, not a party to the Contract the right to bring a claim against Owner, whether in this claims process, in litigation, or in any dispute resolution process.

If the Owner denies the Contractor's request for adjustment to compensation or Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

D.1.6 No request or Claim by the Contractor for additional costs or an adjustment of Contract Time shall be allowed if made after receipt of final payment application under the Contract. Final payment application must be made by Contractor within the time required under Section E.6.4.

D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The Contractor agrees that it will work in good faith with Owner to undertake changes, when agreed upon by execution of a Change Order. Each change will be evaluated for extension of Contract Time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

D.2.1 Contractor shall not be entitled to additional compensation or additional Contract Time for Avoidable Delays.

D.2.2 In the event of Unavoidable Delays, Contractor may be entitled to the following:

(a) Contractor may be entitled to additional compensation or additional Contract Time, or both, for Unavoidable Delays described in Section D.2.1.2 (a) and (b).

(b) Contractor may be entitled to additional Contract Time for Unavoidable Delays described in Section D.2.1.2(c) and (d).

In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.2 for Unavoidable Delays, other than requests for additional compensation or additional Contract Time for differing Project Site conditions for which a review process is established under Section A.4.5, Contractor shall submit a written notification of the delay to the Owner within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the Project components impacted by the delay, and the anticipated additional Contract Time extension or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay. If the Owner denies Contractor's request for additional compensation or adjustment of Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

If Contractor does not timely submit the notices required under this Section D.2, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

D.3.1 All Contractor Claims shall be referred to the Owner for review. Contractor's Claims, including Claims for adjustments to compensation or Contract Time, shall be submitted in writing by Contractor to the Owner within five (5) Days after a denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, provided that such initial request has been submitted in accordance with the requirements and within the time limits established in these County General Conditions. Within thirty (30) Days after the initial Claim, Owner shall receive from Contractor a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be barred.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by Contractor and shall include all information, records and documentation necessary for the Owner to properly and completely evaluate the claim, including, but not limited to a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the Contract Time adjustment requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the Contractor will analyze and evaluate the merits of the Subcontractor claim prior to forwarding it and that analysis and evaluation to the Owner. The Owner will not consider direct claims from Subcontractors, suppliers, manufacturers, or others not a party to the Contract. Contractor agrees that it will make no agreement, covenant, or assignment, nor will it commit any other act that will permit or assist any Subcontractor, supplier, manufacturer, or other to directly or indirectly make a claim against Owner.

D.3.3 The Owner, through the Architect/Engineer (or other employee or agent assigned by the Owner) will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) recommend approval of all or part of the Claim; (5) arrange a meeting with the Contractor for formal review of the Claim; or (6) propose an alternate resolution.

D.3.4 Once the Engineer or Project Manager determines the Owner is in receipt of a properly submitted claim, the Engineer or Project Manager may arrange a meeting, as agreed by the parties, with the Contractor in order to present the claim for formal review and discussion. A person authorized by the Contractor to execute Change Orders on behalf of the Contractor must be present and attend all claim meetings.

D.3.5 The Owner's decision, through the Architect/Engineer (or other employee or agent assigned by the Owner), shall be final and binding on the Contractor unless appealed by written notice to the Owner within fifteen (15) Days of receipt of the decision. The Contractor must present written documentation supporting the Claim within fifteen (15) Days of the notice of appeal. After receiving the appeal documentation, the Owner, through the appropriate department director, shall review the materials and render a decision within thirty (30) Days after receiving the appeal documents.

D.3.6 If, at any step in the claim decision or review process, the Contractor fails to promptly submit requested information or documentation that the Owner deems necessary to analyze the claim, the Contractor is deemed to have waived its right to further review, and the Claim will not be considered properly filed and preserved.

D.3.7 Both parties agree to exercise their best efforts in good faith to resolve all disputes within sixty (60) Days of the issuance of the appeal in Section D. 3.4 above. If the parties are unable to resolve their issues through mediation or otherwise, either party may seek redress through all available remedies in equity or in law.

D.3.8 Unless otherwise directed by Owner, Contractor shall proceed with the Work while any Claim, or mediation or litigation arising from a Claim, is pending. Regardless of the review period or the final decision of the Owner, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or allowed to cease or delay Work, in whole or in part, without a written stop work order from the Owner.

SECTION E
PAYMENTS

E.1 SCHEDULE OF VALUES

The Contractor shall submit, by or before the pre-construction conference (as described in Section H.1.3), a schedule of values ("Schedule of Values") for the Contract Work. This schedule shall provide a breakdown of values for the Contract Work and will be the basis for progress payments. The breakdown shall demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner, Contractor shall revise the schedule of values and resubmit the same for approval of Owner.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses, in accordance with the requirements of this Section E.2 and ORS 279C.570. Applications for payment shall be based upon estimates of Work completed and the Schedule of Values. As a condition precedent to Owner's obligation to pay, all applications for payment shall be approved by the Owner. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest in accordance with ORS 279C.570 for overdue invoices, not including retainage, due the Contractor. Overdue invoices will be those that have not been paid within the earlier of:

(a) Thirty (30) days after receipt of the invoice; or

(b) Fifteen (15) days after the payment is approved by the County.

Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Payment of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor.

Owner reserves the right, instead of requiring the Contractor to correct or resubmit a defective or improper application for payment, to reject the defective or improper portion of the application for payment and pay the remainder of the application for such amounts which are correct and proper.

Owner, upon written notice to the Contractor, may elect to make payments to the Contractor only by means of Electronic Funds Transfers ("EFT") through Automated Clearing House ("ACH") payments. If Owner makes this election, the Contractor shall arrange for receipt of the EFT/ACH payments.

E.2.2 Contractor shall submit to the Owner an application for each payment and, if required, receipts or other vouchers showing payments for materials and labor including payments to Subcontractors. Contractor shall include in its application for payment a schedule of the percentages of the various parts of the Work completed, based on the Schedule of Values which shall aggregate to the payment application total, and shall include, on the face of each copy thereof, a certificate in substantially the following form:

"I, the undersigned, hereby certify that the above bill is true and correct, and the payment therefore, has not been received.

Signed: _____
Dated: _____"

E.2.3 Generally, applications for payment will be accepted only for materials that have been installed. Under special conditions, applications for payment for stored materials will be accepted at Owner's sole discretion. Such a payment, if made, will be subject to the following conditions:

(a) The request for stored material shall be submitted at least thirty (30) Days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.

(b) The Contractor shall submit applications for payment showing the quantity and cost of the material stored.

(c) The material shall be stored in a bonded warehouse and Owner shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.

(d) The Contractor shall name the Owner as co-insured on the insurance policy covering the full value of the property while in the care and custody of the Contractor until it is installed. A certificate noting this coverage shall be issued to the Owner.

(e) Payments shall be made for materials and equipment only. The submitted amount in the application for payment shall be reduced by the cost of transportation from the storage site to the Project Site and for the cost of an inspector to verify delivery and condition of the goods at the storage site. The cost of storage and inspection shall be borne solely by the Contractor.

(f) Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the

material and/or equipment stored and of payment for the storage site.

(g) Payment for stored materials and/or equipment shall in no way indicate acceptance of the materials and/or equipment or waive any rights under the Contract for the rejection of the Work or materials and/or equipment not in conformance with the Contract Documents.

(h) All required documentation shall be submitted with the respective application for payment.

E.2.4 The Owner reserves the right to withhold all or part of a payment, or may nullify in whole or part any payment previously made, to such extent as may be necessary in the Owner's opinion to protect the Owner from loss because of:

(a) Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with Applicable Laws or the Contract Documents;

(b) third party claims filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the Owner is provided by the Contractor;

(c) failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Contractor and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2);

(d) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

(e) damage to the Work, Owner or Owner's agent;

(f) reasonable evidence that the Work will not be completed within the Contract Time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

(g) failure to carry out the Work in accordance with the Contract Documents; or

(h) assessment of liquidated damages, when withholding is made for offset purposes.

E.2.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

(a) Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5. Pending final determination of cost to the Owner of changes in the Work, no amounts for changes in the Work can be included in applications for payment until the Contract Price has been adjusted by a Change Order;

(b) Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the Project Site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the Project Site at a location agreed upon in writing), less retainage as provided in Section E.5;

(c) Subtract the aggregate of previous payments made by the Owner; and

(d) Subtract any amounts for which the Owner has withheld or nullified payment as provided in the Contract Documents.

E.2.6 Contractor's applications for payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier.

E.2.7 The Contractor warrants to Owner that title to all Work covered by an application for payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an application for payment all Work for which payments are received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided financing, labor, materials and equipment relating to the Work.

E.2.8 If Contractor disputes any determination by Owner with regard to any application for payment, Contractor nevertheless shall continue to expeditiously perform the Work. No payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or shall relieve Contractor of any of its obligations hereunder.

E.3 PAYROLL CERTIFICATION REQUIREMENT

Owner's receipt of payroll certification pursuant to Section C.2 of the Contract shall be a condition precedent to Owner's obligation to pay any progress payments or final payment otherwise due.

E.4 DUAL PAYMENT SOURCES

Contractor shall not be compensated for Work performed under the Contract from any state agency other than the agency that is a party to the Contract.

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with the requirements set forth in Local Contract Review Board Rules or the applicable County standard.

E.5.1.1 Owner may reserve as retainage from any progress payment in an amount not to exceed five percent of the payment. As Work progresses, Owner may reduce the amount of retainage on or may eliminate retainage on any remaining monthly Contract payments after fifty (50) percent of the Work under the Contract is completed if, in the Owner's discretion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is ninety-seven and a half percent (97.5%) completed in Owner's estimation, the Owner may, at its discretion and without application by the Contractor, reduce the retained amount to hundred (100) percent of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E.5.1.2 Contractor may request in writing:

(a) to be paid amounts which would otherwise have been retained from progress payments where Contractor has deposited acceptable bonds and securities of equal value with Owner or in a custodial account or other mutually agreed account satisfactory to Owner, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of Owner;

(b) for construction projects over $1,000,000, that retainage be deposited in an interest bearing account, established through the County Treasurer for county agencies, in a bank, savings bank, trust company or savings association for the benefit of Owner, with earnings from such account accruing to the Contractor; or

(c) that the Owner allow Contractor to deposit a surety bond for the benefit of Owner, in a form acceptable to Owner, in lieu of all or a portion of funds retained, or to be retained. Such bond and any proceeds therefrom shall be made subject to all claims in the manner and priority as set forth for retainage.

When the Owner has accepted the Contractor's election of option (a) or (b), Owner may recover from Contractor any additional costs incurred through such election by reducing Contractor's final payment. Where the Owner has agreed to Contractor's request for option (c), Contractor shall accept like bonds from Subcontractors and suppliers on the Project from which Contractor has required retainages.

E. 5.1.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price. The Owner shall pay to Contractor interest at the rate of two thirds of one percent per month on the final payment due Contractor, interest to commence forty-five (45) Days after the date which Owner receives Contractor's final approved application for payment and Work under the Contract has been completed and accepted and to run until the date when final payment is tendered to Contractor. The Contractor shall notify Owner in writing when the Contractor considers the Work complete and deliver to Owner its final application for payment and Owner shall, within fifteen (15) Days after receiving the written notice and the application for payment, either accept the Work or notify the Contractor of Work yet to be performed on the Contract. If Owner does not within the time allowed notify the Contractor of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run forty-five (45) Days after the end of the fifteen (15) Day period.

E.5.1.4 Owner will reduce the amount of the retainage if the Contractor notifies the Owner that the Contractor has deposited in an escrow account with a bank or trust company, in a manner authorized by the Owner, bonds and securities of equal value of a kind approved by the Owner and such bonds and securities have in fact been deposited.

E.5.1.5 Contractor agrees that if Contractor elects to reserve a retainage from any progress payment due to any Subcontractor or supplier, such retainage shall not exceed five percent of the payment, and such retainage withheld from Subcontractors and suppliers shall be subject to the same terms and conditions stated in Subsection E.5 as apply to Owner's retainage from any progress payment due to Contractor.

E.6 FINAL PAYMENT

E.6.1 Upon completion of all the Work under the Contract, the Contractor shall notify the Owner, in writing, that Contractor has completed Contractor's obligations under the Contract and shall prepare its application requesting final payment. The amount of final payment will be the difference between the total amount due the Contractor pursuant to the Contract Documents and the sum of all payments previously made. Upon receipt of such notice and application for payment, the Owner will inspect the Work, and, if acceptable, submit to Contractor a recommendation as to acceptance of the completed Work and the final estimate of the amount due the Contractor. If the Work is not acceptable, Owner will notify Contractor within fifteen (15) Days of Contractor's request for final payment. Upon approval of this final application for payment by the Owner and compliance by the Contractor with provisions in Section K, and Contractor's satisfaction of other provisions of the Contract Documents as may be applicable, the Owner shall pay to the Contractor all monies due under the provisions of these Contract Documents.

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner (1) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the Owner, (2) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (3) consent of surety, if any, to final payment and (4), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien.

E.6.3 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

E.6.4 Contractor agrees to submit its final payment application within ninety (90) Days after Substantial Completion, unless written extension is granted by Owner. Contractor shall not delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to the Contract, or lack of resolution of a dispute with Owner or any other person of matters arising out of or relating to the Contract. If Contractor fails to submit its final payment application within ninety (90) Days after Substantial Completion, and Contractor has not obtained written extension by Owner, all requests or Claims for additional costs or an extension of Contract Time shall be barred.

SECTION F
PROJECT SITE CONDITIONS

F.1 USE OF PREMISES

Contractor shall confine equipment, storage of materials and operation of Work to the limits indicated by Contract Documents, Applicable Laws, permits or directions of the Owner. Contractor shall follow the Owner's instructions regarding use of premises, if any.

F.2 PROTECTION OF WORKERS, PROPERTY AND THE PUBLIC

F.2.1 Contractor shall maintain continuous and adequate protection of all of the Work from damage and shall protect the Owner, workers and property from injury or loss arising in connection with the Contract. Contractor shall remedy acceptably to the Owner any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the Owner. Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

F.2.2 Contractor shall take all necessary precautions for the safety of all personnel on the Project Site or otherwise engaged in the undertaking of the Work and shall comply with the Contract Documents, best practices and all applicable provisions of federal,

state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. Contractor shall designate a responsible employee or associate on the Project Site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the Owner. The Owner has no responsibility for Project Site safety. Project Site safety shall be the responsibility of the Contractor.

F.2.3 Contractor shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. Contractor shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto. In the event the Contractor damages any property, the Contractor shall at once notify the property owner and make, or arrange to make, full restitution. Contractor shall, immediately and in writing, report to the Owner, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.

F.2.4 Contractor shall be responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, vehicles and materials on the Project Site.

F.2.5 Contractor shall at all times direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials shall be conducted so no release will occur that may pollute or become hazardous.

F.2.6 In an emergency affecting the safety of life or limb or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the Owner. Any compensation claimed by the Contractor on account of emergency work shall be determined in accordance with section D.

F.2.7 Contractor shall comply with all Owner safety rules and regulations, if applicable. Prior to commencement of any Work, Contractor and Subcontractors shall be required to complete an Owner Contractor Safety Orientation and submit all Owner required safety plans.

F.2.8 Contractor shall demonstrate that an employee drug testing program is in place.

F.3 CUTTING AND PATCHING

F.3.1 If applicable, Contractor shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other contractors or Subcontractors shown upon, or reasonably implied by, the Contract Documents.

F.3.2 If applicable, Contractor shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then Contractor shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.

F.4 CLEANING UP

From time to time as may be prudent or ordered by the Owner and, in any event, immediately after completion of the Work, the Contractor shall, at its own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work. If Contractor fails to do so within twenty-four (24) hours after notification by the Owner the work may be done by others and the cost charged to the Contractor and deducted from payment due the Contractor.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1. Contractor shall be held responsible for and shall indemnify, defend (with counsel of Owner's choice), and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Work or Contractor's obligations under the Contract which occur as a result of, or are contributed by, the negligence or actions of Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit Contractor's responsibility for obtaining insurance coverages required under Section G.3 of the Contract, and Contractor shall take no action that would void or impair such coverages.

F.5.1.1 Contractor agrees to promptly dispose of such spills, releases, discharge or leaks to the satisfaction of Owner and regulatory agencies having jurisdiction in a manner that complies with Applicable Laws. Cleanup shall be at no cost to the Owner and shall be performed by properly qualified and, if applicable, licensed personnel.

F.5.1.2 Unless otherwise approved in the Solicitation Document, Contractor shall obtain the Owner's written consent prior to bringing onto the Project Site any (i) environmental pollutants or (ii) hazardous substances or materials, as the same or reasonably similar terms are used in any Applicable Laws. In any event, Contractor shall provide prior written notice to Owner when hazardous materials are brought on to the Project Site. The Contractor, at all times, shall:

(a) properly handle, use and dispose of all environmental pollutants and hazardous substances or materials on the Project Site, in accordance with all Applicable Laws;

(b) be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought onto the Project Site; and

(c) promptly clean up and remediate, without cost to the Owner, such spills, releases, discharges, or leaks to the Owner's satisfaction and in compliance with all Applicable Laws.

F.5.2 Contractor shall report all reportable quantity releases, as such releases are defined in Applicable Laws. Upon discovery, regardless of quantity, Contractor must verbally report all releases to the Owner in a prompt manner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

(a) Description of items released (identity, quantity, manifest numbers, and any and all other documentation required by law).

(b) Whether amount of items released is EPA/DEQ reportable, and, if so, when reported.

(c) Exact time and location of release, including a description of the area involved.

(d) Containment procedures initiated.

(e) Summary of communications about the release between Contractor and State, local or federal officials other than Owner. Any communication to the press will be done by Owner and Contractor will defer to Owner.

(f) Description of cleanup procedures employed or to be employed at the Project Site, including disposal location of spill residue.

(g) Personal injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

F.6.1 Unless disposition of environmental pollution is specifically a part of the Contract, or was caused by the Contractor (reference F.5 Environmental Contamination), Contractor shall immediately notify Owner of any hazardous substance(s) which Contractor discovers or encounters during performance of the Work required by the Contract. "Hazardous substance(s)" means any hazardous, toxic and radioactive materials and those substances defined as "hazardous substances," "hazardous materials," "hazardous wastes," "toxic substances," or other similar designations in any federal, state, or local law, regulation, or ordinance, including without limitation asbestos, polychlorinated biphenyl ("PCB"), or petroleum, and any substances, materials or wastes regulated by 40 CFR, Part 261 and defined as hazardous in 40 CFR S 261.3. In addition to notifying Owner of any hazardous substance(s) discovered or encountered, Contractor shall immediately cease working in any particular area of the Project where a hazardous substance(s) has been discovered or encountered if continued work in such area would present a risk or danger to the health or wellbeing of Contractor's or any Subcontractor's work force, property or the environment.

F.6.2 Upon being notified by Contractor of the presence of hazardous substance(s) on the Project Site, not brought on to the Project Site by Contactor, Owner shall arrange for the proper disposition of such hazardous substance(s).

SECTION G
INDEMNITY, BONDING, AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

G.1.1 Contractor shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay that may be caused by, or result from, the carrying out of the Work to be done under the Contract, or from any act, omission or neglect of the Contractor, its Subcontractors, employees, guests, visitors, invitees and agents.

G.1.2 To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by Owner) and hold harmless the Owner and its elected officials, officers, directors, agents, and employees (collectively "Indemnitees") from and against all liabilities, damages, losses, claims, expenses, demands and actions of any nature whatsoever which arise out of, result from or are related to: (a) any damage, injury, loss, expense, inconvenience or delay described in this Section G.1; (b) any accident or occurrence which happens or is alleged to have happened in or about the Project Site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects; (c) any failure of the Contractor to observe or perform any duty or obligation under the Contract Documents which is to be observed or performed by the Contractor, or any breach of any agreement, representation or warranty of the Contractor contained in the Contract Documents or in any subcontract; (d) the negligent acts or omissions of the Contractor, a Subcontractor or anyone directly or indirectly employed by them or any one of them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder (except to the extent otherwise void under ORS 30.140); and (e) any lien filed upon the Project or bond claim in connection with the Work. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section G.1.2.

G.1.3 In claims against any person or entity indemnified under Section G.1.2 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section G.1.2 shall not be limited on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

G.2 PERFORMANCE AND PAYMENT SECURITY; PUBLIC WORKS BOND

G.2.1 When the Contract Price is $50,000 or more, the Contractor shall furnish and maintain in effect at all times during the Contract Period a performance bond in a sum equal to the Contract Price and a separate payment bond also in a sum equal to the Contract Price. Contractor shall furnish such bonds even if the Contract Price is less than the above thresholds if otherwise required by the Contract Documents.

G.2.2 Bond forms furnished by the Owner and notarized by Contractor's surety company authorized to do business in Oregon are the only acceptable forms of performance and payment security, unless otherwise specified in the Contract Documents.

G.2.3 Before execution of the Contract, the Contractor shall file with the Construction Contractors Board, and maintain in full force and effect, the separate public works bond required by Oregon Revised Statutes, Chapter 279C.830 and 279C.836, unless otherwise exempt under those provisions. The Contractor shall also include in every subcontract a provision requiring the Subcontractor to have a public works bond filed with the Construction Contractors Board before starting Work, unless otherwise exempt, and shall verify that the Subcontractor has filed a public works bond before permitting any Subcontractor to start Work.

G.3 INSURANCE

G.3.1 Primary Coverage: Insurance carried by Contractor under the Contract shall be the primary coverage. The coverages indicated are minimums unless otherwise specified in the Contract Documents.

G.3.2 Workers' Compensation: All employers, including Contractor, that employ subject workers who work under the Contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than the minimum amount required by statute for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation coverage by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 Builder's Risk Insurance:

G.3.3.1 Builder's Risk: During the term of the Contract, for new construction the Contractor shall obtain and keep in effect

Builder's Risk insurance on an all risk forms, including earthquake and flood, for an amount equal to the full amount of the Contract, plus any changes in values due to modifications, Change Orders and loss of materials added. Such Builder's Risk shall include, in addition to earthquake and flood, theft, vandalism, mischief, collapse, transit, debris removal, and architect's fees "soft costs" associated with delay of Project due to insured peril. Any deductible shall not exceed $50,000 for each loss, except the earthquake and flood deductible which shall not exceed 2 percent of each loss or $50,000, whichever is greater. The deductible shall be paid by Contractor. The policy will include as loss payees Owner, the Contractor and its Subcontractors as their interests may appear.

G.3.3.2 Builder's Risk Installation Floater: For Work other than new construction, Contractor shall obtain and keep in effect during the term of the Contract, a Builder's Risk Installation Floater for coverage of the Contractor's labor, materials and equipment to be used for completion of the Work performed under the Contract. The minimum amount of coverage to be carried shall be equal to the full amount of the Contract. The policy will include as loss payees Owner, the Contractor and its Subcontractors as their interests may appear. Owner may waive this requirement at its sole and absolute discretion.

G.3.3.3 Such insurance shall be maintained until Owner has occupied the facility.

G.3.3.4 A loss insured under the Builder's Risk insurance shall be adjusted by the Owner and made payable to the Owner as loss payee. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner. The Owner shall have power to adjust and settle a loss with insurers.

G.3.4 General Liability Insurance:

G.3.4.1 Commercial General Liability: Upon execution of a Contract, Contractor shall obtain, and keep in effect at Contractor's expense for the term of the Contract, Commercial General Liability Insurance ("CGL") covering bodily injury and property damage in the amount of not less than $1,000,000 per claim and $2,000,000 per occurrence in a form satisfactory to Owner. This insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnities provided under the Contract (to the extent contractual liability coverage for the indemnity is available in the marketplace), and shall be issued on an occurrence basis written on ISO Form GC 00 01 (12 04 or later) or an equivalent form approved in advance by Owner. The CGL shall provide separation of insured language. The policy or policies obtained by Contractor for purposes of fulfilling the requirements of this section shall be primary insurance with respect to the Owner. Any insurance or self-insurance maintained by the County shall be excess and shall not contribute to it.

G.3.4.2 Automobile Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the Contract, Automobile Liability Insurance covering owned, and/or hired vehicles, as applicable. The coverage may be written in combination with the Commercial General Liability Insurance. Contractor shall provide proof of insurance of not less than $1,000,000 per claim and $2,000,000 per occurrence. Contractor and its Subcontractors shall be responsible for ensuring that all non-owned vehicles maintain adequate Automobile Liability insurance while on Project Site.

G.3.4.3 Owner may adjust the insurance amounts required in Section G.3.4.1 and G.3.4.2 based upon institution specific risk assessments through the issuance of Supplemental General Conditions and a Contract.

G.3.4.4 To the extent that the Contract Documents require the Contractor to provide professional design services, design-build, or certifications related to systems, materials, or equipment, the Contractor shall (1) purchase and maintain professional liability/errors-and-omissions insurance with limits of not less than $1,000,000 for each claim and $2,000,000 general annual aggregate and (2) cause those Subcontractors (of any tier) who are providing professional design services including any design-build services to procure and maintain professional liability/errors-and-omissions insurance with limits of not less than $1,000,000 for each claim and $2,000,000 general annual aggregate. This policy shall be for the protection of the Owner, its elected officials, officers, agents and employees against liability for damages because of personal injury, bodily injury, death, or damage to property, including loss of use thereof, and damages because of negligent acts, errors and omissions in any way related to the Contract. The Owner, at its option, may require a complete copy of the above policy.

G.3.4.5 "Tail" Coverage: If any of the required liability insurance is arranged on a "claims made" basis, "tail" coverage will be required at the completion of the Contract for a duration of 36 months or the maximum time period available in the marketplace if less than 36 months. Contractor shall furnish certification of "tail" coverage as described or continuous "claims made" liability coverage for 36 months following Final Completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage, provided its retroactive date is on or before the effective date of the Contract. Owner's receipt of the policy endorsement evidencing such coverage shall be a condition precedent to Owner's obligation to make final payment and to Owner's final acceptance of Work or services and related warranty (if any).

G.3.4.6 Umbrella Liability (if required by Owner through issuance of Supplemental General Conditions): Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the Contract, Umbrella liability Insurance over and above the general liability, automobile liability and workers' compensation coverage if required by Owner in specified limits at time of requirement.

G.3.4.7 Pollution Liability may be required by Owner through issuance of Supplemental General Conditions.

G.3.5 Additional Insured: The general liability insurance coverage, automobile liability, umbrella, and pollution liability if required, shall include the Owner as additional insureds but only with respect to the Contractor's activities to be performed under the Contract. The additional-insured endorsement for CGL insurance must be written on ISO Form CG 20 10 (10 01) and CG 20 37 (10 01), or their equivalent, but shall not use either of the following forms: CG 20 10 (10 93) or CG 20 10 (03 94). Proof of insurance must include a copy of the endorsement showing "Clackamas County, its elected officials, agents, officers, and employees" as scheduled insureds.

If Contractor cannot obtain an insurer to name the Owner as additional insureds, Contractor shall obtain at Contractor's expense, and keep in effect during the term of the Contract, Owners and Contractors Protective Liability Insurance, naming the Owner as additional insureds with not less than a $2,000,000 limit per occurrence. This policy must be kept in effect for 36 months following Final Completion. As evidence of coverage, Contractor shall furnish the actual policy to Owner prior to execution of the Contract.

G.3.6 Notice of Cancellation or Change: If the Contractor receives a non-renewal or cancellation notice from an insurance carrier affording coverage required herein, or receives notice that coverage no longer complies with the insurance requirements herein, Contractor agrees to notify Owner by fax within five (5) business days with a copy of the non-renewal or cancellation notice, or written specifics as to which coverage is no longer in compliance. When notified by Owner, the Contractor agrees to stop Work pursuant to the Contract at Contractor's expense, unless all required insurance remain in effect. Any failure to comply with the reporting provisions of this insurance, except for the potential exhaustion of aggregate limits, shall not affect the coverages provided to the Owner and its institutions, divisions, officers, and employees.

Owner shall have the right, but not the obligation, of prohibiting Contractor from entering the Project Site until a new certificate(s) of insurance is provided to Owner evidencing the replacement coverage. The Contractor agrees that Owner reserves the right to withhold payment to Contractor until evidence of reinstated or replacement coverage is provided to Owner.

G.3.7 Certificate(s) of Insurance/Insurance Carrier Qualification: As evidence of the insurance coverage required by the Contract, the Contractor shall furnish certificate(s) of insurance to the Owner prior to execution of the Contract. The certificate(s) will specify all of the parties who are additional insureds or loss payees for the Contract. A renewal certificate shall be sent to Owner at least 10 days prior to coverage expiration. Insurance coverage required under the Contract shall be obtained from insurance companies or entities acceptable to the Owner and that are eligible to provide such insurance under Oregon law. Eligible insurers include admitted insurers that have been issued a certificate of authority from the Oregon Department of Consumer and Business Services authorizing them to conduct an insurance business and issue policies of insurance in the state of Oregon, and certain non-admitted surplus lines insurers that satisfy the requirements of applicable Oregon law and which are subject to approval by the Owner. The Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self-insurance included hereunder. Any deductible, self-insured retention and/or self-insurance in excess of $50,000 shall be subject to approval by the Owner in writing and shall be a condition precedent to the effectiveness of any Contract.

SECTION H
SCHEDULE OF WORK

H.1 CONTRACT PERIOD

H.1.1 Time is of the essence. The Contractor shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein.

H.1.2 Notice to Proceed. Unless otherwise directed in the Contract Documents, Contractor shall commence Work on the Project Site within fifteen (15) Days of the Notice to Proceed. Notwithstanding the Notice to Proceed, Contractor shall not be authorized to proceed with the Work until all initial Contract requirements, including the Contract, performance bond and payment bond, and certificates of insurance, have been fully executed and submitted in a form acceptable to Owner.

H.1.3 Unless otherwise not required in the Construction Documents, Contractor shall participate in a pre-construction conference with the Owner's representative and designated design team. The purpose of this pre-construction conference is to review the Contractor's proposed Schedule of Values and to review any other Project logistics to be coordinated between the parties.

H.1.4 Unless specifically extended by a Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2(f) and shall be subject to the provisions of Section D.1.

H.1.5 The Owner shall not waive any rights under the Contract by permitting the Contractor to continue or complete in whole or in part the Work after the date described in Section H.1.2 above.

H.2 SCHEDULE

H.2.1 Contractor shall provide, by or before the pre-construction conference, the initial as-planned schedule for review and acceptance by the Owner. The submitted schedule must illustrate Work by Project components, labor trades, and long lead items broken down by building and/or floor where applicable. If Owner shall so elect, Contractor shall provide the schedule in CPM format showing the graphical network of planned activities, including i) a reasonably detailed list of all activities required to complete the Work; ii) the time and duration that each activity will take to completion; and iii) the dependencies between the activities. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. The schedule shall include the following: Notice to Proceed or the date the Work commences, if no Notice to Proceed is issued by Owner, Substantial Completion, and Final Completion. Schedules shall be updated monthly, unless otherwise required by the Contract Documents, and submitted with the monthly application for payment. Acceptance of the Schedule by the Owner does not constitute agreement by the Owner as to the Contractor's sequencing, means, methods, or durations. Any positive difference between the Contractor's scheduled completion and the Contract completion date is float owned by the Owner. Owner reserves the right to negotiate the float if it is deemed to be in Owner's best interest to do so. In no case shall the Contractor make a claim for delays if the Work is completed within the Contract Time but after Contractor's scheduled completion.

H.2.2 All Work shall be completed during normal weekdays (Monday through Friday) between the hours of 7:00 a.m. and 5:00 p.m. unless otherwise specified in the Contract Documents. Unless otherwise specified in the Contract Documents, no Work shall be performed during the following holidays:

- New Year's Day
- Martin Luther King Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans Day
- Thanksgiving Day
- Christmas Day
- President's Day

When a holiday falls on a Sunday, the following Monday shall be recognized as a legal holiday. When a holiday falls on Saturday, the preceding Friday shall be recognized as a legal holiday.

H.3 PARTIAL OCCUPANCY OR USE

The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have reasonably accepted in writing the responsibilities assigned to each of them. Approval by

the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I
CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. Contractor shall promptly remove from the premises and replace all defective materials and equipment as determined by the Owner, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. Contractor shall be allowed a period of no longer than thirty (30) Days after Substantial Completion for completion of defective (Punch List) work. At the end of the thirty-day period, or earlier if requested by the Contractor, Owner shall arrange for inspection of the Work by the Architect/Engineer. Should the work not be complete, and all corrections made, the costs for all subsequent reinspections shall be borne by the Contractor. If Contractor fails to complete the Punch List work within the thirty (30) Day period, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) Days after demand without affecting Contractor's obligations.

I.2 WARRANTY WORK

I.2.1 Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the Contractor from responsibility for Defective Work and, unless a longer period is specified, Contractor shall correct all defects that appear in the Work within a period of one year from the date of issuance of the written notice of Substantial Completion by the Owner except for latent defects which will be remedied by the Contractor at any time they become apparent. The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand and at Contractors sole expense. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) Days after demand, without affecting Contractor's obligations. The Contractor shall perform the warranty Work by correcting defects within twenty-four (24) hours of notification by Owner, unless otherwise specified in the Contract Documents. Should the Contractor fail to respond within the specified response time, the Owner may, at its option, complete the necessary repairs using another contractor or its agents. If Owner completes the repairs using Owner's agent, Contractor shall pay Owner at the rate of one and one-half (1½) times the standard hourly rate of Owner's agent, plus related overhead and any direct non-salary costs. If Owner completes the repairs using another contractor, Contractor shall pay Owner the amount of Owner's direct costs billed by the other contractor for the work, plus the direct salary costs and related overhead and direct non-salary expenses of Owner's agents who are required to monitor that contractor's work. Work performed by Owner using Owner's own agents or those of another contractor shall not affect the Contractor's contractual duties under these provisions, including warranty provisions.

I.2.2 Nothing in this Section I.2 provision shall negate guarantees or warranties for periods longer than one year including without limitation, such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.

I.2.3 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until such portion of the Work covered by the applicable warranty has been accepted in writing by the Owner.

I.2.4 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the Project Site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

I.2.5 Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

I.2.6 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable as determined by Owner. Such adjustment shall be effected whether or not final payment has been made.

SECTION J
SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

J.1.1 The Owner has the authority to suspend portions or all of the Work due to the following causes:

(a) Failure of the Contractor to correct unsafe conditions;

(b) Failure of the Contractor to carry out any provision of the Contract;

(c) Failure of the Contractor to carry out orders;

(d) Conditions, in the opinion of the Owner, which are unsuitable for performing the Work;

(e) Time required to investigate differing Project Site conditions; or

(f) Any reason considered to be in the public interest.

J.1.2 The Owner shall notify Contractor and the Contractor's Surety in writing of the effective date and time of the suspension, and Owner shall notify Contractor and Contractor's surety in writing to resume Work.

J.2 CONTRACTOR'S RESPONSIBILITIES

J.2.1 During the period of the suspension, Contractor is responsible to continue maintenance at the Project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.

J.2.2 When the Work is recommenced after the suspension, the Contractor shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the Work in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

Depending on the reason for suspension of the Work, the Contractor or the Owner may be due compensation by the other party. If the suspension was required due to acts or omissions of Contractor, the Owner may assess the Contractor actual costs of the suspension in terms of administration, remedial work by the Owner's agents or another contractor to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension, and any liquidated damages arising from the delay. If the suspension was caused by acts or omissions of the Owner, the Contractor may be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the Contractor or the Owner, neither party shall owe the other for the impact.

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

J.4.1 The Owner may, without prejudice to any other right or remedy, and after giving Contractor seven (7) Days' written notice and an opportunity to cure, terminate the Contract in whole or in part under the following conditions:

(a) If Contractor should, voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and Contractor as debtor-in-possession or the Trustee for the estate fails to assume the Contract within a reasonable time;

(b) If Contractor should make a general assignment for the benefit of Contractor's creditors;

(c) If a receiver should be appointed on account of Contractor's insolvency;

(d) If Contractor should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract Documents, or otherwise fail to perform the Work in a timely manner;

(e) If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner;

(f) If Contractor is otherwise in breach of any part of the Contract; or

(g) If Contractor is in violation of Applicable Laws, either in the conduct of its business or in its performance of the Work.

J.4.2 At any time that any of the above occurs, Owner may exercise all rights and remedies available to Owner at law or in equity, and, in addition, Owner may take possession of the premises and of all materials and appliances and finish the Work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive further payment until the Work is completed. If the Owner's cost of finishing the Work exceeds the unpaid balance of the Contract Price, Contractor shall pay the difference to the Owner.

J.5 TERMINATION FOR CONVENIENCE, NONAPPROPRIATION OF FUNDS, OR FORCE MAJEURE

J.5.1 Owner may terminate the Contract in whole or in part whenever Owner determines: (a) that termination of the Contract is in the best interest of Owner or the public; (b) that the Owner failed to receive funding, appropriations, allocations or other expenditure authority as contemplated by Owner's budget and Owner determines, in its sole determination, and its assessment and ranking of the policy objectives explicit or implicit in Owner's budget, Owner may determine it is necessary to and may terminate the Contract.; or (c) in the event of Force Majeure.

J.5.2 The Owner shall provide the Contractor with seven (7) Days prior written notice of a termination for Owner's or for public convenience. After such notice, the Contractor shall provide the Owner with immediate and peaceful possession of the premises and materials located on and off the premises for which the Contractor received progress payment under Section E. Compensation for Work terminated by the Owner under this provision will be according to Section E. In no circumstance shall Contractor be entitled to lost profits for Work not performed due to termination. If the Contract is terminated for public convenience, neither the Contractor not its Surety shall be relieved of liability for damages or losses suffered by the Owner as a result of defective, unacceptable or unauthorized Work completed or performed.

J.6 ACTION UPON TERMINATION

J.6.1 Upon receiving a notice of termination, and except as directed otherwise by the Owner, Contractor shall immediately cease placing further subcontracts or orders for materials, services, or facilities. In addition, Contractor shall terminate all subcontracts or orders to the extent they relate to the Work terminated and, with the prior written approval of the Owner, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts and orders.

J.6.2 As directed by the Owner, Contractor shall, upon termination, transfer title and deliver to the Owner all Record Documents, information, and other property that, if the Contract had been completed, would have been required to be furnished to the Owner.

J.6.3 Upon Owner's notice of termination pursuant to either Section J.4 or J.5, if Owner shall so elect, Contractor shall assign to the Owner such subcontracts and orders as Owner shall specify. In the event Owner elects to take assignment of any such subcontract or order, Contractor shall take such action and shall execute such documents as Owner shall reasonably require for the effectiveness of such assignment and Contractor shall ensure that no contractual arrangement between it and its subcontractors or suppliers of any tier or sub-tier shall prevent such assignment.

SECTION K
CONTRACT CLOSE OUT

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide Record Documents for the entire Project to Owner. Record Documents shall depict the Project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record Documents are part of the Work and shall be provided prior to the Owner's issuance of final payment. Record Documents include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS

As part of the Work, Contractor shall submit two completed operation and maintenance manuals ("O & M Manuals") for review by the Owner prior to submission of any pay request for more than 75% of the Work. Owner's receipt of the O & M Manuals shall be a condition precedent to any payment thereafter due. The O & M Manuals shall contain a complete set of all submittals, all product data as required by the specifications, training information, telephone list and contact information for all consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner shall review and return one O & M Manual for any modifications or adjustments required. Prior to submission of its final pay request, Contractor shall deliver two (2) complete and approved sets of O & M Manuals in paper form and one (1) complete and approved set in electronic form to the Owner and Owner's receipt of the O & M Manuals shall be a condition precedent to Owner's obligation to make final payment.

K.3 COMPLETION NOTICES

K.3.1 Contractor shall provide Owner written notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the Contractor shall finish all items on the Punch List accompanying the Certificate. Both completion notices must be signed and notarized by the Contractor and signed by the Architect/Engineer (if applicable) and Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.

K.3.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Owner. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on the Substantial Completion date. The Contractor may request that a Punch List be prepared by the Owner with submission of the request for the Substantial Completion notice.

K.4 TRAINING

As part of the Work, and prior to submission of the final application for payment, the Contractor shall schedule with the Owner training sessions for all equipment and systems as required by the Contract Documents. Contractor shall schedule training sessions at least two weeks in advance of the date of training to allow Owner to provide its personnel with adequate notice. If assignments arise because of termination under Section J.4, then such assignments shall not relieve Contractor of liability hereunder. The O & M Manual shall be used as a basis for training. In addition to any off-Project Site training required by the Contract Documents, training shall include a formal session conducted at the Project Site after the equipment and/or system is completely installed and operational in its normal operating environment.

K.5 EXTRA MATERIALS

As part of the Work, Contractor shall provide spare parts, extra maintenance materials, and other materials or products in the quantities specified in the Contract Documents prior to final payment. Delivery point for extra materials shall be designated by the Owner.

K.6 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the Contractor shall notify the Owner that all environmental and pollution clean-up, remediation and closure have been completed in accordance with all Applicable Laws and pursuant to the authority of all agencies having jurisdiction, and Contractor shall provide Owner with any and all documentation related to the same, including but not limited to directives, orders, letters, certificates and permits related to or arising from such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above. Contractor's completion of its obligations under this Section K.6 and Owner's receipt of documents evidencing such completion shall be a condition precedent to Owner's obligation to make final payment.

K.7 CERTIFICATE OF OCCUPANCY

Owner's receipt of an unconditioned certificate of occupancy from the appropriate state and/or local building officials shall be a condition precedent to Owner's obligation to make final payment, except to the extent failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of Owner.

K.8 OTHER CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for returning to the Owner all property of Owner issued to Contractor during construction such as keys, security passes, Project Site admittance badges, and all other pertinent items. Upon notice from Owner, Contractor shall be responsible for notifying the appropriate utility companies to transfer utility charges from the Contractor to the Owner. The utility transfer date shall not be before Substantial Completion and may not be until Final Completion, if the Owner does not take beneficial use of the facility and the Contractor's agents continue with the Work.

The Owner's property is drug free and weapons free areas and the use of tobacco products is only allowed in designated areas. Contractor shall be required to ensure that its employees, Subcontractors and agents shall comply with these requirements.

K.9 SURVIVAL

All warranty and indemnification provisions of the Contract, and all of Contractor's other obligations under the Contract that are not fully performed by the time of Final Completion or termination, shall survive Final Completion or any termination of the Contract.

SECTION L
GENERAL PROVISIONS

L.1 NO THIRD PARTY BENEFICIARIES

Owner and Contractor are the only parties to the Contract and are the only parties entitled to enforce its terms. Nothing in the Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly, or otherwise, to third persons unless such third persons are individually identified by name herein and expressly described as intended beneficiaries of the terms of the Contract.

L.2 SEVERABILITY

If any provision of the Contract is declared by a court to be unenforceable, illegal, or in conflict with any law, the validity of the remaining terms and provisions shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.

L.3 ACCESS TO RECORDS

L.3.1 Contractor shall keep, at all times on the Project Site, one record copy of the complete Contract Documents, including the Plans, Specifications, addenda, and Change Orders (if any) in good order

and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the Owner access thereto.

L.3.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access, for a period not less than ten (10) years, to all Record Documents, financial and accounting records, and other books, documents, papers and records of Contractor which are pertinent to the Contract, including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Work or the Contract shall be subject to litigation, Contractor shall retain all such records until all litigation is resolved and Contractor shall continue to provide Owner and/or its agents with full access to such records until such time as all litigation is complete and all periods for appeal have expired and full and final satisfaction of any judgment, order or decree is recorded and Owner receives a record copy of documentation from Contractor.

L.4 WAIVER

Failure of the Owner to enforce any provision of the Contract shall not constitute a waiver or relinquishment by the Owner of the right to such performance in the future nor of the right to enforce any other provision of the Contract.

L.5 SUCCESSORS IN INTEREST

The provisions of the Contract shall be binding upon and shall accrue to the benefit of the parties to the Contract and their respective permitted successors and assigns.

L.6 GOVERNING LAW

The Contract shall be governed by and construed in accordance with the laws of the State of Oregon without giving effect to the conflict of law provisions thereof.

L.7 APPLICABLE LAW

Contractor hereto agrees to comply in all ways with applicable local, state and federal ordinances, statutes, laws and regulations.

L.8 NON-EXLUSIVE RIGHTS AND REMEDIES

Except as otherwise expressly provided herein, the rights and remedies expressly afforded under the provisions of the Contract shall not be deemed exclusive, and shall be in addition to and cumulative with any and all rights and remedies otherwise available at law or in equity. The exercise by either Party of any one or more of such remedies shall not preclude the exercise by it, at the same or different times, of any other remedies for the same default or breach, or for any other default or breach, by the other Party.

L.9 INTERPRETATION

The titles of the sections of the Contract are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of its provisions.

L.10 DEBT LIMITATION

The Contract is expressly subject to the debt limitation of Oregon counties set forth in Article XI, Section 10, of the Oregon Constitution, and is contingent upon funds being appropriated therefore. Any provisions herein which would conflict with law are deemed inoperative to that extent.

L.11 LITIGATION

Any Claim between Owner and Contractor that arises from or relates to the Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Clackamas County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by the County of any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. CONTRACTOR, BY EXECUTION OF THE CONTRACT, HEREBY CONSENTS TO THE IN PERSONAM JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION.

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
SUPPLEMENTAL GENERAL CONDITIONS

PROJECT: #2018-17 Wichita Park Construction

The following modifies the November 1, 2017 Clackamas County General Conditions for Public Improvement Contracts ("County General Conditions") for this Contract. Except as modified below, all other terms and conditions of the County General Conditions shall remain in effect.

1. Section B.4-Permits of the County General Conditions is hereby deleted in it is entirety and replaced with the following:

   B.4 PERMITS
   The County ("Owner") shall obtain and pay for the following permits: Planning and Right-of-Way Permit, Grading Permit, Tree Removal Permit, and Erosion Control Permit. Contractor is responsible for obtaining and paying for the following permits: Plumbing Permit (Owner to pay for Meter only), Electrical Permit, and any other trade permits deemed necessary to complete construction. Contractor shall be responsible for all violations of the law, in connection with the construction or caused by obstructing streets, sidewalks or otherwise. Contractor shall give all requisite notices to public authorities.

2. **Good Faith Effort**
   As a condition of Contractor being awarded a Contract for this Project, Contractor must complete Good Faith Effort outreach and documentation as described in the Supplemental Instructions to Bidders of the Solicitation Document.

   The Contractor may not change who is performing each Division of Work identified in Form 1 of the Good Faith Effort without the express written advance approval of Owner. This includes substituting identified subcontractors, self-performance of a Division of Work that was identified to be performed by a subcontractor, or the Contractor subcontracting a Division of Work that was identified to be self-performed by the Contractor.

   Contractor shall be required to submit the completed Form 3 with its final pay application as a condition of final payment.

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PERFORMANCE BOND

Bond No.:_____
Solicitation: #2018-17
Project Name: Wichita Park Construction

_____(Surety #1)	Bond Amount No. 1:	$_____
_____(Surety #2)*	Bond Amount No. 2:*	$_____
** If using multiple sureties*	Total Penal Sum of Bond:	$_____

We, _____as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto North Clackamas Parks and recreation District ("District"), the sum of (Total Penal Sum of Bond) _____ (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with the District, along with the plans, specifications, terms and conditions of which are contained in the above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Performance Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal herein shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things undertaken by Contractor to be performed under the Contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the Contract, with or without notice to the Sureties, and shall defend, indemnify, and save harmless the District and its elected officials, officers, employees and agents, against any direct or indirect damages or claim of every

kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Principal or its subcontractors, and shall in all respects perform said contract according to law, then this obligation is to be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

If the District determines that any of the above conditions have not been met, the District may require payment under this bond at its sole and absolute discretion and Surety shall issue prompt payment of the full value of this bond without set-off or dispute or requirement for an opportunity to cure.

Nonpayment of the bond premium will not invalidate this bond nor shall the District, be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

By: _____
Signature

_____
Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____
[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

_____
Name

_____
Signature

_____
Address

_____
City State Zip

_____
Phone Fax

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PAYMENT BOND

Bond No.: _____
Solicitation: #2018-17
Project Name: Wichita Park Construction

_____(Surety #1)	Bond Amount No. 1:	$ _____
_____(Surety #2)*	Bond Amount No. 2:*	$ _____
* *If using multiple sureties*	Total Penal Sum of Bond:	$ _____

We, _____, as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto North Clackamas Parks and Recreation District ("District"), the sum of (Total Penal Sum of Bond) _____ _____ (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with the District, along with the plans, specifications, terms and conditions of which are contained in above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Payment Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and schedule of contract prices which are set forth in the Contract and any attachments, and all authorized modifications of the Contract which increase the amount of the work, or the cost of the Contract, or constitute authorized extensions of time for performance of the Contract, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things by it undertaken to be performed under said Contract and any duly authorized modifications that are made, upon the terms set forth therein, and within the time prescribed therein, or as extended therein as provided in the Contract, with or without notice to the Sureties, and shall defend, indemnify, and save harmless the District and its elected officials, officers, employees and agents, against any claim for direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Contractor or its subcontractors, and shall promptly pay all persons supplying labor, materials or both to the Principal or its subcontractors for prosecution of the work provided in the Contract; and shall promptly pay all contributions due the State Industrial Accident Fund and the State Unemployment Compensation Fund from the Principal or its subcontractors in connection with the performance of the Contract; and shall pay over to the Oregon Department of Revenue all sums required to be deducted and retained from the wages

of employees of the Principal and its subcontractors pursuant to ORS 316.167, and shall permit no lien nor claim to be filed or prosecuted against the District on account of any labor or materials furnished; and shall do all things required of the Principal by the laws of this State, then this obligation shall be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

If the District determines that any of the above conditions have not been met, the District may require payment under this bond at its sole and absolute discretion and Surety shall issue prompt payment of the full value of this bond without set-off or dispute or requirement for an opportunity to cure.

Nonpayment of the bond premium will not invalidate this bond nor shall the District be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES:

Dated this _____day of _____, 20____.

PRINCIPAL: _____

By: _____
Signature

_____
Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____
[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

_____
Name

_____
Signature

_____
Address

_____
City State Zip

_____
Phone Fax

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
PROJECT INFORMATION, PLANS, SPECIFICATIONS AND DRAWINGS

PROJECT: **#2018-17 Wichita Park Construction**

This project consists of construction for a neighborhood park located at 5908 SE Monroe Street, Milwaukie, Oregon. Currently, the site is a one-acre undeveloped lot.

Background:
In 2015 North Clackamas Parks and Recreation ("NCPRD") partnered with the City of Milwaukie and residents to create a Master Plan of the Wichita Park site. In 2016, the final design and construction funding was secured through an Oregon State Land and Water Conservation Fund Grant, NCPRD, and Linwood Neighborhood Association funds. NCPRD has completed construction plans and specifications for the park. The park project includes but is not limited to: clearing and grubbing, grading, installation of pavement, play equipment, fencing, drainage system, site furnishings, irrigation and planting, right-of-way improvements, and utility upgrades.

The City of Milwaukie owns the park property and NCPRD plans for, develops, and manages the City's parks under an Intergovernmental Agreement.

Engineers Estimate: $550,000.00

Key Dates:
All Basic Bid Work may begin as soon as the Notice to Proceed ("NTP")
Substantial Completion: September 15, 2018 (complete all work, except for seeding and plate establishment)
Final Completion: October 1, 2018

The Scope further includes the following Plans, Specifications and Drawings:

- Wichita Park Permit Set Specifications, dated March 1, 2018
- Wichita Park Drawing Set: Sheet No. G0.1, G0.2, C0.1, C1.0, C2.0, C3.0, C3.1, C4.0, C4.1, L0.1, L1.1, L2.1, L3.1, L4.1, L5.1, L6.1, L6.2, L6.3, and L6.4.

Wichita Park
Permit Set Specifications

March 1, 2018

Client:
North Clackamas Parks and Recreation District
150 Beavercreek Road
Oregon City, OR 97045

Prepared by:
Lango Hansen Landscape Architects
1100 NW Glisan St. #3B
Portland, OR 97217
Contact: Brian Martin
p: 503.295.2437

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SECTION 01 10 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Specifications, and general provisions of the Contract, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project includes but not limited to: Clearing and grubbing, grading, installation of pavement, play equipment, fencing, drainage system, signs and site furnishings, irrigation and planting, right-of-way improvements, and utility upgrades.

B. Architect Identification: The Contract Documents, dated March 1, 2018 were prepared by: Lango Hansen Landscape Architects.

1.3 CONTRACT

A. Contract Type: Stipulated Price as described in the Bid Proposal Form Section B-5.

B. Work of the Project includes construction of the Wichita Park. The proposed development is located at 5908 SE Monroe Street Milwaukie, Oregon 97222.

C. Off-site Work includes: Roadway improvements along the north face of Wichita Park from the ROW to the centerline of Monroe Street.

D. The Owner has applied for and paid for the following permits: Tree Removal, Grading, and right-of-way permits.

E. Contractor is responsible for procuring and paying for all project trade permits.
1. The Contractor is responsible to comply with all project permits.

F. Perform Work of Contract under a Lump Sum contract with Owner in accordance with Conditions of Contract.

G. It is not anticipated that the Owner will perform any Work on the site.

H. Contract Duration:
1. COMMENCEMENT DATE: Upon Issuance of Notice to Proceed (“NTP”)

2. SUBSTANTIAL COMPLETION DATE: September 15, 2018 (Except for seeding and plant establishment)

3. FINAL COMPLETION DATE: October 1, 2018

1.4 USE OF PREMISES

A. Construction staging, activities and schedules for this Project will be coordinated with the Owner's Representative.

B. Work limits are restricted to limits that have been shown on Contract Documents and approve by the Owner's Representative.

1.5 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7 a.m. to 7 p.m., Monday through Friday, except as otherwise indicated.
   1. Weekend Hours: Only as allowed by local jurisdictions AND by special arrangement with the Owner's Representative.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated below:
   1. Schedule for and notify Owner's Representative of facility after hours utility shut downs a minimum of five (5) days in advance of proposed utility interruptions.
   2. Quick utility disconnect and reconnects, hot taps, done during a time acceptable by the Owner's Representative are allowed but must be scheduled and approved two (2) weeks in advance. Contractor to provide all necessary warning signs and/or watch-staff to coordinate utility changeovers as approved.
   3. Do not proceed with utility interruptions without Owner's written permission.

1.6 WORK SEQUENCE

A. Provide construction facilities and temporary controls during mobilization. Contractor shall secure site access, construction staging, and project site.

B. Contractor will provide temporary signage stating the closure and/or limited access for this project as required by the Owner's Representative.

1.7 OWNER'S REPRESENTATION

A. Owner: North Clackamas Park and Recreation District.

B. Owner's Representative: the District's Project Manager, unless otherwise determined.

C. Landscape Architect: Landscape Architect of Record or other contracted Consultants as identified.

D. Special Inspectors: As identified to perform special inspections related to the Work of the Project.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preconstruction meeting.

B. Pre-Installation Conference.

C. Progress meetings.

D. Request For Information (RFI).

E. Product Data/Submittals.

F. Layout of work.

G. Permits

H. Field Engineering

1.2 DEFINITIONS

A. Product Data: Printed information, such as manufacture's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

B. Samples: Partial sections of manufactured or fabricated components, cuts or containers of material, color range sets a, and swatches showing color, texture, and pattern.
   1. Samples used to establish standard by which Work will be judged.

C. Mockups:
   1. Full-sized assemblies for review of construction, coordination, testing, or operation; they are not Samples.
   2. Approved mockups will be used to establish standard by which Work will be judges and maybe allowed to remain as part of the permanent Work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 PRECONSTRUCTION MEETING

A. Owner's Representative will schedule a meeting at the project site, no later than fifteen (15) days after Notice of Award.

B. Attendance Required:
   1. Owner's Representative
   2. Owner
   3. Landscape Architect
   4. Contractor Project Manager and Superintendent
   5. Subcontractors deemed necessary by Contractor and/or Owner's Representative.
   6. Manufacturers deemed necessary by Contractor and/ or Owner's Representative.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Submission of: list of subcontractors, schedule of values, and preliminary construction schedule.
   4. Designation of personnel representing the parties to Contract.
      a. Emergency off-hour contacts.
   5. Routing of correspondence.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling:
      a. Critical work sequencing.
      b. Special inspections.
   8. Use of premises by Owner and Contractor.
   9. Temporary Utilities provided by Owner.
   10. Survey and site layout by Contractor.
   11. Security and housekeeping procedures.
      a. Site access, traffic, and parking rules.
      b. Office, work, and storage areas.
      c. Working hours.
   12. Application for payment procedures.
   13. Procedures for Special Inspections.
   14. Procedures for maintaining record documents.
   15. As-built record keeping.

D. Record minutes and distribute copies within two (2) working days after meeting to all participants, and those affected by decisions made.

3.2 PRE-INSTALLATION CONFERENCES

A. Conduct pre-Installation Conference before each activity that requires coordination with other construction activities. Specification Sections requiring pre-Installation Conferences include but not limited to;
   1. Play Area
   2. Irrigation and Planting
   3. Right of Way work
   4. Other construction activities as appropriate

B. Attendance required:
   1. Owner's Representative.
   2. Owner

3. Landscape Architect
4. Contractor.
5. Manufacturer's representative, if required by manufacturer or these specifications.
6. Code enforcement personnel, if required by local codes.

C. Notifications:
1. Notify attendees of scheduled Conference a minimum of seven (7) calendar days in advance of the conference.

3.3 PROGRESS MEETINGS

A. Schedule and administer meetings throughout construction progress of the work at minimum weekly intervals or as determined by Owner's Representative.

B. Make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance required: Contractor's project manager, Job, major Subcontractors and suppliers, Owner's Representative, Owner, as appropriate to agenda topics for each meeting.

D. Record attendance and meeting minutes will be provided by Landscape Architect.
1. Meeting minute items will be numbered sequentially using meeting number and item number.
2. Meeting minutes will track all items until noted as resolved in the meeting minutes.

3.4 REQUEST FOR INFORMATION

A. When field conditions or contents of Contract Documents require clarification of verification by Architect, following procedure is required.
1. Present item or items requiring clarification/verification at Progress meeting for discussion. (For critical or emergency items, contact Owner's Representative immediately).
2. If it is determined by the **Owner's Representative or Architect/Engineer** that item or items do not require written RFI submittals, then clarification/verification shall be in Progress Meeting Report.
3. If it is determined by the **Landscape Architect or Owner's Representative** that item or items do require written RFI submittals, prepare each RFI on a form approved by Architect.
4. Number RFI sequentially from "001".
5. Record each RFI in a log, identifying each by RFI-#, subject, date submitted, date of response, and disposition. Update and distribute log at project meetings.
6. Provide a proposed solution to the RFI.
7. Landscape Architect shall respond to submitted RFI's within seven calendar days in space provided on RFI form.
8. If a potential cost impact is indicated on RFI, then include a change order request for the proposed work.

B. Route and copy RFI's in same manner as correspondence.

C. If an Agreement regarding clarification/verification for RFI's cannot be reached by the parties, see General Conditions and Supplementary Conditions for procedures to resolve conflict.

3.5 PRODUCT DATA/SUBMITTALS

A. Collect Product Data/Submittals into a single submittal for each element of construction or system.

B. Mark each copy to show applicable choices and options. Where printed Product Data/Submittals includes information on several products that are not required or proposed for Work, clearly mark copies to indicate applicable information.

C. Include following information:
1. Manufacturers' printed recommendations.
2. Compliance with trade association standards.
3. Compliance with recognized testing agency standards.
4. Performance characteristics and capacities.
5. Notation of dimensions verified by field measurement.
6. Required clearances, wiring and piping diagrams, and controls.
7. Manufacturer's standard schematic drawings and diagrams, modified as required to suit Project requirements.
8. Notation of coordination requirements.

D. Colors and Patterns: Except where specific color and pattern is indicated in Contract Documents, and whenever a choice of color or pattern is available in specified products, submit two (2) color and pattern charts to Architect/Engineer for selection.

E. Submit following for each required submittal:
1. Digital copy for Landscape Architect's Review.

F. Landscape Architect will return submittal marked with action taken and corrections or modifications required, to Contractor for distribution.

3.6 SAMPLES

A. Submit Samples for review of size, kind, color, pattern, and texture, and to illustrate functional and aesthetic characteristics of Product.

B. Where variation in color, pattern, or texture, or other characteristics is inherent in material or product represented, submit at least 3 multiple units that show approximate limits of variations, or number of units indicated in individual specification Sections.

C. Field Samples: Full-sized examples erected on-site to illustrate finishes, coatings, or finish materials and to establish Project standard.

3.7 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual Sections, submit them at project closeout:
1. Project record documents.
2. Operation and maintenance data.

3. Warranties.
4. Bonds.
5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.8 LAYOUT OF WORK

A. Survey and verify conditions of the Project Site.

B. Record existing conditions prior to construction for comparison with Contract Documents.
1. Report conflicts to Architect/Engineer prior to start of Work.
2. Architect will provide revisions to Contract Documents or issue instructions to deal with conflicts.
3. Be responsible for remedying conflicts, which could have been prevented by timely reviews of existing conditions.
4. Remedies, which vary from Contract Documents shall be approved by Architect/Engineer and Owner's Representative.

3.9 PERMITS

A. The following permits have been obtained by the Owner:
1. Planning and Right-of-Way Permit
2. Grading Permit
3. Tree Removal Permit
4. Erosion Control Permit

B. The Contractor is responsible for obtaining and paying the following permits:
1. Plumbing Permit (Owner to pay for Meter only)
2. Electrical Permit. See Design Build Requirements for work done to date.
3. Any other trade permits deemed necessary to complete construction.

3.10 FIELD ENGINEERING

A. Engineering Services:
1. Provide field engineering services as required for construction.
2. Locate and maintain and accurate benchmark on or near suite which has been established by a Registered Surveyor.
a. Relate subsequent elevations of finish grades and building elements to this benchmark.

B. Existing Control Points:
1. Protect control points prior to starting Work, and preserve permanent reference points during construction.
2. Make no changes or relocations of control points without written notice to Architect's/Engineer's Representative.
3. Report to Architect's/Engineer's Representative when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

C. Instrument layout:

1. Using site benchmarks and existing elevation control points, establish lines and levels, located and layed out by survey instrumentation.
2. Locate water supply, storm and sanitary sewer lines.
3. Locate edge and level of paving, curbs, walks, and sloping landscape.
4. Locate building foundations, columns locations, and floor levels.
5. Locate controlling lines and levels required for plumbing, mechanical and electrical Work within five (5) feet of building perimeter.

D. Corrections:
1. Record changes in elevations or location of Work on project record Documents.
2. Report errors in horizontal and vertical dimensions and grades prior to starting Work.

E. Verification:
1. Verify dimensions of new and existing Work.
   a. If field measurements differ slightly from Drawings, modify to accommodate. If field measurements differ significantly from Drawings, notify Architect/Engineer prior to commencing Work.
2. Coordinate locations of openings through floors, roofs and walls with Architectural, Mechanical and Electrical Drawings.

F. Documentation:
1. Submit documentation to verify accuracy of field engineering Work when requested by Architect/Engineer or Owner.

END OF SECTION

SECTION 01 3050

DESIGN BUILD REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Certain components of the Work under this project are Design Build. It is the Contractor's responsibility to coordinate and assume or assign to subcontractors the complete responsibility for the design, calculations, submittals, fabrication, transporation, and installation of the Design Build portions or components as required in this Section. The Applicant is responsible for submitting to the governing jurisdiction all Design Build documents required for the separate approval for each Design Build item. There are no exceptions. Design Build components of this Work are defined as complete, operation systems, provided for their intended use.

B. The Owner’s Representative’s review of Design Build submitals shall be for design intent and shall not lessen nor shift the responsibility from the Applicant or the assigned subcontractor to the Owner nor the design professional. The Owner shall not be responsible for paying for any delays, additional products, additional hours of work or overtime, restocking or rework required due to failure by the Applicant or the subcontractor to coordinate their Work with the Work of other trades on the project or to provide the Design Build portion or component in a timely manner to meet the schedule of the project.

C. Design Build components include all electrical design and installation required as indicated in the specifications and Drawings.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Division 1.

B. Design Build submittals are required to show complete criteria, design assumptions, details, calculations, submittals, instructions for fabrication, assemble, installation and interface with other trades, unless noted otherwise in the specific Specification Section.

1. Include product data for all components.

1.3 PERMITTING

A. Contractor to provide all information necessary for complete permit application.

B. Contractor to acquire all necessary permits before the commencement of any work.

1.4 REGULATORY REQUIREMENTS

A. Conform with current provisions of the following codes, standards, and specifications:

1. Federal Specifications

2. American National Standards Institute

3. National Electrical Manufacturer's Association

4. National Electrical Code

5. National Fire Protection Association

6. National Electric Safety Code

7. Uniform Building Code

B. Where conflicts exist between any of the above standards, the standard which is most stringent shall take precedence.

C. Contractor to be selected from PGE approved list.

1.5 COORDINATION

A. Work under this division shall be conducted in a manner to cooperate with other trades and contracts involved with this project.

B. Consult all drawings and specifications for the project and verify the requirements of all equipment by other divisions, the Owner or by other contracts prior to installation and connection.

C. Consult the drawings of all other divisions to avoid conflicts with cabinets, equipment, structural members, etc.

1.6 WARRANTY

A. Provide evidence of guarantees against defect for factory-assembled equipment and devices on which the manufacturers furnish standard published guarantees as regular trade practice; this guarantee shall not be less than one year after acceptance. The complete installation including workmanhip shall be guaranteed against defect for one year after final acceptance. The Contractor shall agree to correct, repair or replace defective materials/equipment at no additional cost to the Owner. The results of defective workmanship shall also be corrected at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Like items such as switches, receptacles, fixture types, panels, etc. shall be from one manufacturer.

B. All material shall be new and bear manufacturer's name, model number, electrical characteristics, UL label and other standard manufacturer identification.

2.2 ELECTRICAL WORK

A. Electrical Connection:

1. Contractor to provide electrical connection from existing onsite electrical pole. Obtain all necessary trade permits for this work. Work includes:

a. Excavate utility trench from existing utility pole to location shown on drawings

b. Install electrical conduit in trench

c. Install electrical meter and connect to power line. Power line from utility pole to meter to be installed by PGE.

B. Circuits:

1. Complete wiring to all panels, breakers, switches, outlets, lighting and other electrical equipment as specified and as indicated in the Drawings.

C. Meter:

1. Contractor to install meter in location as shown on Drawings. Meter shall meet all applicable City, County, and State Codes.

2. Provide all other circuit breakers and panels necessary for functioning system.

D. Irrigation Controller

1. Provide 117 VAC, 60 Hz. See Irrigation specifications and product literature for additional information.

2. Provide (4) 110-volt plug outlets inside control cabinet for non-controller use.

PART 3 EXECUTION

3.1 GENERAL

A. Contractor to supply all necessary equipment, tools, and products necessary to install system as shown on Drawings and as specified.

3.2 DIVISION OF LABOR

A. Existing power line serving onsite utility pole to be disconnected and removed by PGE.

B. Contractor to remove and dispose of onsite utility pole and light.

C. PGE to relocate existing guy wire support for pole located in ROW on south side of SE Monroe St.

D. PGE to install new power line and provide power drop at existing pole located in ROW on south side of SE Monroe St. PGE to install conduit and power line down to base of pole.

E. Contractor (approved by PGE) to excavate trench and install conduit from pole to onsite location of meter, as shown on drawings.

F. PGE to install power line from pole to meter located onsite.

G. Contractor to connect power line to meter.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. References and Standards.

B. Quality assurance submittals.

C. Control of Installation.

D. Testing and inspection services.
   1. Inspection and testing services required to verify compliance with requirements specified or indicated as provided by the Owner.

1.2 REFERENCES

A. ASTM C 1021-08 – Standard Practice for Laboratories Engaged in Testing of Building Sealants.

B. ASTM C1077-10d- Standard Practice for Laboratories Testing Concrete and Concrete Aggregate for Use in Construction and Criteria for Laboratory Evaluation.

C. ASTM C 1093-09 – Standard Practice for Accreditation of Testing Agencies for Unit Masonry.

D. ASTM D 3740 -10- Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

E. ASTM E 329-09 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.

F. ASTM E 543-09 – Standard Practice for Agencies Performing Nondestructive Testing.

1.3 QUALITY ASSURANCE

A. Qualifications for Inspection and Testing Agencies: For Contractors information only
   1. Owner will engage inspection and testing service agencies that are prequalified as complying with American Council of Independent laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in types of inspections and test to be performed.
   2. Each independent inspection and testing agency engaged on Project to be authorized by authorities having jurisdiction to operate in State where Project is located.

B. Duties of Testing Agency:

1. Testing agency shall cooperate with Architect/Engineer and Contractor in performing its duties.
2. Agency to provide qualified personnel to perform inspections and test.
3. Agency to **immediately** notify Architect/Engineer and Contractor of irregularities or deficiencies observed in Work during performance of its services.
4. Except as otherwise specified, testing laboratory to secure, handle, and store samples and specimens for testing.

1.4 SUBMITTALS

A. For Contractors information only: Test Reports: After each test / inspection, promptly submit one copy of report to Architect/Engineer, Owner's Representative and Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specification section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Result of test/inspection.
      j. Conformance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test reports are submitted for Architect and Owner's Representative's knowledge as contract administrators for the Owner, for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the contract documents.

B. Certificates: When specified in individual sections, submit certification by manufacturer and Contractor or installation/application subcontractor to Landscape Architect**,** in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

C. Manufacturer's Instructions: When specified in individual specifications sections, submit printed instructions for delivery, storage, assembly, installation, start-up**,** adjusting, and finishing, for the Architect's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.5 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing; and inspections.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Landscape Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 TESTING AND INSPECTION

A. See individual specification sections for testing; and inspection required and Quality Control Inspections listed above.

B. Testing Agency Duties:
1. Test samples of mixes submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Landscape Architect and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. **Immediately** notify Landscape Architect and Contractor of observed irregularities or non-conformance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Attend preconstruction meetings and progress meetings.
8. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used, which require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide location for storage and curing of test samples.
4. Notify Architect and Testing agency 24-hours prior to expected time for operations requiring testing/inspection services
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

F. Inspections and testing costs required by defective Work or improperly timed notices shall be paid by Contractor.

G. Utilization of testing laboratory services in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

3.3 REPAIR AND PROTECTION

A. Upon completion of inspection, testing, and sample taking, repair damaged construction.
1. Restore substrates and finished
2. Comply with Section 01 70 00 - Cutting and Patching.

B. Protect construction exposed by or for quality control service activities, and protect repaired construction.

C. Repair and protection are Contractor’s responsibility, regardless of assignment of responsibility for inspection and testing.

3.4 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Landscape Architect, it is not practical to remove and replace the Work, Landscape Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SUBSTITUTION REQUEST

The Construction Specifications Institute
Northwest Region

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Section No.	Page	Paragraph	Description

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable portions.

Attached data also includes description of changes to Contract Documents that proposed substitution requires for proper installation.

Undersigned certifies that the following items, unless modified by attachments, are correct:

1. Proposed substitution does not affect dimensions shown on Drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts are available locally or are readily obtainable for proposed substitution.

Undersigned further certifies that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.

Undersigned agrees that, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.

Submitted by

_____
Name (Print)

_____
Signature

_____
Firm Name

Noted

_____
Late
Address

_____
City, State, Zip

_____
Date

_____
Telephone Fax

_____
General Contractor (if after award of Contract)

For use by A/E:

____ Approved ____ Approved as

____ Not Approved ____ Received Too

_____
By

_____
Date

_____
Remarks

Attachments

1999 Edition

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds

1.2 SUBMITTALS

A. Project Record Documents: Submit documents to Architect/Engineer with claim for final Application for Payment.
   1. Upon acceptance by Architect/Engineer, submit Record Documents to Owner's Representative with transmittal letter containing date, project title, Contractor's name and address, list of documents, and signature of Contractor.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or purposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operation by Owner, submit completed documents within ten days after acceptance.
   3. Submit one (1) copy of completed documents fifteen (15) days prior to final inspection. This copy will be reviewed and returned with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within ten (10) days after final inspection.

C. Warranties and Bonds:
   1. Submit final warranties prior to final application for payment.
   2. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten (10) days after acceptance.
   3. Make other submittals within ten (10) days after Date of Substantial Completion, prior to Final Application for Payment.
   4. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance as the beginning of the warranty period.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 SUBSTANTIAL COMPLETION

A. Prior to requesting inspection for certification of Substantial Completion, complete following.
   1. In Application for Payment that coincides with, or first follows, date of Substantial Completion is claimed, show 100 percent completion for portion of Work claimed as substantially complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents.
      b. If 100 percent cannot be shown, include a list of incomplete items, value of incomplete construction, and reason Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities.
      a. Include occupancy permits.
   5. Submit:
      a. Record Drawings
      b. Record Specifications
      c. Maintenance Manuals
      d. Final project photographs
      e. Damage or settlement surveys
      f. Property surveys
      g. Other final record information
   6. Deliver tools, spare parts, extra stock, and similar items.
   7. Make final changeover of permanent locks and transmit keys to owner.
      a. Advise Owner’s personnel of changeover in security provisions.
   8. Complete startup testing of systems and instructions to owner’s operation and maintenance personnel.
   9. Discontinue and remove temporary facilities from site, along with mockups, construction tools, and similar elements.
   10. Complete final cleanup requirement Per section 01 70 00
   11. Touch up and otherwise repair and restore marred, exposed finishes, including touchup painting.

B. Inspection Procedures: See section 01 70 00 Execution and Closeout Requirements.

3.2 PROJECT RECORD DOCUMENTS

A. Architect/Engineer and Contractor will review the record drawings weekly during or after each weekly progress meeting.

B. Maintain on site one set of the following record documents: record actual revisions to the Work and identify as RECORD DRAWINGS – PROJECT SET:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modification to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation and adjusting.

C. Mark Drawings to show actual installation and construction where construction varies substantially from Work as shown.
   1. Using an erasable colored pencil (not ink or indelible pencil) clearly describe change by graphic line and note.
   2. Date Entries, and notes related Change order numbers where applicable.
   3. Call attention to entries by a "Cloud" drawn around areas affected.
   4. Where overlapping changes occur, mark with different colors.

D. Conversion of Schematic Layouts:
   1. Design of future modifications of facility may require accurate information as to final physical layout of items which as shown schematically on Drawings.
   2. Show on Project set of Record Drawings, by dimension accurate to within one inch centerline of each run of items shown schematically on Drawings. Clearly identify item by accurate note such as "cast iron drain", "galv. Water", and like. Show by symbol or note, vertical location of item ("under slab", in ceiling plenum", "exposed", and like). Relate by identification descriptive to Specifications.

E. Ensure entries are complete and accurate, enabling future reference by Owner.

F. Store record documents separate from documents used for construction.

G. Record information concurrent with construction progress.

H. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Show changes in actual Work performed in comparison with Specification text.
   3. Product substitutions or alternates utilized.
   4. Changes made by Addenda and modifications, such as Change Orders and modifications issued during construction.

I. Record Drawings and Shop drawings legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original contract drawings.

J. Record Document Project Manual:
   1. Maintain one copy of Project Manual, including addenda, Change Orders, and similar modifications.
   2. Mark up variations occurring in the actual work.
   3. Record substitutions and selection of options.
   4. Cross reference with other documents.

K. Record Product Data:
   1. Maintain one copy of Project Data Sample.
   2. Mark up significant variations in the actual work, Include:
      a. Variations in product as delivered to site.
      b. Variations from manufacturer's instructions and recommendations for installation.
   3. Cross-referenced with Change Orders and mark up Record Drawings and Specifications.

L. Record sample submittal: Immediately prior to Date(s) of Substantial Completion, Architect/Engineer will meet with the Contractor at site, and determine which, if any, samples to be transmitted to Owner.
   1. Comply with Architect's/Engineer's instructions for packaging, identification marking, and delivery to Owner's sample storage place.
   2. Dispose of other samples

M. Miscellaneous record submittals:
   1. Refer to other sections of these specifications for requirements of miscellaneous record keeping and submittal in connections with performance of the work.
   2. Prior to Date of Completion:
      a. Complete miscellaneous records and place in good order.
      b. Identify and bind or file.
      c. Make ready for continued use and reference.

N. Inspection reports:
   1. Submit certificates from applicable local governmental agencies that the construction has been inspected as required by laws or ordinances and that the building is approved for occupancy.

O. Keys:
   1. Deliver at Completion Date or such earlier date as the Owner's Representative may designate for earlier occupancy by the Owner.
   2. Tag each key to indicate lock which key operates.
   3. Accompany keys with final hardware schedule, as specified in Finish Hardware Schedule.

P. Final Record Documents: Prior to request for Substantial Completion, submit two complete sets of bond and electronic copies of Contract As-Built Drawings.
   1. Clearly indicate at each affected detail and other drawings a full description of changes made during construction, and actual location of items.
   2. Show final locations of electrical junction in concealed locations.
   3. Call attention to entries by a "cloud" drawn around areas affected.

4. Make changes neatly, consistently, and with proper media to assure longevity and clear reproduction.

Q. Record Drawings electronic files:
1. Delivery Medium: Compact Disk
2. Provide record drawings in PDF format.
3. File Naming: Include project identification and sheet identification.

3.3 OPERATION AND MAINTENANCE DATA

A. For each product or System: list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of components parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.4 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion data.

3.5 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristic, and limiting conditions.
3. Include performance curves, with engineering data and test.
4. Complete nomenclature and model number of replacement parts.

B. Panel board Circuit Directories: Provide electrical service characteristics, controls, and communications; typed by label machine.

C. Include color-coded wiring diagrams as installed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instruction. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's part list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide Contractors coordination drawings, with color-coded piping diagrams as installed.

L. Provide charts of valve tag numbers, with locations and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, and recommended quantities to be maintained in storage.

N. Include test and balancing reports.

O. Additional Requirements: As specified in individual product specification sections.

3.6 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experience in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2 x 11 inch, three ring binders with durable plastic; covers, 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; Identify title of Project; Identify subject matter of contents and date of creation.

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data bond paper.

G. Drawings: Provide with reinforced punched binder tab. Bind in with text; Fold larger drawings to size of text pages.

H. Arrange content by systems and sequenced of Table of Contents of this Project Manual.

I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arrange by specification section. For each category, identify names, addresses and telephone numbers of Subcontractors and suppliers, Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties and bonds.

J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion data.

K. Table of Contents: Provide title of Projects; names, addresses; and telephone numbers of Architect/Engineer, Consultants and Contractor with name of responsible parties; schedules of products and systems, indexed to content of the volume.

3.7 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten (10) days after completion of the applicable item of work. Except for items put into use with Owner permission, leave date of beginning of time of warranty until the Date of Substantial Completion is determined.

B. Verify that documents are in proper form and acceptable to Owner, contain full information, and are notarized.
   1. Manufacturer shall countersign warranty.
   2. Subcontractor and installer shall countersign warranty where specified.
      a. Provide required warranties for waterproofing and roofing systems countersigned by subcontractor and installer.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Include photocopies of each in operation and maintenance manuals, indexed separately on Table of Contents.

F. Warranties are intended to protect owner against failure of work and against deficient, defective and faulty materials and workmanship, regardless of source.

G. Limitations: Warranties are not intended to cover failures that result from:
1. Unusual or abnormal phenomena of the elements.
2. Owner's misuse, maltreatment or improper maintenance of work.
3. Vandalism after substantial completion.
4. Insurrection or acts of aggression including war.

H. Related Damages and Losses: remove and replace work which is damaged as a result of failure, or which must be removed and replaced to provide access for correction of warranted work.

I. Warranty Reinstatement: After correction of warranted work, reinstate warranty for corrected work to date of original warranty expiration, but not less that half original warranty period.

J. Replacement cost: Replace or restore failing warranted items without regard to anticipated useful service lives.

K. Rejection of Warranties: Owner reserves the right to reject unsolicited and coincidental product warranties that detract from or confuse interpretations of Contract Documents.

L. Manual / Binders: Commercial quality, 8-1/2 x 11 inch, three ring binders with durable plastic; covers.

M. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS; with title of Projects; names, addresses; and telephone numbers of Contractor and equipment suppliers, name of responsible company principal and date.

N. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

O. Separate each warranty or bond with index tab sheets keyed to the table of contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Preparing subgrades
2. Base course for concrete walks.
3. Base course for asphalt paving.
4. Excavating and backfilling for utility trenches.
5. Drainage fill for infiltration facilities.

1.2 SUBMITTALS

A. Product Data.

B. Aggregate Sieve Analysis.

C. Infiltration test results.

1.3 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.
1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the subbase course, or subgrade, and concrete, or hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Landscape Architect]. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Landscape Architect. Unauthorized excavation, as well as remedial work directed by Landscape Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or cement concrete.

J. Subgrade: Surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

L. Drainage Fill: Free draining, open-graded aggregate course used to support pervious pavement or in drainage zones in flow-through planters, vegetated stormwater facilities and infiltration galleries.

M. Unified Soil Classification System:
1. GW: Well-graded gravels; gravel/sand mixtures with little or no fines.
2. GP: Poorly-graded gravels; gravel/sand mixtures with little or no fines.
3. GM: Silty gravels; poorly-graded gravel/sand/silt mixtures.
4. GC: Clayey gravels; poorly-graded gravel/sand/clay mixtures.
5. SW: Well-graded sands' gravelly sands with little or no fines.
6. SP: Poorly-graded sands; gravelly sands with little or no fines.
7. SM: Silty sands; poorly, graded- sand/gravel/silt mixtures.
8. SC: Clayey sands; poorly-graded sand/gravel/clay mixtures.
9. ML: Inorganic silts; sandy, gravelly, or clayey silts.
10. CL: Lean clays; inorganic, gravelly, sandy, or silty, low to medium-plasticity clays.
11. OL: Organic, low-plasticity clays and silts.
12. MH: Inorganic, elastic silts; sandy, gravelly or clayey elastic silts
13. CH: Fat clays; high-plasticity, inorganic clays.
14. OH: Organic, medium to high-plasticity clays and silts
15. PT: Peat, humus, hydric soils with high organic content.

1.4 PROJECT CONDITIONS

A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Landscape Architect and then only after arranging to provide temporary utility services according to requirements indicated.

C. Site Information: Research public utility records and verify existing utility locations prior to ordering any material. Notify the Landscape Architect immediately if any discrepancies are found in the project survey.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve or [use Oregon Standard Specifications for Construction 3/4-inch-0" BASE AGGREGATE.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 3-inch sieve and not more than 12 percent passing a No. 200 sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve or use Oregon Standard Specifications for Construction ¾-inch—0-inch BASE AGGREGATE.

G. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

H. Backfill and Fill:
   1. Satisfactory soil materials
   2. Initial trench backfill: Use OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION (3/4-inch – 0-inch) base aggregate.

I. Drainage Fill: Angular, granular material with a maximum particle size of 2 inches and shall meet Oregon Standard Specification 00430.11 The material shall be free of roots, organic material, and other unsuitable materials; have less than 2 percent passing the No. 200 sieve (washed analysis); and have at least two mechanically fractured faces.

J. Drywell Filter Material: Refer to Section 33 41 00 “Storm Utility Drainage Piping.”

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction or as follows:
   1. Red: electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: telephone and other communications.
   4. Blue: Water systems.
   5. Green: Sewer systems.

B. Tracer Wire: 12 AWG minimum solid copper insulated High Molecular Weight Polyethylene (HMW PE) tracer wire or approved equal. The tracer wire insulation shall be green for sewer pipe and blue for waterlines and be a minimum of 45 mil. thick. Joints or splices shall be waterproof. The wire shall be rated for 30 Volt.

C. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
   1. Grab Tensile Strength: 110 lbf; ASTM D 4632.
   2. Tear Strength: 40 lbf; ASTM D 4533.
   3. Puncture Strength: 220 lbf; ASTM D 4833.
   4. Apparent Opening Size: No. 40; ASTM D 4751.
   5. Permativity (minimum): .5 sec^{-1}; ASTM D 4491.

D. Separation Fabric: Woven geotextile, specifically manufactured as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
   1. Grab Tensile Strength: 180 lbf; ASTM D 4632.
   2. Tear Strength: 68 lbf; ASTM D 4533.
   3. Puncture Strength: 371 lbf; ASTM D 4833.
   4. Apparent opening size: No. 30; ASTM D 4751.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations. Provide protective insulating materials as necessary.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section “Site Clearing.”

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section [“Site Clearing”] during earth moving operations.

D. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

E. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

F. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

G. Protect all areas designated to be infiltration facilities from foot or equipment traffic and surface water runoff. Do not use proposed infiltration facilities to dispose of surface water runoff during construction. Under no circumstances shall material and equipment be stored on top of the installation area. Contractor shall not backfill facility until Engineer or Landscape Architect has inspected it and signed off.

H. Protect all areas designated to receive pervious pavers or pervious pavement from excessive compaction.

3.2 EXPLOSIVES

1. Explosives: Do not use explosives.

3.3 EXCAVATION

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions without prior approval by the Landscape Architect.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
   1. Clearance: 6 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade and bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
   1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipes.
   2. Excavate utility structures to provide 6 inches clearance (enlarge as needed) to allow for compaction of backfill material.

3.7 EXCAVATION FOR STORMWATER INFILTRATION FACILITIES

A. Excavate facilities to the indicated gradients, lines, depths, and elevations. All excavations shall be performed with the lightest practical excavation equipment. Excavation equipment shall not be operated within the limits of the facility.

B. To help prevent subgrade soil contamination and clogging by sediment, facility construction shall be delayed until all other construction within its drainage basin is completed and the drainage area stabilized. Provide additional sediment control measures such as diversion berms around the facility as needed. Additional excavation and backfill required to restore any infiltration rate lost due to clogging or over-compaction during construction shall be performed by the contractor at no cost to the owner.

3.8 INFILTRATION TESTING

A. The contractor shall perform one open-pit falling head infiltration test within each proposed infiltration facility to verify the infiltration rate of the native soils. Pre-soak prior to testing.

1. Open Pit Falling Head Procedure:

a. Excavate a hole with bottom dimensions of approximately 2 feet by 2 feet into the native soil to the elevation of the proposed facility bottom. If smooth auguring tools or a smooth excavation bucket is used, scratch the sides and bottom of the hole with a sharp pointed instrument, and remove the loose material from the bottom of the test hole.

b. Fill the hole with clean water a minimum of 1 foot above the soil to be tested, and maintain this depth of water for at least 4 hours (or overnight if clay soils are present) to presoak the native material. In sandy soils with little or no clay or silt, soaking is not necessary. If after filling the hole twice with 12 inches of water, the water seeps completely away in less than 10 minutes, the test can proceed immediately.

c. The measurements should be made with reference to a fixed point. A lath placed in the test pit prior to filling or a sturdy beam across the top of the pit are convenient reference points. The tester and excavator should conduct all testing in accordance with OSHA regulations.

d. After the presaturation period, refill the hole with water to 12 inches above the soil and record the time. Alternative water head heights may be used for testing provided the presaturation height is adjusted accordingly and the water head height used in infiltration testing is 50 percent or less than the water head height in the proposed stormwater system during the design storm event. Measure the water level to the nearest 0.01 foot (1/8 inch) at 10-minute intervals for a total period of 1 hour (or 20-minute intervals for 2 hours in slower soils) or until all of the water has drained. In faster draining soils (sands and gravels), it may be necessary to shorten the measurement interval in order to obtain a well-defined infiltration rate curve.

e. Repeat the test. Successive trials should be run until the percent change in measured infiltration rate between two successive trials is minimal. The trial should be discounted if the infiltration rate between successive trials increases. At least three trials must be conducted. After each trial, the water level shall be readjusted to the 12 inch level.

f. The average infiltration rate over the last trial should be used to calculate the un-factored infiltration rate. The final rate must be reported in inches per hour.

g. Upon completion of the testing, the excavation must be backfilled.

h. For very rapidly draining soils, it may not be possible to maintain a water head above the bottom of the test pit. If the infiltration rate meets or exceeds the flow of water into the test pit, conduct the test in the following manner:

1) Approximate the area over which the water is infiltrating.

2) Using a water meter, bucket, or other device, measure the rate of water discharging into the test pit.
3) Calculate the infiltration rate by dividing the rate of discharge (cubic inches per hour) by the area over which it is infiltrating (square inches).

i. Provide all test results to the Engineer/Landscape Architect.

3.9 SUBGRADE INSPECTION

A. Proof-roll subgrade with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Do not proof-roll subgrade in infiltration facilities.

B. Soft pockets and areas of excess yielding that have been identified shall be scarified and moistened or aerated, or removed and replaced with suitable soil materials to the depth required. Re-compact and retest until specified compaction is obtained.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Landscape Architect, without additional compensation.

3.10 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Landscape Architect.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Landscape Architect.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILLS AND FILLS

A. Backfill: Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.13 UTILITY TRENCH BEDDING

A. Place bedding on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

3.14 UTILITY TRENCH BACKFILL

A. Place and compact initial trench backfill material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
   1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

B. Place and compact final backfill of satisfactory soil to final subgrade elevation.

C. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

D. Install tracer wire in a continuous fashion above the utility in such a manner as to be able to properly trace utility lines without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire. Bring tracer wire to the surface at every box, vault, drainage structure, or manhole.

3.15 DRAINAGE FILL

A. Compaction of the native soil subgrade should be limited in order to prevent a reduction in the permeability of the soil.
   1. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and underlying soils scarified to a minimum depth of 3 inches with a York rake or equivalent and light tractor.
   2. Where subgrade has been compacted due to construction traffic, subgrade shall be scarified or removed to a depth sufficient to match the naturally occurring insitu state. Add additional base course material to meet design grades at no cost to the owner.
   3. Bring subgrade of base course to line, grade, and elevations indicated. Fill and lightly re-grade any areas damaged by erosion, ponding, or traffic compaction before the placing of stone.

B. Place drainage geotextile over prepared subgrade, overlapping ends and edges at least 12 inches. Secure in place to prevent wrinkling.

C. Place drainage fill and compact by tamping with a plate vibrator, and screed to depth indicated. For drainage fill that exceeds 8 inches in compacted thickness, place fill in layers of equal thickness, with no compacted layer more than 8 inches or less than 4 inches thick.

D. Place drainage geotextile over compacted drainage fill, overlapping ends and edges at least 12 inches.

3.16 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.
   3. Under footings and foundations, use engineered fill.
   4. Under and around utility structures, use engineered fill.

3.17 STORMWATER INFILTRATION FACILITY FILL

A. Growing media shall be placed in loose lifts, not to exceed 8 inches each.

B. Placement of the growing media will not be allowed when the weather is too wet as determined by the owner's representative.

3.18 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
   1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.19 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

D. Growing media shall be compacted with a water-filled landscape roller. It shall not otherwise be mechanically compacted.

3.20 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

3.21 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course base course under pavements and walks as follows:
1. Shape base course to required crown elevations and cross-slope grades.
2. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
3. Compact base course] at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.22 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Testing Agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area, but in no case fewer than three tests.
   2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.

D. With the approval of the Engineer, proof-roll testing of subgrade and/or aggregate base may be substituted for other compaction testing.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.23 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

D. Weather permitting and as approved, stormwater infiltration facility plants shall be installed as soon as possible after placing and grading the growing media in order to minimize erosion and further compaction.

3.24 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

SECTION 32 12 16

ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Hot-mix asphalt patching.
2. Pavement-marking paint.
3. Pavement-marking thermoplastic material.

B. Related Requirements:
1. Section 31 20 00 "Earth Moving" for subgrade preparation, fill material, aggregate subbase and base courses, and aggregate pavement shoulders.
2. City of Milwaukie Public Works standards.

1.2 SUBMITTALS

A. Product Data: For each type of product. Include technical data and tested physical and performance properties.
1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the work.
2. Job-mix Designs: For each job mix proposed for the Work.

B. Material Certificates: For each paving material.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements Section 0744 of the 2015 Oregon Standard Specifications for Construction for asphalt paving work.
1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.
2. Comply with City of Milwaukie Public Works standards.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expect before time required for adequate cure, or if the following conditions are not met:
1. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Asphalt Base and Surface Course:

Dense Graded Mixes	Surface Temperature
Less than 2 inches (51 mm)	60 degrees F (15.55 degrees C)

2 inches – 2 1/2 inches (51 mm – 63.5 mm)	50 degrees F (10 degrees C)
Greater than 2 1/2 inches (63.55 cm)	40 degrees F (4.44 degrees C)

3. If placing asphalt between March 15 and September 30, temperature may be lowered 5 degrees F.
4. Do not use field burners or other devices to heat the pavement to the specified minimum temperature.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil based materials and 55 deg F for water-based materials, and not exceeding 95 deg F.

C. Thermoplastic Pavement-Markings: Proceed with pavement markings only on clean, dry surfaces, minimum ambient or surface temperature shall be 50 deg F.

PART 2 PRODUCTS

2.1 AGGREGATES

A. Conform to the requirements of City of Milwaukie Public Works standards.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a, PG 64-22.

B. Tack Coat: [STM D 977 or AASHTO M 140 emulsified asphalt.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles, or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint.
1. Color: As Indicated.

C. Glass Beads: AASHTO M 247, Type 1.

2.4 MIXES

A. Recycled Content of Hot-Mix Asphalt: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10 percent or more than 30 percent by weight.
1. Surface Course Limit: Recycled content no more than 30 percent by weight.

B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes [approved by authorities having jurisdiction] and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Provide mixes conforming to section 00744 of the 2015 Oregon Standard Specifications for Construction.
3. Base Course: Level 3 1/2 inch dense, HMAC.
4. Surface Course: Level 3 1/2 inch dense, HMAC.

PART 3 EXECUTION

3.1 EXAMINATION

A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply tack coat uniformly to vertical asphalt surfaces. Apply at a rate of 0.05 to 0.15 gal./sq. yd.
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

D. Asphalt and sand seal edges where new asphalt concrete meets existing pavement.

3.3 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 PLACING HOT-MIX ASPHALT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
   1. Spread mix at a minimum temperature of 250 deg F.
   2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
   3. Offset transverse joints, in successive courses, a minimum of 24 inches.
   4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.6 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
4. Difference between adjacent panels: 1/8 inch.

3.8 PAVEMENT MARKING

A. Do not apply pavement-marking paint or thermoplastic material until layout, colors and placement have been verified with architect.

B. Allow paving to age for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

E. Install thermoplastic pavement markings as indicated on the drawings per the requirements of section 00850 and 00867 of the 2015 Oregon Standard Specifications for Construction.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

B. Replace and compact hot-mix asphalt where core tests were taken.

C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.10 WASTE HANDLING

A. Except for material indicated to be recycled, remove excavated materials from Project Site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 32 12 16

SECTION 32 13 43

PERVIOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Subgrade preparation.
   2. Installation of Pervious Concrete Sidewalk.

1.2 RELATED SECTIONS

A. Section 31 20 00 “Earth Moving.”

1.3 REFERENCES

A. ACI 522.1-08 “Specification for Pervious Concrete Pavement.”

B. When working within the public right-of-way, comply with governing Public Agency Specifications if more restrictive than specified herein.

C. EPR Criteria for consultants, installers, concrete suppliers and testing labs.

D. ACI 306R “Cold Weather Concreting” (with specific exceptions pertaining to pervious concrete).

1.4 SUBMITTALS

A. Design mixtures: For each paving mixture.
   1. Indicate where the mix and similar project mix variation have been successfully used on other recent pervious projects.

B. Certificates of qualifications for:
   1. Pervious concrete installer.
   2. Pervious concrete supplier.

C. Sample test panel for proposed mix. Sample Test Panel placed on site will be the basis for meeting project criteria, and shall be in conformance with Section 1.6.C “Test Panels”.

D. One (1) permeability test of the compacted base aggregate

E. One (1) permeability test result for the proposed mix in inches per hour as determined by ASTM C 1701 or approved equal.

F. Jointing and spacing plan.

G. An owner's manual for cleaning, repair, and maintenance for installed pervious pavement.

H. One-Year Limited Warranty for installed pervious pavement.

1.5 QUALITY ASSURANCE

A. Perform work in this section in accordance with minimum qualifications for consultants, concrete suppliers, installation contractor, and testing companies, unless otherwise authorized by the design professional of record. Note much of this document is based on ACI 522.1-08 Specifications for Pervious Concrete Pavements. Important note: some sections of this specification are specifically referring to qualifications that are intentionally contrary to ACI 522.1-08. If the two specifications conflict, this specification takes precedence. Use of ASTM C140 is not allowed to compare fresh voids to hardened voids.

B. When placing concrete during cold weather, follow recommendations of ACI 306R (Except sections within 306R related to Heated Water, Slump, Compressive Strength, Walls, Maturity meters, cement content, and Accelerators which do not apply to pervious concrete.

1.6 QUALIFICATIONS

A. All consultants, installers, and product suppliers must meet criteria listed below unless otherwise authorized by the Architect.
   1. The Pervious Portland Cement Concrete Installation Contractor shall meet one of the following criteria:
      a. One (1) National Ready Mixed Concrete Association (NRMCA) Certified Pervious Concrete Craftsman must be onsite, overseeing each placement crew during all pervious concrete placements, or
      b. Three (3) NRMCA Certified Pervious Concrete Installers must be onsite, working as members of the placement crew during all pervious concrete placements, or
      c. Three (3) NRMCA Certified Pervious Concrete Technicians and one (1) NRMCA Certified Pervious Concrete Installer shall be on site working as members of the placement crew during all concrete placements, or
      d. If the concrete installer has insufficient experience with pervious concrete pavements (less than three (3) successful jobs and/or does not hold the appropriate NRMCA Pervious Concrete certifications), or if the installer has not installed pervious concrete within the previous six (6) months, the concrete installer may retain (at their expense) an authorized Pervious Concrete supervisor who meets the certification requirements. The supervisor must be onsite, overseeing each placement crew during all pervious concrete placements, or
      e. Verification of current NRMCA certification and evidence of three (3) successful pervious concrete pavement jobs with a combined minimum of 5,000 square feet of pervious concrete pavement, ,and the contract information and addresses for three (3) of those projects.

2. The Pervious Portland Cement Concrete Supplier shall meet all of the following criteria
    a. Have at least one NRCMA Certified Pervious Concrete Technician on the job with authority over the loading, dispatching and transportation of the pervious concrete.
    b. Have completed a minimum of five (5) successful pervious concrete projects with at least one of those occurring within the previous six months.
    c. Verification of current NRMCA certification and evidence of five (5) successful pervious concrete projects, and the contract information and addresses for those projects.
    d. If the concrete supplier has insufficient experience with pervious concrete pavements (less than five (5) successful jobs and/or does not hold the appropriate NRMCA Pervious Concrete Technician certifications), or if the supplier has not supplied pervious concrete within the previous six (6) months, the concrete supplier may retain, at their expense, an authorized pervious concrete supervisor to monitor preparations, batching, and transporting operations. This authorized supervisor shall be present for all pours including the sample panel.

B. The installer shall use an adequate number of skilled pervious crew workers with pervious concrete experience who are thoroughly trained and experienced in the necessary craft and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

C. Test Panels:
1. Contractor is to place, joint, and cure one test panel each to be a minimum of 225 square feet at the required project thickness to demonstrate to the Owner's Representative's satisfaction that in-place unit weights can be achieved and a satisfactory pavement can be installed at the site location.
2. Test panels may be placed at any of the specified Portland cement pervious locations. Contractor will engage a qualified independent testing agency to perform thickness testing of the test panels in accordance with ASTM C 42; void structure in accordance with ASTM C 138; and for core unit weight in accordance with ASTM C 140, paragraph 9.3.
3. Satisfactory performance of the test panels, based on the average of three cores of each test panel, will be based on the following criteria. The project engineer has final authority to determine compliance.
    a. Average thickness within no less than ¼-inch of specified thickness, with no single core exceeding ½-inch less than the specified thickness; nor shall the average compacted thickness be more than 1-1/2-inch more than the specified thickness.
    b. Unit weight plus or minus 5 pcf of the design unit weight.
    c. Void Structure: 15% minimum; 25% maximum.
4. If the test panel is outside one or more of the above mentioned limits, the test panel shall be removed at the contractor's expense and disposed of in an approved landfill and replaced at the contractor's expense.

5. If the test panel meets the above-mentioned requirements, it may be left in-place and included in the completed work.

1.7 PROJECT CONDITIONS

A. Protection of existing improvements:
   1. Protect adjacent work from splashing of paving materials. Remove all stains from exposed surfaces of paving, structures, and grounds. Remove all waste and spillage.
   2. Do not damage or disturb existing improvements or vegetation. Provide suitable protection where required before starting work and maintain protection throughout the course of the work.
   3. Restore damaged improvements, including existing paving on or adjacent to the site that has been damaged as a result of construction work, to their original condition or repair as directed and to the satisfaction of the design professional of record.

B. Safety and traffic control:
   1. Notify and cooperate with local authorities and other organizations having jurisdiction when construction work will interfere with existing roads and traffic.
   2. Provide temporary barriers, signs, warning lights, flagmen, and other protections as required to assure the safety of persons and vehicles around the construction area and to organize the smooth flow of traffic.

C. Weather limitations:
   1. Do not place pervious concrete pavement when the ambient temperature is below 40 degrees F or above 80 degrees F, unless otherwise permitted in writing by the design professional of record.
   2. Do not place pervious concrete pavement when the wind, heat, or humidity does not allow enough time to place, properly joint, compact, edge, finish and cure before the surface dries and is no longer workable without damaging the surface.

PART 2 - PRODUCTS

2.1 CONCRETE MIXTURES

A. The mix design shall include:
   1. Mix identification name or number.
   2. Cementitious materials by amount and type per cubic yard.
   3. Water/cement ratio.
   4. Aggregate amounts by weight per cubic yard.
      a. Aggregate void content as determined by ASTM C29.
   5. Admixtures type by product name and per cubic yard used.
   6. Unit weight of the mix as determined in accordance with ASTM C1688.
   7. Target finished voids (by percent) of the pervious mix as determined by ASTM C 1688.
   8. Integral color, if used, shall include brand, color, and dosage rate.

2.2 CONCRETE MATERIALS

A. Cementitious material: use the following cementitious materials, of same type, brand, and source throughout the project:
   1. Portland cement Type I or II conforming to ASTM C 150.
   2. Portland cement Type IP or IS conforming to ASTM C 595.

B. Fly Ash Type C or F at 25% maximum replacement for Portland cement.

C. Slag at 30% maximum replacement for Portland cement.

D. Aggregate:
   1. Aggregate source must meet minimum hardness standards to comply with State Highway Department requirements, or other local jurisdictional requirements, whichever is greater.
   2. Use an aggregate that will provide a smooth enough finish such that surface uniformity shall be satisfactory to the owner for the use of wheeled carts such as a shopping cart through the placement. Surface must still provide sufficient porosity to allow for it to readily and uniformly infiltrate stormwater.
   3. The aggregate must be a crushed rock, washed, clean and free of other contaminants.
   4. Aggregate must contain a minimum void content of 38% as determined by ASTM C 29.
   5. Nominal maximum aggregate size shall not exceed 1/3 of the specified pavement thickness.

E. Admixtures:
   1. Admixtures must comply with ASTM C 494 and be approved by the design professional of record.
   2. All admixtures shall be used per manufacturer's recommendations.

F. Water: clean, potable water shall be used per ASTM C 1602.

G. Proportions:
   1. Total cement material not to exceed 564 lbs. per cubic yard, unless approved by the design professional of record, as a result of aggregate void content.
   2. Mix design shall be based upon the percent of voids of the coarse aggregate in order to determine the proper amount of cement or cementitious materials used to achieve proper coating of coarse aggregate particles and surfaces to meet specified void contents of the pervious mix.
   3. Slag cement (25%) or Fly Ash (25%) may be used to replace Portland cement unless otherwise authorized and approved by the engineer.
   4. The volume of aggregate, cement, water, and admixture per cubic yard calculated as a function of the unit weight as determined by ASTM C 1688 Standard Test for Density and Voids Content of Freshly Mixed Pervious Concrete must result in a yield of 27 cubic feet per cubic yard.
   5. The unit weight per cubic yard of the concrete shall me plus or minus 5 lbs. of the design unit weight

6. The water/cement ratio shall be such that the cement paste displays a wet metallic sheen when floated with a magnesium hand float without causing the paste to flow from the aggregate or seal the surface.
7. Voids: 15% to 25% complying with ASTM C 1688.
8. Fibers: the use of fibers in pervious concrete mixtures is permitted when approved by the engineer.

H. Isolation joint material: comply with ASTM D 994, D 1751, or D1752.

I. Make forms with steel, word, or other materials that are sufficiently rigid to maintain specified tolerances, and capable of supporting concrete and mechanical concrete placing equipment. Forms shall be clean and free of debris of any kind.

2.3 TRANSPORTATION METHODS

A. Standard Ready Mix Concrete Trucks:
1. Unless authorized in writing by the pervious consultant or a certified installer, truck mixers shall load using only enough revolutions per minute to load the truck.
2. After loading, mix for 10 minutes before leaving the plant.
3. Hot water (defined as temperatures in excess of water out of a well or municipal source) is not to be used in the mix or in the side tanks on the mixers, even in cold weather.

B. Hauling and delivery:
1. Pervious concrete delivered via ready mix truck must be treated with hydration stabilizing admixture to allow for two hours of working time after loading, unless otherwise authorized by the design professional of record, and the concrete temperature shall not exceed 90 degrees F.
2. Trucks used to transport pervious concrete shall rinse and dump all contents including rinse water before loading and re-loading pervious concrete mix.

C. Discharge:
1. Prior to discharge of each load, installer shall inspect each load for appearance and conformity to specifications.
2. Water may be added at the job site to obtain the required mix consistency. Any water adjustments made at the job site shall be made by the certified pervious concrete installer. Document any water adjustments by time and location of placement prior to discharge.
3. Loads that cannot be adjusted on-site to meet specifications shall be rejected.
4. Concrete shall be deposited as close to its final position as practicable such that fresh concrete enters the mass of previously placed concrete.
5. Minimize the practice of discharging onto sub-grade and pulling or shoveling to final placement.

D. Volumetric (Truck Mounted Mobile Mixers) may be used for delivery and mixing pervious concrete provided:
1. The truck must be calibrated to the design mix specified.

2. The certified pervious installer is allowed to adjust the mix design to meet moisture requirements of the specification.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Notification Requirements:
   1. The design professional of record shall be notified forty eight (48) business hours in advance of subgrade preparation, recharge bed installation, and all pervious concrete pours (including ample time for travel to reach the site) to inspect or send a representative to inspect subgrade preparation, recharge bed installation, and all pervious concrete pours.
   2. A pre-paving conference shall be scheduled and held prior to installation of the sample panel. Two weeks notice is preferred by shorter notice allowed if approved by the design professional of record. The following individuals are required to attend:
      a. Concrete supplier.
      b. Pervious Concrete contractor
      c. Site work contractor.
      d. Project foreman.
      e. Design professional of record or authorized representative of design professional of record.
      f. Testing lab representative certified by NMRCA or familiar with pervious pavement test standards.

B. Subgrade preparation:
   1. It is essential that the permeability of the underlying native soils be preserved. DO NOT OVER COMPACT. Uniform compaction of cuts and fills are required. Verify percolation rates in accordance with ASTM D 3385 prior to placement of storage aggregate to verify porosity. Protect pervious pavement areas from excessive construction equipment to prevent over compaction.
   2. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 3 inches with a York rake or equivalent and light tractor.
   3. Where subgrade has been compacted due to construction traffic, subgrade shall be scarified or removed to a depth sufficient to match the naturally occurring insitu state. Add additional base course material to meet design grades at no cost to the owner.
   4. Bring subgrade of base course to line, grade, and elevations indicated. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of stone.

C. Pervious Base Aggregate:
   1. Base Aggregate Material:

a. Base material shall be composed of uniform sized aggregate with a minimum size number five (1 inch – ½ inch). The aggregate should have at least 40% voids unless otherwise specified by civil or geotechnical contract documents. Use of local aggregates outside of the noted size range that provide 40% voids may be approved by the engineer.

2. Before placement of the pervious concrete begins, the pervious concrete contractor shall inspect the in-place base aggregate for compliance to the plans and specifications as follows:
   a. Drainage fabric is properly secured at least sixteen (16) inches outside of bed, or per the design documents, whichever is greater, as recommended by fabric manufacturer.
   b. When the pervious concrete abuts a building face or interfaced with asphaltic concrete pavement, an impervious barrier shall be installed to prevent water from seeping from the re-charge bed into adjacent base materials or structures. Approved barriers may include:
      1) An impermeable pond liner properly installed to prevent flow from the aggregate base.
      2) Flush curbs place onto impermeable soil or used in conjunction with a waterproof liner.
      3) Any barrier chosen by the design professional of record to isolate the adjacent structure.
   c. The base must be compacted to an acceptable level as approved by the design professional of record.
   d. Test the base aggregate for permeability after compaction by double ring infiltrometer or other suitable test of subgrade soil permeability.
   e. Base rock temperature and moisture control:
      1) Two to twelve hours prior to placing concrete, and immediately prior to the pour, the re-charge bed shall be soaked with water to minimize effect of dry or hot aggregate from drawing moisture out of the plastic concrete. The design professional of record may waive this requirement in wet conditions.
   f. Contractor to review all plans to determine placement of all other elements of the design (i.e. conduits, drainage pipes, utilities, irrigation sleeves, etc.) prior to placing concrete.
   g. All joints are to be clearly marked on the forms or base rock prior to placement. Radius joint between forms shall be painted on the base rock before placement begins.
   h. Contractor must follow the submitted and approved “jointing plan” unless approved in writing by the design professional of record.
   i. Joints should not exceed fifteen (15) feet in either direction with the larger dimension of a panel not exceeding 125% of the smaller panel.

D. Pervious Concrete Placing Equipment:
   1. A motorized “Spinning Screed” like a Bunyan or approved equal, may be used to screed the pervious pavement. No riser strip is required providing the concrete mix is still at grade after compaction using an approved pervious cross roller. If the mix finished below grade, a riser of sufficient thickness to shim the screed to grade after compaction will be required.

2. A hand operated straight edge or motor powered Truss Screed may be used but both require the use of riser strips and static rolling prior to cross rolling. Thickness must be adequate to maintain finished grade after compaction. Typically the riser strip thickness of ¼-inch to 3/8-inch is required.

E. Approved Hand Tools:
1. The pavement must be compacted using a riser strip unless the screed used provides enough compaction that no loss of elevation occurs after secondary "cross rolling".
2. An approved pervious concrete "Cross" roller capable of applying a minimum weight of 40 lbs/LF.
3. A steel "Static" roller weighing a minimum of 40 lbs/LF, fitted with handles on each end, capable of spanning the full width of the fresh placement is allowed but only if riser strips are used to strike off the freshly placed mix higher than finished grade and compacted back to final grade immediately after the riser strips are removed.
4. Use of asphalt rollers or plate compactors are not allowed, unless it can be demonstrated that they will not seal the voids, prevent raveling and do not result in uneven surfaces. Use of such tools must be approved in writing by the design professional of record.
5. A weighted steel or Magnesium float may be used in conjunction with other hand tools to remove roller marks and improve the appearance of the pavement surface provided it does not seal the surface or reduce the permeability below acceptable rates of infiltration.
6. Hand floats and other tools typical to concrete finishing may be used but only if they do not seal the surface, reduce permeability below acceptable rates of infiltration, or result in a slippery surface texture.
7. Walking edgers, deep jointers, and hand edgers with specified radius. If no radius is specified the installer may use either a ½-inch or 5/8-inch radius as long as all edgers used on the job match.
8. Deep jointers, Pervious "Pizza" Style Cutters may be used as long as the joint radius leaved no torn or ragged edges. Deep groove jointers should not be used to "finish" the joint radius, since deep groovers often leave ragged or torn edges. Touch up may be necessary to dress the edge after deep grooving with steel groovers or hand tools.
9. Groover, a steel tool with a groove cast or attached, may be used to touch up edges after deep jointing. USE OF ALUMINUM GROOVERS IS NOT RECOMMENDED UNLESS THE INSTALLER CAN DEMONSTRATE THE TOOL DOES NOT RESULT IN TORN SURFACES OR RADIUS EDGES.

F. Placing, Compaction, Jointing, and Finishing Process:
1. Pervious concrete sidewalk shall be constructed using side forms. Slip form paving will not be allowed. Forms shall be made of steel or wood and shall be in good condition, clean, and be capable of being anchored in place so they will be true to grade, line, and slope. Forms that are bent, warped or unclean shall not be used.
2. Pervious materials shall be placed on the ground as close as possible to its final location. Avoid piling and dragging into place when possible.

3. Take care to accurately strike off the surface using a “riser strip” that allows for compaction to final grade.
4. Immediately after initial strike off, remove the riser strip and compact to grade using a static roller and/or an approved pervious cross roller.
    a. Control (contraction) joints shall be installed at intervals of a maximum of 15 feet or as indicated by plans. They shall be installed at a depth of ¼ the thickness of the pavement.
    b. The larger horizontal dimension of a slab panel shall not exceed 125% of the small dimension.
    c. The angle between two intersecting joints shall be between 80 and 100 degrees.
    d. Align joints of adjacent pavement panels.
    e. Joints shall intersect pavement free edges at 90-degree angles and shall extend straight for a minimum of 1-1/2 feet from the pavement edge where possible.
    f. Transverse construction joints shall be installed whenever placing is suspended a sufficient length of time that concrete may begin to harden. If contractor attempts to “blend” a fresh pour into an earlier pour “RAVELING” will occur. Minimize the time between loads to reduce this “accidental cold joint”.
    g. Isolation (expansion) joints will not be used except when pavement is abutting slabs or other adjoining structures. Extend the isolation joints through the full depth of the pavement. Fill the entire isolation joint with isolation joint material.
    h. If transverse or isolation joints are used, or where pervious concrete meets impervious pavement, extra compaction may be necessary.
5. Deep groove contraction joints must be installed immediately after compaction, unless the installer chooses to wet cut the contraction joints in three steps:
    a. Deep groove immediately after screeding.
    b. Compact with static roller.
    c. Touch up radius with steel groover after compaction to dress the radius.
6. All wet cut joints and edges shall be tooled into the pavement without delay. Time is of the essence. Jointing without delay aids in the ease of installation and the durability of the tooled edge.
7. All wet cut edges and cold joint edges must have an approved ½-inch or 5/8-inch radius edger unless otherwise specified. A radius edge is also required next to curbs and next to sawn joints.
8. If the surface or edges are “torn” or not otherwise uniform, immediately add fresh material to correct the appearance. Do not add material after the “sheen” has left the surface. Working with partially set paste (matte appearance as opposed to wet metallic) or un-compacted surface material will weaken the bond and increase the chance of raveling.
9. After cross rolling the surface a weighted finishing tool may be used to remove roller marks (if any) and to touch up the surface.
10. Avoid over-finishing of the surface to protect surface permeability. If material needs to be added or removed, make changes immediately and re-screed as needed.
11. Cold joints should be avoided if possible.

a. If a delay occurs that lasts long enough that the concrete is no longer workable (metallic sheen is lost), install a header and create a transverse construction joint, compact the edge of the new joint.
b. If the mix is cut back to a scheduled joint, excess concrete must be removed to allow at least three (3) inches of fresh mix on the surface. Use a straight edge and edging tool to make a tooled radius edges at the new joint.
c. During short delays, cover the pavement, including the face of the new edge, with plastic until fresh concrete arrives.
d. Use of a surface stabilizing agent is encouraged during delays. Stabilizers may be reapplied as long as the paste is not damaged.

12. Tolerances:
    a. Construct pavement to comply with the following tolerances:
        1) Elevation: +1/4 inch
        2) Thickness: +1/2 inch
        3) Contraction Joint Depth: +1/4 inch – 0 inch
        4) Surface: In any direction, the gap below a 10-feet unlevel straightedge shall not exceed 1/4-inch.

G. Curing Materials and Procedures:
1. Proper curing procedures require that fresh pervious concrete curing must begin within twenty (20) minutes after placement. In dry or windy conditions, curing must be started sooner and placing should be suspended if the wet metallic sheen cannot be maintained long enough to complete finishing operations.
2. The pavement surface must be covered with six millimeter polyethylene plastic sheeting or thicker or as approved by the design professional of record.
3. Black or clear sheeting may be used, but maintain the same type throughout the project.
4. The sheeting shall overlap all exposed edges at least 15-inches and shall be secured, without using dirt or stones smaller than the aggregate in the mix, to securely anchor the plastic for all weather conditions.
5. Sheeting with unrepaired holes or rips will not be allowed.
6. A fog or light mist may be sprayed using a low or medium solid hydration-stabilizing agent. Apply with a pressure sprayer above the surface as needed during high temperature, high wind, and low humidity.
7. Liquid curing compounds are not allowed as a replacement for curing plastic. Surface treatments for curing or other approved purposes are allowed in conjunction with curing plastic.
8. Internally cured mixed, if approved and used, must still be covered with plastic sheeting for a minimum number of hours as directed by the mix design. If the mix design does not specifically state that it is internally cured, assume that it is not.
9. Prevention of “Tiger Striping” (uneven surface discoloration from uneven curing caused by wrinkles and folds in the plastic or efflorescence during the curing process).
    a. Plastic shall be properly secured and in direct contact with pervious surface (wrinkly free) as much as practical.

b. To reduce “Tiger Striping” during hot weather, remove the plastic after 24 hours and thoroughly flush the surface with clean potable water. Replace and carefully re-secure the plastic after flushing.

c. Carefully inspect daily for air bubbles, blown or areas of loose plastic. Re-anchor securely. Re-hydrate areas where moisture has been lost due to blown, loose or otherwise compromised curing during the first seven days.

H. Cure Time:

1. If temperature remains at or above 55 degrees F for the duration of the cure:
   a. Pedestrian traffic may be allowed in 24 hours.
2. At temperatures below 55 degrees F, curing time must be extended before opening to traffic. The extra time needed before opening to traffic is to be approved by the design professional of record.

3.2 PAVEMENT PROTECTION: DURING CONSTRUCTION/BEFORE ACCEPTANCE

A. The general contractor must ensure all trades, especially landscapers, do not dump fine materials such as dirt or bark on the pervious concrete.

1. The general contractor must protect the pavement from other trades who use the pavement for staging, storage, or other reasons.
2. Protect the pavement surface from abrasion, discoloration, or sediments by covering with a geotechnical fabric. This fabric must be properly anchored and maintained in place starting when the curing plastic is removed and remaining until completion of any construction or landscaping activity that may expose the pavement to hazards.
3. It is the general contractor’s responsibility to remove and pay for replacement costs of surface damage for causes out of the control of the installer.

B. At the completion of the job, loose construction “crumbs” left on the surface of the pavement shall be flushed off the surface of the pavement just prior to substantial completion by the general contractor unless otherwise specified within the contract.

1. A water truck to flush the loose material, using a high volume, low pressure water flow, is the preferred method to clean the pavement.

C. The general contractor shall be responsible to clean, repair and touch-up, or replace when directed, pavement which has been soiled, discolored, or damaged by other trades prior to substantial completion.

3.3 REPAIRS

A. Remove and replace pavement sections that fail to meet standards established and approved by the Owner. Unless otherwise authorized by the design professional of record, remove the entire section at no expense to Owner at the nearest joint.

B. Patching small areas may be allowed if the installer uses the exact mix design with the same ingredients and cement supplier and can demonstrate the patch will match the appearance and performance of the existing pavement after the replacement pavement

has cured. Minor color differences are to be expected and are not a basis for rejecting patching.

C. If the pavement has been clogged with construction debris or other sediment, clean the pavement and retest. If the pavement is slow draining because of improper mix design or installation techniques, remove and replace the section of pavement that is not compliant with the specifications at the nearest joint at no cost to the owner.

3.4 MAINTENANCE/CLEANING AFTER CONSTRUCTION AND ACCEPTANCE OF WORK

A. The Owner is responsible for all maintenance after construction and project work acceptance. The contractor must supply the Owner with a copy of the pervious concrete Owner's Manual and Maintenance Guide.

3.5 TESTING

A. Laboratory testing shall be completed by an accredited laboratory or as approved by the design professional. Contractor shall provide all third party testing.

B. Fresh Pervious Concrete:
   1. A unit weight test using ASTM C 1688 shall be taken from the first load of the project to verify the mix design used is accurate. At the discretion of the design professional of record, additional tests for each day's placement of pervious concrete in accordance with ASM C 1688 to verify unit weight may be conducted. Note: Comparison of ASTM C 1688 and ASTM C 140 tested voids won't match.
   2. If the unit weight is out of compliance with specifications, the testing laboratory shall notify the installer immediately after discovery. The installer must correct the deficiency before work can continue and the testing laboratory must confirm the correction has been made and conforms to design standards.
   3. A representative sample of the fresh mix shall be taken from the sample load and the first load of the project. This sample must immediately be flushed of cement slurry to visually confirm the aggregate reasonably meets size or fracture requirements. If the aggregate is in question, the pour shall be suspended until the mix can be confirmed as meeting the specification.

C. Hardened Pervious Concrete:
   1. Permeability shall be tested using ASTM C 1701 or an approved equal.
      a. Must be tested on clean, level pervious pavement upon removal of the curing plastic and accepted before opening the pavement to traffic.
      b. Permeability shall be tested at least 100 inches per hour immediately after curing plastic is removed.
      c. If less than six (6) inches of open graded base rock is used under the pavement the permeability rate will not be valid and the permeability rate shall not be used for criteria for acceptance or rejection of the pavement.
      d. The design professional of record is authorized to determine permeability on slopes.

2. Core Testing:
    a. The design professional of record may specify the need for core samples of the hardened concrete. No cores may be taken in the first seven days after placement.
    b. If cores are required the cores shall be measured for thickness only. Untrimmed, hardened core samples may be used to determine placement thickness. The average of all cores shall not be less than the specified thickness with any individual core being more than ½ inch less than the specified thickness.

3.6 ACCEPTANCE

A. Completed work that meets the standards approved in the sample panel shall be approved.

END OF SECTION 32 13 43

SECTION 32 16 00

CURBS, GUTTERS, SIDEWALKS, AND DRIVEWAYS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Curbs.
   2. Sidewalks.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
   1. Cementitious materials.
   2. Admixtures
   3. Curing compounds
   4. Applied finish materials.
   5. Bonding agent or epoxy adhesive.
   6. Joint fillers.

1.3 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. ACI Publications: Comply with ACI 301 unless otherwise indicated.

1.4 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
   1. Use flexible or curved forms for curves with a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185 fabricated from as-drawn steel wire into flat sheets.

C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497 flat sheet.

D. Reinforcing Bars: ASTM A 615 Grade 60; deformed.

E. Plain-Steel Wire: ASTM A 82 as drawn.

F. Deformed-Steel Wire: ASTM A 496.

G. Tie bars: ASTM A 615 Grade 60, deformed.

H. Bar supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.
   1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
   2. For epoxy-coated reinforcement, use epoxy-coated or other dialectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150, gray portland cement Type I
      a. Fly Ash: ASTM C 618, Class C.

B. Normal-Weight Aggregates: ASTM C 33, Class 4M, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Detectable warnings: ADA truncated domes aligned in a square or radial grid pattern complying with current ADAAG guidelines. Detectable warnings shall be either precast pavers plastic cast-in-place pavers or plastic adhesive surface applied tile.
1. Color: Yellow
2. Size: Nominal 12 inch x 12 inch
3. Thicnkess: [2 inch (51mm)] [other].
4. Manufacturers: [Tile Tech], [Armor Tile], [ADA Solutions], [other] or approved equal.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:
   1. Compressive Strength (28 Days): 3000 psi.
   2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
   3. Slump Limit: 4 inches, plus or minus 1 inch.
   4. Air Content: 4-1/2 percent plus or minus 1.5 percent for 1-inch nominal maximum aggregate size.

B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Furnish batch certificates for each batch discharged and used in the Work.
   1. When temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading and elevation tolerances. See Section 31 20 00 “Earth Moving.”

B. Remove loose material from compacted subbase surface immediately before placing concrete.

C. Proceed with concrete operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of the concrete structure and at locations where concrete operations are stopped for more than one-half hour unless the structure terminates at isolation joints.
   1. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Expansion Joints:
   1. Construct expansion joints of the preformed filler type in concrete structures as shown and the following:
      a. Not less than ½ inch wide, except where abutting or underlying concrete joints are larger, then the width shall match those joints.
      b. At right angles to the structure alignment and normal to the structure surface.
      c. Which completely separate the concrete segments.
      d. Placed flush or no more than 1/8 inch below the concrete surface.
   2. Curbs, Islands, and Traffic Separators: provide expansion joints:
      a. Opposite abutting expansion joints in abutting concrete.
      b. Over existing expansion joints in concrete underlying the new concrete structure.
      c. At each point of tangency in the structure alignment.
      d. Not over 200 foot spacing.
   3. Walks, Monolithic Curbs and Sidewalks, and Surfacing. Provide expansion joints:
      a. Between driveways and concrete pavement.
      b. Transversely in walks opposite expansion joints in adjoining curbs and elsewhere so the distance between joints does not exceed 45 feet.
      c. Transversely in walks at a distance of 16 feet to 8 feet from ends of walks which abut curbs.
      d. Around poles, posts, boxes, and other fixtures which protrude through or against the structures.

D. Contraction Joints. Construct transverse contraction joints of the weakened plane or dummy type in the exposed surfaces of the concrete structures as shown and the following:
   1. Locations. Locate contraction joints:
      a. Over contraction joints in concrete underlying the new concrete structure.
      b. Opposite contraction joints in abutting concrete.
      c. At locations to confine joint spacing to a maximum of 15 feet.
   2. Methods. Construct contraction joints by:
      a. Inserting and removing plates, or other devices.
      b. Inserting and leaving in place preformed expansion joint filler even and flush with the concrete surface.
      c. Sawing as soon as practical after concrete placement but before any uncontrolled cracking occurs.
      d. Tooling.

e. Other approved methods.

3. Requirements. Contraction Joints shall:
   a. Be not less than 1/8 inch or more than ¼ inch wide.
   b. Be a depth of one-third the thickness of the concrete.
   c. Have clean, unfilled grooves (if preformed expansion joint filler is not used).

3.4 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, placing, and consolidating concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
   1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating joint devices.

H. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

I. Screed paving surface with a straightedge and strike off.

J. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

K. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

L. Remove forms after the concrete has taken its initial set and while the concrete is still green. Repair minor defects 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 added cost to the Owner. While the concrete is still green, the exposed surfaces shall be finished by rubbing down high spots and form marks, by rubbing the moistened surfaces with a suitable device to provide a uniform texture and smooth surface, or by applying and rubbing a thin cement grout to produce a uniform color.

M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

N. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.5 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

C. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a ¼ inch (6mm) radius. Repeat tooling of edges after applying surface finished. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows.
   1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.7 CONCRETE TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:
   1. Elevation: ¼ inch.
   2. Thickness: Plus 3/8 inch, minus 1/4 inch.
   3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/4 inch.
   4. Joint Spacing: 1/2 inch.
   5. Contraction Joint Depth: Plus 1/4 inch, no minus.
   6. Joint Width: Plus 1/8 inch, no minus.

3.8 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Protect concrete structures from damage. Exclude traffic from structures for at least 14 days after placement. When construction traffic is permitted, maintain structures as clean as possible by removing surface stains and spillage of materials as they occur.

C. Maintain concrete structures free of stains, discoloration, dirt, and other foreign material. Sweep sidewalk not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 16 00

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Furnish labor, material and equipment required for the installation of water-distribution piping and related components for water service.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Valves and accessories
   2. Backflow preventers and assemblies.
   3. Pipe.

B. Field quality-control test reports.

C. Operation and maintenance data for the following:
   1. Valves
   2. Backflow preventers

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with requirements of utility company supplying water.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

D. NSF Compliance:
   1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
   2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.4 PROJECT CONDITIONS

A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:

1.5 COORDINATION

A. Coordinate installation of water meter with City of Milwaukie.

PART 2 PRODUCTS

2.2 PIPE AND FITTINGS

A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
   1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

B. PVC Schedule 40 Pipe: STM D 1785.
   1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.

2.3 JOINING MATERIALS

A. Brazing Filler Metals: AWS A5.8, BCuP Series.

B. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

C. Soldering Flux: ASTM B 813, water-flushable type.

D. Solder Filler Metal: ASTM B 32, lead-free type with .20 percent maximum lead content.

2.4 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.5 GATE VALVES

A. Bronze Gate Valves:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Crane Co.; Crane Valve Group; Crane Valves.
      b. Crane Co.; Crane Valve Group; Jenkins Valves.
      c. Crane Co.; Crane Valve Group; Stockham Div.
      d. Hammond Valve.
      e. Milwaukee Valve Company.
      f. NIBCO INC.
      g. Red-White Valve Corporation.
      h. Approved equal.
   2. Nonrising-Stem Gate Valves:

a. Description: Class 125, Type 1, bronze with solid wedge, threaded ends, and malleable-iron handwheel.
1) Standard: MSS SP-80.

2.6 BACKFLOW PREVENTERS

A. Double-Check, Backflow-Prevention Assemblies:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Ames Fire & Waterworks; a division of Watts Regulator Co.
b. Conbraco Industries, Inc.
c. FEBCO; SPX Valves & Controls.
d. Flomatic Corporation.
e. Watts Water Technologies, Inc.
f. Wilkins; a Zurn company.
2. Standard: AWWA C510.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: 5 psig maximum, through middle 1/3 of flow range.
5. Size: 2”
6. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
7. Configuration: Designed for horizontal, straight through flow.
8. Accessories: Ball valves with threaded ends on inlet and outlet of NPS 2 and smaller;

PART 3 EXECUTION

3.2 EARTHWORK

A. Refer to Section 31 20 10 "Earth Moving - Utilities" for excavating, trenching, and backfilling.

3.3 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.

C. Do not use flanges or unions for underground piping.

D. Flanges, unions, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

E. Underground water-service piping NPS 3/4 to NPS 3 shall be:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
2. PVC, Schedule 40 socket fitting; and solvent-cemented joints.

3.4 VALVE APPLICATIONS

A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.

B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
   a. Gate Valves, NPS 2 and Smaller: Bronze, nonrising stem.

3.5 PIPING INSTALLATION

A. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.

B. Bury piping with depth of cover over top at least 36 inches with top at least 12 inches below level of maximum frost penetration unless otherwise indicated.

3.6 JOINT CONSTRUCTION

A. Make pipe joints according to the following:
   1. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
   2. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

3.7 VALVE INSTALLATION

A. Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

3.8 BACKFLOW PREVENTER INSTALLATION

A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

B. Do not install backflow preventers that have relief drain in vault or in other spaces subject to flooding.

C. Do not install bypass piping around backflow preventers.

3.9 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect water-distribution piping to existing water meter.

3.10 FIELD QUALITY CONTROL

A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
   1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Prepare reports of testing activities.

3.11 CLEANING

A. Clean and disinfect water-distribution piping as follows:
   1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
   2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
   3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
      a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
      b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
      c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
      d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION 33 11 00

SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes gravity-flow nonpressure storm drainage outside the building, with the following components:
   1. Cleanouts.
   2. Dry wells.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Cleanouts.
   2. Dry well.

B. Field quality-control reports.

1.3 PROJECT CONDITIONS

A. Site Information: Research public utility records, and verify existing utility locations prior to ordering any materials. Notify Landscape Architect immediately if any discrepancies are found in the project Survey.

PART 2 PRODUCTS

2.1 Refer to Part 3 “Piping Applications” for applications of pipe, fitting, and joining materials.

2.2 GRAVITY SEWER PIPE AND FITTINGS

A. See section 33 46 00 Subdrainage.

2.3 CLEANOUTS

A. Plastic Cleanouts:
   1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.4 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.5 DRY WELLS

A. Description: ASTM C 478, precast, reinforced, perforated concrete rings. Include the following:
   1. Diameter: 48 inches minimum, unless otherwise indicated.
   2. Wall Thickness: 5 inches minimum with perforations arranged in rows parallel to axis of ring. Contractor is required for sizing wall and riser sections based on soil bearing pressure.
   3. Perforations: 4-inch x 1 1/2-inch tapered or 2 3/8-inch diameter holes evenly distributed.
   4. Ring Construction: Designed to be self-aligning.
   5. Base Section: 6-inch minimum thickness for floor slab and 5 inches base riser section, and having separate base slab or base section with integral floor. Contractor is responseible for sizing base riser and floor based on the actual soil bearing pressure.
   6. Riser Sections: 5-inches minimum thickness, and lengths to provide depth indicated. Contractor is responsible for sizing base riser and floor based on the actual soil bearing pressure.
   7. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone size that matches grade rings.
   8. Gaskets: ASTM C 443 rubber.
   9. Grade Rings: Include two or three reinforced-concrete rings, or 6- to 9-inch total thickness, that match 24-inch diameter frame and cover.
   10. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
   11. Dry Well Filter Material: ASTM D 448, Size No. 24, 3/4- to 2 1/2-inch washed crushed stone or gravel.

2.6 GEOSYNTHETIC FABRIC

A. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
   1. Grab Tensile Strength: 110 lbf; ASTM D 4632.
   2. Tear Strength: 40 lbf; ASTM D 4533.
   3. Puncture Resistance: 50 lbf; ASTM D 4833.
   4. Water Flow Rate: 150 gpm per sq. ft; ASTM 4491.
   5. Apparent Opening Size: No. 50; ASTM 4751.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 31 20 10 "Earth Moving Utilities." Install tracer wire directly over piping and at outside edges of underground structures.

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

D. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process or microtunneling.

E. Install gravity-flow, nonpressure drainage piping according to the following:
   1. Install piping pitched down in direction of flow at a minimum slope of 0.5 percent, unless otherwise indicated.
   2. Install piping with 36-inch minimum cover, unless otherwise indicated.
   3. Install PE corrugated sewer piping according to ASTM D 2321.
   4. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
   5. Install piping below frost line.

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:
   1. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
   2. Join PVC corrugated sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints.
   3. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.4 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to terminate between 4 and 8 inches from finished grade. Use PVC fittings in sewer pipes at branches for cleanouts

and PVC pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.

B. Set cleanout with meter box covers in earth, as indicated on plans. Set with tops flush with surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.5 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.6 DRYWELL INSTALLATION

A. Excavate hole to diameter of at least 18 inches greater than outside of dry well. Do not extend excavation into ground-water table.

B. Install precast, concrete-ring dry wells according to the following:

1. Install complete with appurtenances and accessories indicated.
2. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.
3. Install precast concrete manhole sections with gaskets according to ASTM C 891.

3.7 CONNECTIONS

A. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
3. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

B. Pipe couplings and expansion joints with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
    a. Shielded flexible couplings for same or minor difference OD pipes.

b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.

c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

3.8 IDENTIFICATION

A. Install green tracer wire directly over piping and at outside edges of underground structure. 12 AWG minimum solid copper insulated High Molecular Weight Polyethylene (HMW PE) tracer wire or approved equal. The tracer wire insulation shall be green for sewer pipe and be a minimum of 45 mil. thick. Joints or splices shall be waterproof. The wire shall be rated for 30 Volt.

3.9 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

END OF SECTION 33 41 00

SECTION 33 46 00

SUBDRAINAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes subdrainage systems for play areas and planters:
   1. Perforated-wall pipe and fittings.

1.2 SUBMITTALS

A. Product Data:
   1. For geotextile filter fabrics.
   2. Perforated pipe.
   3. Solid-wall pipe.
   4. Perforated panel pipe

B. Inspection report.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

A. Refer to Part 3 “Piping Applications” for applications of pipe, fitting, and joining materials.

2.2 PERFORATED-WALL PIPES AND FITTINGS

A. Perforated schedule 40 ABS Pipe and Fittings: ASTM F628 or D2661, solvent welded joints.

B. Perforated schedule 40 PVC Sewer Pipe and Fittings: ASTM D 1785, D2665 or F891, solvent welded joints.

2.3 SOLID-WALL PIPES AND FITTINGS

A. ABS Schedule 40 Pipe and Fittings: ASTM D 1527, D 2611, F 1488, or F628 with solvent welded fittings per ASTM D 2661.

B. PVC Schedule 40 Sewer Pipe and fittings: ASTM D 1785, F 1488, or D2665 with solvent welded fittings (ASTM D 2665, or DF 1866).

2.4 PERFORATED PANEL PIPE AND FITTINGS

A. ADS AdvanEDGE panel pipe and fittings or approved equal.

2.5 SPECIAL PIPE COUPLINGS

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of the same sizes as piping to be joined and corrosion-resistant metal tension band and tightening mechanism on each end.

2.6 CLEANOUTS

A. PVC Cleanouts: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

B. Cast Iron Cleanouts: ASME A112.36.2M; with rounded flanged, cast iron housing and secured, scoriated, medium duty loading class, cast iron cover; including cast iron ferrule and countersunk, brass cleanout plug.

2.7 SOIL MATERIALS

A. Backfill, drainage course, and satisfactory soil materials are specified in Division 31 Section 31 20 10 "Earth Moving - Utilities."

2.8 GEOTEXTILE FILTER FABRICS

A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.

B. Structure Type: Nonwoven, needle-punched continuous filament.
   1. Style(s): Flat and sock.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section 31 20 10 "Earth Moving - Utilities."

3.2 PIPING APPLICATIONS

A. Underground Subdrainage Piping:
   1. Perforated PE pipe and fittings, couplings, and coupled joints.
   2. Perforated PVC sewer pipe and fittings for loose, bell-and-spigot joints.
   3. Perforated panel pipe and fittings, couplings and coupled joints.

B. Header Piping:
   1. PE Drainage tubing and fittings, couplings, and coupled joints.
   2. PVC sewer pipe and fittings, couplings and coupled joints.

3.3 CLEANOUT APPLICATIONS

A. In Underground Subdrainage Piping:

1. At Grade in Earth: PVC Cleanouts.
2. At Grade in Pave Areas: PVC cleanouts.

3.4 DRAINAGE INSTALLATION

A. Lay flat-style geotextile filter fabric in trench and overlap trench sides.

B. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.

C. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.

D. Install drainage piping as indicated in Part 3 "Piping Installation".

E. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests. Refer to Part 3 “Field Quality Control.”

F. After satisfactory testing, cover drainage piping to width of at least 6 inches on side away from footing and above top of pipe to within 12 inches of finish grade.

G. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.

H. Install panel pipe per manufacturer’s recommendations.

3.5 PIPING INSTALLATION

A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
1. Install Piping pitched down in direction of flow, at a minimum slope of 0.5 percent.
2. Lay perforated pipe with perforations down.
3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.

B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

C. Install PE piping according to ASTM D 2321.

D. Install PVC piping according to ASTM D 2321.

3.6 PIPE JOINT CONSTRUCTION

A. Join PE pipe, tubing, and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties."

B. Join perforated PE pipe and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4 "Joint Properties"; or according to ASTM D 2321 with loose banded, coupled, or push-on joints.

C. Join PVC pipe and fittings according to ASTM D 3034 with elastomeric seal gaskets according to ASTM D 2321.

D. Join perforated PVC pipe and fittings according to ASTM D 2729, with loose bell-and-spigot joints.

E. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

3.7 CLEANOUT INSTALLATION

A. Comply with requirements for cleanouts specified in Section 33 41 00 "Storm Utility Drainage Piping."

3.8 CONNECTIONS

A. Connect low elevations of subdrainage system to proposed drywell.

3.9 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.
   2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

B. Drain piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.10 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 33 46 00

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Temporary fencing, barricades, and guards to protect trees which are to remain from damage above and below grade.
   1. Erect as shown on plans.

B. Protection of root systems from smothering, compaction and damage.

C. Protection of plant growth, including root systems of trees and plants, from dumping of refuse or chemically injurious material or liquids, and continual puddling of running water.

D. Specification shall be applied concurrently and in conjunction with other plant material protection measures herein described and specified.

1.2 GENERAL REQUIREMENTS

A. Preservation, protection, and pruning of existing trees and shrubs, and other vegetation indicated to remain.

B. Meet local jurisdiction requirements for protection of existing trees and vegetation.

C. Provide temporary fencing, barricades and guards as required to protect trees and other plants to remain from all damage.

D. Protect all trees to remain from stockpiling, material storage, vehicle parking and driving within the Tree Protection Zone.
   1. Do not store construction materials or permit vehicles to drive or park within Tree Protection Zone of any tree to remain.

E. Owner to provide Certified Arborist for review of conditions that arise in the field. Contractor to provide a Certified Arborist to perform the work as needed.

1.3 DEFINITIONS

A. Certified Arborist: Certified by The International Society of Arboriculture (ISA).

B. Drip line: The area defined by the outermost perimeter of a tree's or shrub's vegetated canopy.

C. Tree Protection Zone (TPZ): Area defined by, at a minimum, the *drip line* of a single designated tree or the outermost perimeter of the combined *drip line areas* of a designated group of trees, but more specifically reflecting the *Critical Root Zone (CRZ)* of each tree and

plant species to be protected. This area may be established or extended as deemed necessary by the Owner's Representative.

1.4 SITE VERIFICATION OF CONDITIONS

A. Meet with Owner's Representative to conduct on-site inspection of tree and plant materials to remain and Tree Protection Plan prior to start of Work.

B. Notify Owner's Representative 48-hours prior to starting construction work around trees to be saved and prior to tree work.

PART 2 PRODUCTS

2.1 MATERIALS

A. As indicated and required elsewhere in this Specification Section, and as recommended by Owner's Representative.

B. Fencing: Owner's Representative field reviews and approves all tree protection locations, methods and measures. See Drawings for fencing material.

C. Pruning Equipment:
   1. Roots and Branches Larger than 1-inch in diameter: Sharp saw.
   2. Roots and Branches 1-inch or less in diameter: Pruning shears.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect trees shown on plans to be protected, prior to start of construction.
   1. Document and photograph unusual conditions.
   2. Submit digital copies of documentation to Owner's Representative prior to beginning work.
   3. Verify conditions regarding tree protection prior to site disturbance.

B. Owner's Representative must be present during demolition of existing conditions within drip line of trees to remain.

C. Notify Owner's Representative within 24-hours prior to inspection and/or tagging of protected trees.

3.2 GENERAL

A. Install fencing/barricades around all tree protection zones of trees designated to remain prior to commencement of any construction activities including but not limited to clearing and demolition work.
   1. Once erected, plant protection fencing will be maintained throughout the duration of the work.

2. All ingress is prohibited without prior approval from the Owner's Representative.
3. Designate protected trees to be clear of any material storage, personnel, or vehicular movement.

B. Protect all plant growth including root systems of trees and plants to remain from:
1. Construction activities including but not limited to: material storage, staging, all work activities and parking.
2. Dumping of construction related refuse.
3. Damage due to noxious materials in solution caused by runoff and/or spillage during mixing and placement of construction materials, and drainage from stored materials.
4. Chemically injurious materials and liquids used in construction process.
5. Flooding, erosion, or excessive wetting resulting from dewatering operations, compaction, water flow or traffic.
6. Unauthorized cutting, breaking, or skinning roots and branches, skinning, and bruising of bark.

C. Where cutting seems necessary, review conditions with Owner's Representative before proceeding, and comply with directives.

D. Fires on project site are not allowed.

E. Engage the Owner's Representative to direct removal of branches from trees and large shrubs to remain, if required to clear new construction and where indicated; and to direct tree root pruning and relocation work.

F. Where directed by the Owner's Representative, extend pruning operations to restore natural shape of trees and other plants impacted by construction activities.

G. Cut branches and roots with sharp pruning instruments, as specified. Do not break, chip or mutilate.

H. Water trees and other vegetation to remain as necessary to maintain their health during the course of the work.
1. Maintain a watering schedule and log of watering operations.

I. Restrict vehicular and foot traffic of all construction crews, to prevent compaction of soil over root systems and within tree protection zones.

3.3 PRE-CONSTRUCTION CARE

A. All trees designated to be retained within the project limits shall be pruned to ANSI A-300 Pruning Standards with selective low limb removal, as directed and approved by the Owner's Representative, where required for construction clearance.

B. Structural support (cabling) in accordance with National Arborist Association Standards will be required on specific trees within the project limits and where required for construction clearance, as identified by the Owner's Representative.

3.4 EXCAVATION AROUND TREES

A. Excavate within the tree protection zone of trees only where indicated and approved by the Owner's Representative.
   1. Excavate around tree roots within tree protection zone only under the direction of the Owner's Representative.

B. Where excavating for new construction is required within root protection zones of trees:
   1. Hand excavate to minimize damage to root systems;
      a. Use narrow tine spading forks and comb soil to expose roots.
      b. Reposition roots in backfill areas whenever possible.
   2. Specialized equipment/machinery may be used only as approved by the Owner's Representative and permitting agency. Machinery shall be:
      a. Equipped with rubber tracks, not metal tracks;
      b. Designed to perform the task it is being used for;
      c. Appropriate and capable for each task in order to minimize damage to root systems and avoid disturbance to adjacent surface and subsurface conditions;
      d. Appropriate in size for the specific conditions of the project in order to minimize site impacts to the greatest extent possible;
      e. Operated only by trained and experienced personnel; and,
      f. Operated only within approved, designated locations and, in strict adherence, shall not be allowed to enter, cross, maneuver, park, or otherwise access any areas other than those approved and designated for the work.

C. Where trenching for utilities (including but not limited to sewer, storm, electrical, water service and irrigation) is required within tree protection zones:
   1. Owner's Representative needs to approve trenching routes.
   2. Tunnel under or around roots by hand digging or boring.
   3. Trench toward trunk of tree and tunnel under central root mass to avoid severing lateral roots on sides of trench.
   4. Do not cut main lateral roots or tap roots over 1-inch diameter. If roots larger than 1-inch diameter are damaged or need to be cut, a root inspection by Owner's Representative is required. Cut smaller roots using sharp pruning tools as specified.
   5. Roots greater than 1-inch in diameter exposed during excavation must be cut squarely at the edge of the excavation with a sharp saw or appropriate pruning tool as specified.
   6. Temporarily support and protect roots from damage until permanently covered with approved backfill.

D. Utility trenching routes may need field adjustment or areas of manual excavation to avoid tree roots for both inside and outside of tree protection zones.

E. Do not allow exposed roots to dry out before permanent backfill is placed. Provide temporary earth or burlap cover; pack with wet compost or four layers of wet untreated burlap.
   1. Backfill roots after inspection approval by Owner's Representative.

2. Backfill around root excavations only with clean import topsoil free from materials deleterious to root growth.
3. Backfill to eliminate voids, compact only by means of manual tamping at root areas.
4. Water sufficiently to settle backfill and to eliminate voids and air pockets around roots.
5. Water roots daily when exposed and maintain in a moist condition.
6. Allow for natural settlement of soil surface, and furnish and apply topsoil sufficient to bring to original finish grade after backfill settlement.

F. Notify Owner's Representative immediately upon discovery of conditions that threaten survivability of protected tree or that affect vitality, stability or integrity of root system.

G. All pruning shall be performed to ANSI A-300 Pruning standards and accepted by the Owner's Representative. Other therapeutic care work shall be performed to National Arborist Association standards.

3.5 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within tree protection zones unless otherwise indicated on Drawings or approved by the Owner's Representative.

B. Lowering Grades: Where existing grade is above new finished grade shown around trees, under direction of the Owner's Representative, carefully hand excavate within root zones to new grade. Cut roots exposed by excavation, as specified, to approximately 3-inches below elevation of new finished grade.

C. Raising Grades: Permitted only as acceptable to the Owner's Representative.

3.6 REPAIR AND REMOVAL OF TREES AND PLANTS

A. Engage the Owner's Representative to perform tree and plant repair work.
1. Repair trees and plants damaged by construction operations in a manner acceptable to the Owner's Representative.
2. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees and plants.

B. Remove and replace dead and damaged trees and plants determined by the Owner's Representative to be incapable of restoration to normal growth pattern.
1. Provide new shrubs of same size and species as those replaced or as other wise acceptable to the Owner.
2. Plant and maintain according to specifications provided.

C. Trees designated by Owner for complete removal for construction.
1. Prevent damage to trees to be saved and minimize conflicts between trees and people or property. Activities under trees should strive to minimize impact to trees or root zones. Contractors are responsible for tree damage incurred during construction.
2. Qualifications: The General Contractor must be on site during tree removal. All persons and sub-contractor(s) performing tree work must be licensed Certified Arborists through the International Society of Arboriculture; and must be familiar

with natural area preservation principles. All climbers and sawyers will be licensed Certified Arborists with a minimum of five years of experience doing similar type and scale of work. The Arborists shall be able to fall, block or otherwise remove a tree as required without damage to structures or other trees.

a. The General Contractor shall provide qualifications and references to the Owner's Representative for approval prior to start of work.

3. Work: Trees shall be felled or blocked in the best manner feasible to avoid damage to adjacent trees, plants, root zones, natural resources, utilities and properties. Trees may only be felled or blocked within the designated construction area and, in strict adherence, shall not be placed or allowed to fall outside of the designated construction area or within a tree protection zone. The arborist performing the work shall determine the best method possible for removing each tree and shall develop a strategic plan for tree removal for approval by the Owner's Representative prior to beginning any tree removal work.
4. Stumps: Stumps and roots inside the area of cut and fill are to be removed after initial felling unless otherwise directed. Void from removed stump shall be backfilled with specification material. Stumps outside the area of cut and fill may be cut clean and flush to the ground and left in place with the approval of the Owner's Representative.
5. Diseased Trees: Trees infected with a disease or insect such as Sudden Oak Death or Asian Longhorned Beetle may need to be disposed by following the guidelines of the Oregon Department of Agriculture (ODA). The ODA, the Natural Resources Supervisor and Owner's Representative will need to be notified of suspected trees.
6. Snag Trees: Trees identified on the Tree Plan to be snagged shall be retained in place and cut to the height as approved. Removed woody materials will be utilized as downed wood as approved or removed from the site. Care should be taken to avoid damage to adjacent trees and plants when cutting snags.
7. Safety: The tree removal operation shall be discussed in the Safety Plan. The trees shall be removed without hazard to people and structures. The Safety Plan shall address trees to be felled in a specific direction and be completed by the arborist or trained personnel under the direct supervision of the arborist. The arborist shall review the site ahead of submitting the Safety Plan; and determine if there are additional hazard trees that should be removed as a matter of safety. These trees shall be discussed as a possible change order.
8. When performing tree removal work, at a minimum:
    a. Remove people not involved in the work from the area.
    b. Identify the hazard area with red danger tape.
    c. Prohibit unauthorized individuals from entering into the work area.
    d. Evaluate removal options.

9. All heavy machinery shall be limited to areas outside the drip line of trees to be saved, except as approved by Owner's Representative. Any approved work within the drip line of trees to be saved, shall be done with machinery having rubber tracks, not metal tracks. To minimize compaction, a 12-inch thick layer of wood chips may be placed within the drip line of trees to be saved. Plywood sheets may also be placed over the layer of wood chips to further lessen compaction. The plywood sheets and layer of wood chips shall be removed once the tree removal operation is complete.

10. The Contractor shall fall the trees in a manner to provide usable wood for other projects. Verify specific project requirements with Owner's Representative.
11. Fallen trees blocking a trail need to be cut four feet back from either side of a trail. Tree stumps or visible cuts are to be disguised by muddying up the stump with some surrounding soil and adding pieces of moss if available. If possible, flush cuts on stumps near trails are preferred.
12. Roots are to be cut with sharp tools designed for the purpose. It is advisable not to cut any root larger than 1" in diameter. When unavoidable, roots shall be cut, not chopped or scraped. Where needed, tunnel under or around roots by hand digging or boring. Pruning of limbs and branches shall be done to ANSI A300 arboriculture standards.

D. In the event that any trees or plants are damaged, destroyed, or removed as a result of Contractor's, or it's agents' or employees', acts or omissions, damages shall be assessed against the Contractor in accordance with the formulas and standards set forth in the "Council of Tree and Landscape Appraisers" Guide For Plant Appraisal, as it may be revised. In the event that a tree or plant is damaged, but not to the extent that it must be removed, then damages will be calculated as a percentage of the total value of the damaged tree or plant, as estimated by a Plant Professional authorized by the Owner. Contractor will also pay as damages, the costs associated with the District's appraisal of tree and plant damage and lost value, as well as all costs associated with any repairs to the trees and plants that are needed, as determined solely by the Owner's Representative.

3.7 HARDSCAPE INSTALLATION WITHIN TREE PROTECTION ZONES

A. Only as indicated on Drawings and as approved and/or directed by Owner's Representative.

B. Electrical conduit and irrigation main lines should be run under walkways, within stone or concrete sub-base, and should not cut into native soil within the Tree Protection Zone. Drip irrigation may be installed within the Tree Protection Zone as directed and approved. Lateral electrical lines to individual lights should be installed as close to the soil surface as possible with short runs from the main conduit.

C. Electrical fixtures, housing and irrigation valves must be installed with care to avoid cutting roots. Digging must be minimal with excess dirt removed from the tree protection zone.

D. Utility locations and installation shall conform to all applicable codes and requirements.

E. Roots exposed during excavation shall be treated as specified herein.

F. Install walkways as close to grade as possible to minimize excavation into the soil where large roots and areas of high root density exist. Backfill with loose dirt to the minimum depth necessary to achieve a natural look. Mulch if appropriate, as directed by the Owner's Representative.

3.8 PROTECTION

A. Maintain protective measures throughout construction process.
1. Repair any alteration to protection measures throughout construction process.

2. Repair or reinstall protective measures upon alteration.
3. Monitor protective measures daily.
4. Pruning and/or repairs must be approved in advance and at completion.
5. Contractor is responsible for cost of repair caused by his actions or by actions of his/her subcontractors.

3.9 CLEANING

A. Remove fencing, barricades, and guards. See Section 01 70 00 – Execution and Closeout Requirements.

B. Remove debris and dispose of in a legal manner. See Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION 01 56 39

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Performance bond.

E. Compensation to Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 REFERENCE STANDARDS

A. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2007.

B. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Re-approved 2004).

C. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2004.

D. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.

E. ASTM D 4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.

F. ASTM D 4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2002.

G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.

1.3 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.

B. Also comply with all more stringent requirements of State of Oregon Erosion and Sedimentation Control Manual and Clackamas County Erosion Prevention and Sedimentation Control Manual.

C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit weekly inspection reports.

D. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

E. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

F. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

G. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

H. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

I. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures pump dry and remove deposited sediment after each storm.

J. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.

1. If sedimentation occurs, install or correct preventive measures immediately at no cost to ***Owner***; remove deposited sediments; comply with requirements of authorities having jurisdiction.

K. Open Water: Prevent standing water that could become stagnant.

L. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.4 SUBMITTALS

A. Erosion and Sedimentation Control Plan has been approved by the City of Milwaukie.

B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.1 MATERIALS

A. See Drawings for materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Soil Stockpiles: Protect using one of the following measures:
1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves; or, 6 inches of straw or hay;

C. Temporary Seeding: Use where temporary vegetated cover is required.

3.4 INSTALLATION

A. As shown on Drawings.

3.5 MAINTENANCE

A. Inspect preventive measures routinely (daily), within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
   1. Promptly replace fabric that deteriorates unless need for fence has passed.
   2. Remove silt deposits that exceed one-third of the height of the fence.
   3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
   1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
   2. Remove silt deposits that exceed one-half of the height of the bales.
   3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.6 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Owners Representative.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION 01 57 13

SECTION 32 15 40

CRUSHED STONE PAVING STONE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Work included in this Section: Furnish labor, material and equipment required to install crushed stone paving as shown on Drawings and specified herein

1.2 SUBMITTALS

A. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
   1. Base Course: one-half cubic foot.
   2. Surface Course: one-half cubic foot.

1.3 ENVIRONMENTAL CONDITIONS

A. Do not install crushed stone paving during rainy conditions.

PART 2 - PRODUCTS

2.1 CRUSHED STONE

A. Surface Course: ¼ - inch minus crushed rock, conforming to the following gradation requirements:

Sieve Size	Percent Passing
¼-inch	98-100
#4	95-100
#30	30-50
#200	5-15

1. ½-inch minus material will not be approved.

B. Approved Products and Manufacturers:
   1. Surface Course Base Bid: ¼ - inch minus crushed rock
   2. Base Course: Natural crushed rock conforming to State of Oregon Highway Department Standard Specification Base Aggregate for ¾”-0 crushed rock.
   3. Filter Fabric: nonwoven permeable, per the requirements of Section 31 20 00 Earth Moving.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine the subgrade under which the crushed gravel is to be installed. Notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

B. Lines and Levels: Finished grades are shown on Drawings are to be the top of surface course. Slope uniformly between given spot elevations unless otherwise indicated.
   1. Surfaces shall be true to within ¼-inch when tested in any direction with a 10-foot straightedge.
   2. There shall be no pools of water standing on the surface after a rain.
   3. Transition between changes in vertical gradient of walks and paving shall be smooth and gradual with no abrupt or sharp changes greater than ¼-inch.
   4. Horizontal layout shall not vary more than 1-inch from dimensions indicated on the Drawings.

3.2 INSTALLATION

A. Placement and Compaction: Install filter fabric and uniformly spread acceptable material courses and compact to grades and lines shown. Compaction shall be made by power rollers to 95% at optimum moisture content. Each lift shall be compacted separately immediately after placement.

B. Finish of Surface Course: Finish surface of crushed gravel walkways shall be uniform in appearance as to texture and color, and shall have a firm stable consistency and shall be resistant to erosion.

C. Repairs and Protection: remove and replace crushed gravel paving that is damaged, defective or does not meet the requirements of this section.

D. Clean-up: remove all surplus material, debris and rubbish resulting from work from the site.

END OF SECTION

SECTION 32 31 00

FENCING AND GATES

PART 1 GENERAL

1.1 SUMMARY

A. Furnish all labor, material, equipment and services required for the installation of fencing, posts and fence hardware as indicated on the drawings and/or specified herein. Work shall include any incidentals required to complete installation.

1. Include all rails, braces, fittings, and concrete footings necessary for the complete installation.

B. General: Like items of materials provided hereafter shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance and replacement.

C. Delivery, Storage and Handling: Deliver material to the site new and in an undamaged condition. Carefully store material off the ground to provide proper protection against oxidation caused by ground moisture. In the event of damage, immediately make repairs or replace as necessary to the approval of the Owner and at no additional cost to the Owner.

1.2 REFERENCES

A. Standard Specifications: All work shall conform to all applicable requirements of the following Standard Specifications, whether specifically referred to or not, except as specifically modified herein.

1. Comply with the requirements of the American Society for Testing and Materials (ASTM) especially the ASTM Committee F-14 Standards on Fences (latest edition).

1.3 SUBMITTALS

A. Submit shop drawings for approval, prior to manufacturing, describing and detailing typical details of fence construction, fence height, post spacing, including sizes of posts, rails, accessories, finishes, and concrete footing details.

B. Product Data: Provide manufacturer’s catalog cuts with printed specifications. Manufacturer shall provide certification of compliance with material specifications, manufacturing date and lot number for all materials used on site. Actual samples of the material shall be requested.

C. Acceptable Installers: All installation work shall be performed by a fence and gate installation company with at least five years' experience in projects of similar scale and scope. Contractor shall provide three representative fence and gate projects for Owner's review.

1.4 WARRANTY

A. Provide/submit to Owner's Representative the manufacturer's warranty for each product/item supplied by Contractor. Contractor shall warrant each product/item for one year minimum.

1.5 PROJECT CONDITIONS

A. Existing Conditions: Examine the site to determine existing conditions, extent of work and clearing operations required. Locate all underground utilities and modify work, as approved by Owner's Representative, if necessary to avoid conflicts.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Wood Fencing:

1. Solid Stock: Kiln-dried, S4S; softwood complying with American Softwood Lumber PS 20, and referenced grading rules. Nominal sizes are indicated, except as shown by detailed dimensions. Provide actual sizes as required by PS 20, unless otherwise indicated.
    a. Moisture content: Limited to values required by referenced grading rules, and woodworking standard.
2. Woodworking Standard: Architectural Woodwork Institute (AWI) Quality Standards: Custom.
3. Exterior Finish Carpentry, Typical:
    a. Wood Posts: Western Red Cedar, No. 1 and better, free of heart center, Forest Stewardship Council (FSC) certified.
        1) Nominal sizes: as indicated.
    b. Wood Fence Slats: Western Red Cedar, clear, free of heart center, Forest Stewardship Council (FSC) certified.
        1) Nominal sizes: as indicated.
4. Miscellaneous materials:
    a. Fasteners and anchorages: staples of type, size, material and finish required for application indicated; ASTM A 153 galvanized where exposed to exterior conditions.
        1) 2" Hot dipped galvanized #304 stainless steel nails at 1" thick fence boards.
        2) 2½" Hot Dipped Galvanized #304 screws at fence top rail.
    b. Provide special fasteners, moldings, adhesives and accessories as necessary for each installation.

c. Sealant: Ready Seal Stain and Sealant (888) 782-4648. Apply as directed by manufacturer:

1) Color: Natural Cedar

5. Source Quality Control, Lumber: Factory-mark identify grade, mill and grading agency; submit mill certificate in lieu of marking surfaces for materials which will be exposed to view. Do not stamp or mark surfaces which will be exposed to view in completed Work.

B. Pole and Post Fence

1. Solid Stock: Kiln-dried ; softwood complying with American Softwood Lumber PS 20, and referenced grading rules. Nominal sizes are indicated, except as shown by detailed dimensions. Provide actual sizes as required by PS 20, unless otherwise indicated.

a. Moisture content: Limited to values required by referenced grading rules, and woodworking standard.

2. Woodworking Standard: Architectural Woodwork Institute (AWI) Quality Standards: Custom.
3. Exterior Finish Carpentry, Typical:

a. Wood Posts: Lodgepole Pine, No. 1 and better, free of heart center, Forest Stewardship Council (FSC) certified.

1) Nominal sizes: as indicated.

b. Wood Poles: Lodgepole Pine, No. 2 and better, free of heart center, Forest Stewardship Council (FSC) certified.

1) Nominal sizes: as indicated.

4. Sealant: Ready Seal Stain and Sealant (888) 782-4648. Apply as directed by manufacturer:

1) Color: Natural Cedar

C. Other materials:

1. 3/4-inch-minus aggregate and poured-in-place concrete.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to beginning construction, Contractor shall hold pre-installation meeting on site with Owner's Representative. Contractor shall examine conditions where Fencing is to be erected or repaired. Notify Owner's Representative of any conditions detrimental to the proper and timely completion of the work. Do not proceed with installation until unnecessary conditions have been corrected and are acceptable to the installer.

3.2 INSTALLATION, WOOD FENCING

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are defective manufacture with respect to surfaces, sizes or patterns.

B. Install the work plumb, true, level and straight.

C. Apply sealant, including UV topcoat, according to manufacturer's recommendations.

D. Adjust joinery for uniform appearance. Repair damaged and defective Work. Replace Work which cannot be satisfactorily repaired.

E. Prevent damage and deterioration of installed Work.

3.3 FOOTINGS

A. Unless specified otherwise by manufacturer, comply with the following:
   1. Excavate for concrete footing to neat, clean lines in undisturbed soil. Provide forms in unstable soil conditions.
   2. Top of footing in unpaved areas: 1-inch above finish grade. Slope toward edge of footing to prevent water pooling.

3.4 CLEAN-UP

A. Job site shall be cleared of all excess materials (concrete, wire, rails, pipe, etc.). All areas impacted by construction shall be leveled with import topsoil soil and graded flush with finish grade, be free of all debris and rocks, and restored to as good as or better than the original condition, as approved by Owner's Representative.

B. Leave in a neat and tidy condition daily.

END OF SECTION

SECTION 32 84 00

IRRIGATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. The Contractor shall furnish all labor, supervision, and materials to install a complete irrigation system as described by and implied in the Contract Documents.
   2. The Contractor shall repair any settling of backfilled trenches that may occur during the guarantee period, and completely restore and repair all plantings, lawn, paving, and other site improvements disturbed by this construction.

B. Coordinate work with installation of other site work.

1.2 SUBMITTALS

A. The Contractor shall make all submittals in accordance with Section 01330 – Submittal Procedures.

B. Product Submittals:
   1. Products used shall not deviate from those indicated on Contract Drawings, specified herein or approved through the substitution request process. Product submittals are required for all irrigation items.

C. Quality Assurance Submittals:
   1. Submit copies of manufacturer's installation instructions for irrigation equipment.
   2. Submit documentation that the installer is a licensed and bonded landscape or irrigation contracting firm that specializes in and has experience in the successful installation of similar systems that include installation of centralized irrigation systems.

D. Contract Closeout Submittals:
   1. The Contractor shall submit PDF format Record Drawings and shall include all approved variations or changes, indicating all sleeve, main line, lateral line, valve, wire runs, irrigation head, and other irrigation component locations to be located by field dimensions to the nearest permanent landmark, as approved by the Owner’s Representative.
   2. The Contractor shall submit a letter of certification from the controller system manufacturer’s representative stating that the controller system has been installed correctly.

1.3 SITE CONDITIONS

A. Weather Requirements:
   1. Do not solvent weld polyvinyl chloride pipe (PVC) when ambient temperature is below 40° F and falling.

2. Do not solvent weld polyvinyl chloride pipe in wet conditions, without adequate cover.

B. Schedule for Installing Pipe Sleeves, Conduits and Sprinkler Heads:
1. Coordinate with other trades as required to schedule installation of pipe sleeves and conduits below paving and walks prior to installation of paving and walks.
2. Schedule installation of sprinkler heads after final grading.

1.4 DAMAGES

A. Any structures or facilities damaged by work on this project shall be restored to equal or better than original condition at the Contractor's expense and to the satisfaction of the Owner's Representative.
B. The Contractor shall be responsible for all damage caused by leaks or breaks in the equipment and materials furnished or installed in this contract for 1 year after the date of final acceptance.

1.5 EXISTING UTILITIES

A. The Contractor shall verify, locate, and identify, with visible marking, all existing underground utilities in the areas of work and maintain such markings until all work in those areas is complete. If utilities are to remain in place, the Contractor shall provide adequate means of protection during excavation operations.
B. Should uncharted piping or other utilities be encountered during the execution of the work, the Contractor shall notify the Owner's Representative immediately and consult with the utility owner for instructions before proceeding with the work.
C. The Contractor shall cooperate with the Owner and public or private utility companies in keeping their respective services and facilities in operation. If it becomes necessary to temporarily interrupt existing services or facilities, the Contractor must provide temporary utility services to the satisfaction of the Owner's Representative.

1.6 PERMITS AND REGULATIONS

A. The Contractor shall obtain all necessary permits and inspections as applicable and required for the project. All work detailed and specified herein shall be accomplished in strict accordance with the applicable local, state, and federal codes and regulations.

1.7 RECORD DRAWINGS

A. The Contractor shall maintain a current record of all pipe, wire, and equipment placement, and shall record all variations or changes approved by the Owner's Representative. Changes in layout of proposed work shall be recorded on the Record Drawing Set in blue pencil or ink. Additions to the proposed scope of work shall be recorded on the Record Drawing Set in green pencil or ink. Deletions either in the proposed scope of work or by a change in layout shall be recorded on the Record Drawing Set in red pencil or ink.
B. Record Drawings must be submitted to the Owner's Representative for review and approval on a weekly basis.

1.8 SUBSTITUTIONS

A. Submit Substitution Requests prior to bid date in accordance with Division 1 Section “Product Requirements”.
B. If materials other than those specified in the Contract Documents are proposed, the Owner’s Representative shall determine whether such materials or methods are a suitable or equal substitute. The irrigation system described in the Contract Documents is based on specific GPM output, static and operating pressures. Approved substitutions may require partial or complete redesign of the system at the Contractor's expense. The Owner’s Representative’s decision will be final.

1.9 WARRANTIES

A. Manufacturer's Warranty: Provide equipment manufacturer's standard warranty for control valves, and heads.
B. Installer's Guarantee:
   1. Provide installer's 1-year guarantee for entire system to the Owner’s Representative at the time of final acceptance, showing the date of completion, which shall be the beginning of the guarantee period.
   2. Guarantee shall include repair of trench backfill that settles more than ½” or of plantings, paving, and walk materials damaged by settlement of trench backfill soils during the guarantee period.

PART 2 PRODUCTS

2.1 PIPE

A. All main line PVC (Polyvinyl Chloride Plastic) pipe shall be PVC 1220, Type 1, normal impact, I.P.S., N.S.F. approved and shall conform to ASTM D1784-69, ASTM D1785, and PS22-70. All main line pipe size 3” and smaller shall be Schedule 40 PVC. All main line pipe size 4” and larger shall be Class 315 PVC.
B. All PVC lateral line pipe shall be Schedule 40 PVC pipe and shall conform to ASTM D1784-69, ASTM D1785, and PS22-70. All PVC pipe shall be new, defect free, and continuously and permanently marked with the manufacturer’s name or trademark, size, schedule and type of pipe. Minimum pipe size shall be 3/4-inch.

2.2 PIPE FITTINGS and unions

A. All PVC fittings shall be PVC 1220, Schedule 40, type 1, normal impact, I.P.S., N.S.F. approved and meeting the requirements of ASTM D-2466.
B. All PVC nipples shall be standard weight Schedule 80, with molded threads.
C. All PVC fittings for electrical conduits shall be sweep fittings.
E. Unions shall be Spears 897 series grey Schedule 80 PVC, line size.

2.3 PVC CLEANER AND PRIMER

A. "Weld-On P-75". All equals for "Weld-On P-75" shall meet the requirements of ASTM F-656.

2.4 PVC SOLVENT CEMENT

A. In all circumstances use "Weld-On 725". All equals for "Weld-On 725" shall meet N.S.F. approval for Type I and II PVC through 3” and meeting requirements of ASTM D-2564.

2.5 PVC SLEEVES AND CONDUITS

A. All sleeves for irrigation main and lateral lines shall be Schedule 40 PVC and shall be sized as detailed.
B. All electrical conduit for control wires shall be Schedule 40 PVC, gray in color.

2.6 BACKFLOW DEVICE

A. See Civil Drawings.

2.7 IRRIGATION HEADS

A. As shown on Drawings.

2.8 VALVES

A. Automatic Control Valves: For spray zones: Rain Bird PEB automatic remote control valves where indicated. Size as shown on drawings. See plumbing for installation details. For drip zones: See Drip Irrigation, below.
B. Master Valve: Rain Bird PEB Valve, 1 ½” size, normally-closed type.
C. Quick-Coupling Valves: Rain Bird Model 44-RC quick-coupling valves. Provide 2 keys and swivels.

2.9 VALVE BOXES AND VALVE BOX COVERS

A. Valve Boxes Control Valves: Highline 12-inch standard, Model 071497, with 6-inch extensions as needed to facilitate required installation.
B. Valve Boxes for Quick Coupling and Isolation Valves: Highline 10” diameter, with 6-inch extensions as needed to facilitate required installation.

2.10 SWING JOINT ASSEMBLIES

A. Polyethylene Pipe Swing Joint Assemblies: Where “poly-pipe” swing joint assemblies are detailed on plans and in details the “poly-pipe” shall be flexible black tubing constructed of virgin linear low density polyethylene material. The tubing shall have a wall thickness of 0.090-inch (+/- 0.010-inch). It shall have an inside diameter of 0.490-inch (+/- 0.010-inch) for use with ‘spiral barb’ fittings without the necessity of glue or clamps. The model number and logo of the manufacturer shall be printed at no less than 12-inch intervals along the length of the pipe. Each section of pipe used shall be capable of pressure testing at the rate of 100 lbs./sq.in. to a minimum burst pressure of 475 lbs./sq.in.. All pipe must have an operating pressure rating of 80 lbs./sq.in. at 110 degrees F.
B. Spiral Barb Fittings for Polyethylene Swing Joint Assemblies: All fittings shall be constructed specifically for use in constructing “poly-pipe” swing assemblies. The fittings shall have a maximum operating water pressure of 80 lbs./sq.in.. All fittings shall be

constructed of UV resistant, thermoplastic material and be so designed to permit twist-in insertion eliminating the need for glue or clamps.

C. Triple swing joints:
   1. For quick coupling valves, all threaded nipples to be Sch. 80 PVC and all threaded fittings shall be 40 PVC.

2.11 CONTROLLER AND CONTROLLER ACCESSORIES

A. Controller: Hunter I-CORE –IC-600-PL: 16 Station outdoor controller with plastic wall-mount case to be provided by irrigation installer, see irrigation drawings and specifications. Provide additional compatible station zone expansion modules as required to run the complete irrigation system as well as 4 additional zones for future expansion.
B. Controller Cabinet: Strong Box SB-24SS/120V Metered Enclosure, double door design.
C. Rain Sensor: Hunter Rain-Clik WR-Clik-TR and WR-Clik-R receiver unit. Coordinate location in field with Owner's Representative. Coordinate wiring with electrical contractor.

2.12 WIRE, CABLE AND ELECTRICAL CONNECTORS

A. Control Valve and Tracer Wires: 14 gauge copper wire designed for 24 volts or greater, Type UF, Underwriter's Lab (UL) approved for direct burial in NEC Class II circuits.
   1. Remote control valve pilot wires shall be red in color.
   2. Remote control ground wires shall be white in color.
   3. Extra remote control valve wires shall be blue in color.
   4. Tracer wires shall be yellow in color.

B. Electrical Connectors for all irrigation wires: 3-M DBY/DBR, Rain Bird Snap-Tite or Pen-Tite PVC Socket and Sealing Plus.

2.14 OTHER MATERIALS

A. Pipe Joint Tape: Pipe joint tape shall be a minimum of ½-inch wide Teflon tape intended for use in wrapping threaded PVC pipe fittings and joints, as required.
B. Drain Rock: ¾-inch to ¼-inch washed round rock, with no fines.

PART 3 EXECUTION

3.1 GENERAL

A. Do not allow any work to be covered or enclosed until it has been inspected, pressure tested, and approved by the Owner's Representative.
B. Installation of all materials and equipment shall be in strict accordance with the manufacturer's written specifications and recommendations and with local and state codes, whether detailed or not. The Contractor is responsible for calling to the immediate attention of the Owner's Representative any conflicts between the manufacturer's written specifications and recommendations, local and state, and the Contract Documents. The Owner's Representative may require the Contractor to correct to the Owner's Representative's satisfaction any work installed that results from such conflicts at no additional cost to the Owner.

C. The location of pipe, sprinkler heads, valves, and other equipment shall be as detailed and shall be the size and type indicated. No changes shall be made without prior approval by the Owner's Representative. Minor changes necessary to conform to ground conditions may be made by the Contractor without the Owner's Representative's prior consent in order to ensure the smooth progress of the work. However, all such changes are subject to approval by the Owner's Representative and must be recorded on the Record Drawings.

D. Permission to shut off any water lines must be obtained in writing from the Owner's Representative prior to the beginning of any work. Disruptions in service shall be kept to a minimum.

E. The Contractor shall be responsible for maintaining the system and protecting it from all damage, including damage caused by vandalism or adverse weather conditions, until date of final acceptance. The Contractor shall be responsible for repairing such damage at no additional cost to the Owner.

F. The Contractor shall maintain at the site a clean copy of the drawings for recording changes to the project. All changes shall be recorded within 24 hours of occurrence.

3.2 TRENCHING

A. A minimum depth of cover to the top of irrigation piping shall be as follows:
   1. All lateral lines shall have 18-inches minimum and maximum 18-inches depth of cover.
   2. Where multiple pipes are laid in common trench, the Contractor must maintain a minimum separation of 2-inches in any direction between all pipe.
   3. All sleeves and conduits shall have 24-inches minimum and 30-inches maximum depth of cover.

B. Remove all lumber, rubbish, and rocks from irrigation trenches. Irrigation lines shall have a firm, uniform bearing surface for the entire length of each line. Wedging or blocking of pipe is not permitted.

C. Before back-filling trenches, all pipe shall be flushed clear and clean of all dirt and foreign material.

D. Backfill trenches in layers of not more than 6-inches in depth and compact each layer. Fill trenches to finish grade with native or imported topsoil keeping the top 12-inches free of rock. Restore surface to original or better than original condition.

E. Any materials or equipment damaged or destroyed while back filling shall be repaired or replaced by the Contractor at no additional cost to the Owner.

F. Backfilling under all paved areas shall conform to minimum density and compaction requirements as described in applicable specification sections.

3.3 PIPE

A. Exercise care in handling and storing all pipe and fittings. Store materials under cover before using. Transport materials in a vehicle of adequate size and capacity to prevent bending or the concentration of an external load at any point on the materials. Any materials or portions of materials that show such damage shall be discarded and replaced.

B. Remove all foreign matter and dirt from inside pipe or fittings before lowering into the trench.
C. Install all pipe and fittings per the manufacturer's specifications. Use the specified primer and cement on all glue joints. Use Teflon tape on all threaded joints.
D. Snake pipe in trenches to allow for expansion and contraction as recommended by the manufacturer.
E. At all installed joints cut pipe ends square and remove all burrs.
H. Where Pipe is installed under pedestal paving system, route strategically to minimize conflicts. In order to prevent movement, mainlines shall be securely fastened to pedestal system with cable ties at 4' maximum spacing. Where pipe is in direct contact with pedestals or any other elements that may abrade the pipe, the pipe shall first be wrapped with specified PVC pipe foam tape.

3.4 VALVES

A. Install within shrub planting areas whenever possible. Install as detailed and as recommended by the manufacturer, complete with valve box and extension(s) and as detailed. All valve boxes shall be installed so that the top of the box is flush with adjacent finish lawn grade or 1-inch above planting area grade, after settling. Valves shall not be manifolded and shall be located no closer than 3' on center apart. Owner's Representative shall approve final valve locations prior to commencement of trenching operations.
B. See Plumbing drawings for installation of all valves located inside the building.

3.5 CONTROLLER, CONTROLLER ACCESSORIES AND RAIN GAUGE

A. Install as shown on the drawings and as recommended by the manufacturers.
B. Coordinate with other trades as necessary to facilitate complete installation.
C. Contractor shall meet on-site with the controller manufacturer's representative, prior to commencement of installation of controller.

3.6 IRRIGATION HEADS

A. Install irrigation heads of types, sizes and coverage called for in the Irrigation Legend/Key at the locations as detailed. Minor changes in head location may be necessary to achieve the required coverage at no additional expense. Notify the Owner's Representative for approval prior to making any changes. Document all changes on project Record Drawings as they occur.
B. Unless otherwise noted on the drawings, locate no head closer than 3-inches from any adjacent walk (gravel, concrete or otherwise), and no closer than 6-inches from any adjacent structure, deck or building.

3.7 IRRIGATION SLEEVES

A. Install sleeves for irrigation lines and/or control wire under pavement prior to placing pavement materials. Extend sleeves beyond pavement edge a minimum of 12-inches. All sleeves shall be installed with a minimum depth of cover to the top of the pipe of 24-inches. If length of required sleeve is greater than the length of the unit of pipe, solvent weld all joints required. Otherwise all sleeves shall be of one continuous length of pipe.

B. Tape ends of sleeve closed to keep soil out of the sleeve until irrigation lines and/or control wire are installed.
C. Stake both ends of sleeves with a readily visible stake extending 12-inches above grade and below grade to the bottom of the sleeve. Mark the above grade portion of the stake with the words "Irrig. Sleeve". Remove stakes after sleeves are recorded on the Record Drawings and after irrigation lines and/or control wires are installed and inspected.
D. In areas of new paving, place a minimum of 4-inches of sand backfill over the top of all sleeves before back-filling with soil or other subgrade materials.
E. Where sleeves pass under concrete paving or curbs, concrete shall be marked with a marking tack as described in the concrete section.

3.8 IRRIGATION WIRING AND CABLES

A. Tape control wires and cables in trench under main line or lateral lines whenever they occur in the same trench. Place control wires in electrical conduits or sleeves under all paving and when not in common trench with main line or lateral lines.
B. Make all wire and splices moisture proof using specified electrical connectors. Splices shall be made in valve boxes only. All splices shall be noted on Record Drawings. Provide a minimum of 1-foot of coiled slack between all wire splices.
C. Control wires shall be bundled together and wrapped with electrical tape at intervals of no more than 10-feet. Wires shall be placed below mainline or laterals when in same trench.
D. Sharp bends or kinks in wires and cables shall not be permitted. Wires shall be unreeled in place alongside of or in the trench and shall be carefully placed along the bottom of the trench. Wire shall not be unreeled and pulled into trench from one end.
E. Install tracer wires with all lateral line pipes and sleeves, taped to top of pipe or sleeve at 10-foot intervals with electrical tape. Where pipes tee off, make wire connections with specified waterproof connectors.
F. For control wires, cables and tracer wires, provide 18-inches loop of extra wire in all valve boxes.
G. Contractor shall install all remote control valve wires and cables from valves to controller shown at the approximate location on the Drawings. Contractor shall coordinate with other trades as necessary to facilitate this installation.
H. Label all installed wires on each end with waterproof tags for all wires including those for future use.

3.9 IRRIGATION CONTROLLER

A. The Contractor is responsible for providing a power source and making connections to the specified controller locations in accordance with the manufacturer’s standard specifications and all applicable local and state codes.
B. The Contractor shall install controllers as detailed and as recommended by the manufacturers.
C. The Contractor shall determine the sizes and quantities of all conduits coming into the controller that will be required for all specified wiring. The use of smaller gauge wiring than specified in order to route through undersized conduits shall not be allowed.
D. All wiring within the building shall be installed with securely mounted conduits.

3.10 FLUSHING AND TESTING

A. Thoroughly flush all piping before testing and installation of irrigation heads and before back-filling any trenches.

B. The Contractor shall not allow or cause any work to be covered before it has been inspected and approved. Work covered before approval shall be uncovered at the Contractor's expense.

C. Soil may be placed in trenches between fittings to insure the stability of the line under pressure. In all cases, fittings and couplings must be open for visual inspection for full period of test. No testing shall be done until the last solvent welded joint has had a minimum of 24-hours to set and cure.

D. Before testing, fill pipe with water and expel all air from pipes. Thrust blocks and all valves shall be in place prior to filling the main line with water for testing.

E. Minimum pressure test on mainline, valves, joints and fittings, shall be 100-lbs./sq.in. without losing more than 1-pound per square inch during a period of 1-hour. Lateral lines shall be visually inspected by the Owner's Representative at line pressure with swing joints installed and capped. The Contractor shall first perform the tests for himself and repair any leaks or defects. The Contractor shall then notify the Owner's Representative at least 24-hours in advance and complete another test in the presence of the Owner's Representative for approval. All testing shall be done with a certified pressure gauge supplied by the Contractor.

F. The Contractor shall adjust and balance the irrigation system to provide uniform coverage prior to commencement of planting operations. The Contractor shall change or adjust heads and/or nozzles as required to provide uniform coverage and match final grades. Upon completion of all systems and coverage tests performed by and for the Contractor, the Contractor shall notify the Owner's Representative at least 24 hours in advance, and perform another coverage test in the presence of the Owner's Representative for approval.

G. Where inspected work does not comply with specified requirements or if pressure tests fail, replace the rejected work until re-inspected by the Owner's Representative and found to be acceptable. The Contractor shall credit the Owner, against the contract amount, at the rate of $75.00/hr. for re-inspection of failed tests.

3.11 CLEAN-UP

A. Upon completion of the work, clean up all boxes, wrappings, excess materials, and other rubbish resulting for this work and leave the site in original or better condition.

3.12 FINAL SUBMITTAL

A. Submit Record Drawings and project manuals. Provide owner with laminated 11x17 zone chart with each zone numbered and color coded to identify zone and area of coverage. Record Drawing Document to be provided in PDF format to Owner as well.

B. Provide training to Owner as described in Paragraph 1.2 D.

END OF SECTION

SECTION 32 91 19

LANDSCAPE GRADING, TOPSOIL, AND SOIL PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. This section covers all Work necessary to furnish and place amended topsoil and general preparation of planting areas as denoted on plan.

B. Balanced Site:

The intent is to balance cut and fill onsite. Prior to grading operations, contractor to supply cut and fill analysis of proposed grades for review. At that time, slight adjustments of the site earthwork may be necessary. During earthwork operations, Owner's Representative and Contractor to monitor earthwork operation to achieve a balanced site. Adjustments to the contract document grades deemed necessary to balance the site and associated earthwork changes shall be done at no cost to the owner.

C. Related Sections:
1. Section 31 20 00 – EARTHWORK
2. Section 32 84 00 – IRRIGATION
3. Section 32 92 19 – SEEDING
4. Section 32 93 00 – TREES SHRUBS AND GROUNDCOVER

1.2 PROTECTION

A. Protect existing trees to be preserved as denoted on plan, and other features such as fences, roads, sidewalks, paving, and curbs as final work.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter, sand, silt, and clay particles: fertile, friable, pervious natural fine sandy loam, or silt loam, a darker shade of brown or gray than underlying subsoil, with a pH range of 5.5 to 7, 4 percent organic material minimum, free of subsoil, stones or hard earth 1-inch or larger, free of noxious weeds (including quack grass and horsetail), roots, stones, sticks or other extraneous material.

1.4 SUBMITTALS

A. The Contractor shall make all submittals in accordance with Section 01 30 00-ADMINISTRATIVE REQUIREMENTS.

B. Submit manufacturer's or vendor's certified analysis for soil amendments, fertilizer and other materials. Submit other data substantiating that materials comply with specified

requirements. Such certificates may be tags, labels, and manufacturer's literature, and all submittals shall be reviewed for approval by Architect prior to installation.

C. Furnish Ziploc bag of of the following, including supplier's name and location of supply to Owner's Representative for approval before delivering to job site:
   1. Compost mulch.

D. Product data and proof of purchase for all fertilizers and soil amendments, as well as other specified amendments.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver packaged materials in manufacturer's unopened containers fully identified by name, brand, type, weight and analysis.

B. Store and handle packaged materials to prevent damage and intrusion of foreign matter.

   1. Maintain stockpiled topsoil in designated areas. Provide erosion control measures for stockpiled topsoil on site to prevent contamination of the soil.

C. Submit receipts of all fertilizers and compost to Owner's Representative.

1.6 SITE CONDITIONS

A. Topsoil placement and soil preparation shall not take place during periods where saturated soil or surface water is present in work areas.

B. Work shall not take place when temperature is less than 32° F. or soil is frozen.

C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before placing topsoil.

D. Utilities: Determine location of above grade and underground utilities and perform work in a manner that will avoid damage. Hand excavate as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.

1.7 PROTECTION

A. Provide adequate measures to protect workers and passersby at the site. Execute all works in an orderly and careful manner with due consideration for any and all surrounding areas, plantings, or structures which are to remain. Protect all adjacent property and improvements from work damage, and replace any portions damaged through this operation.

PART 2 PRODUCTS

2.1 NATIVE TOPSOIL

A. It is the intent of the project to use existing native stockpiled topsoil for all topsoil placement meeting the requirements of Paragraph 1.3.

2.2 COMPOST

A. Compost shall be a commercially manufactured material, medium grind, made from dead plant material such as grass clippings, weeds, green and dead dry leaves, garden and vegetable material, and ground branches of trees and shrubs. Furnish a product that is composted under controlled aerobic decomposition, with the internal temperature reaching 57ºCelsius (135ºF) for 15 days, without exceeding 68ºCelsius (155ºF). Ensure that it is a mature compost and does not contain detrimental components. Certification by testing will be required.

B. Compost Analysis: Have a Compost Foodweb Analysis test performed on a sample of the compost at a soil food web lab and submit a copy of the test results to the Owner's Representative for approval. The compost must meet the criteria of this section. The test must give results in the following categories:
1. Active Bacterial Biomass
2. Total Bacterial Biomass
3. Active Fungal Biomass
4. Total Fungal Biomass
5. Hyphal Diameter
6. Protozoa Numbers
7. Total Nematode Numbers

C. An approved Soil Food Web Lab is:
Soil Foodweb Inc.
1128 NE 2nd Street, Suite 120
Corvallis OR 97330
541-752-5066 www.soilfoodweb.com

2.3 SOIL AMENDMENTS/ADDITIVES

A. Soil additives for correction of pH and nutrient deficiencies shall be factory labeled containers and approved prior to application.

B. Yard Debris Compost: Compost must be yard debris certified by Metro Earthwise program. Available from Yard Debris and Recycling (503.286.0886) or approved equal. Compost to be well-aged and weed-free.

C. Lime: HumiSmart Lime by Proturf Solutions or approved Equal

D. Pro Gold Plus 22-2-10 by Proturf Solutions

E. Herbicide: TriMec, Round-up, or other herbicides as approved.

F. Water: Potable.

2.4 STORMWATER PLANTER SOIL: Import topsoil to meet City of Portland BES standards:

A. General Composition. The medium shall be any blend of loamy soil, sand, and compost that is 30-40 percent compost (by volume) and meets the other criteria in this specification.

B. Analysis Requirements for the Blended Material.

1. Particle Gradation. A particle gradation analysis of the blended material, including compost, shall be conducted in conformance with ASTM C117/C136 (AASHTO T11/T27). The analysis shall include the following sieve sizes: 1 inch, 3/8 inch, #4, #10, #20, #40, #60, #100, #200. The gradation of the blend shall meet the following gradation criteria.

Sieve Size	**Percent Passing**
1 inch	100
# 4	75 -100
# 10	40-100
# 40	15-50
# 100	5-25
# 200	5-15

The blend shall have a Coefficient of Uniformity (D60/D10) equal to or greater than 6 to ensure that it is well graded (has a broad range of particle sizes). The coefficient is the ratio of two particle diameters on a grain-size distribution curve; it is the particle diameter at 60 percent passing divided by the particle diameter at 10 percent passing.

2. Organic Matter Content. An analysis of soil organic matter content shall be conducted in conformance with ASTM D2974 (loss on ignition test). The soil organic matter content shall be a minimum of 10 percent, as reported by that test.

3. pH. The pH of the blended material shall be tested. The material shall have a pH of 5 to 8.

C. General Requirements for the Blended Material.

1. The material shall be loose and friable.
2. It shall be well mixed and homogenous.
3. It shall be free of wood pieces, plastic, and other foreign matter.
4. It shall have no visible free water.

D. Compost. The compost shall be derived from plant material and provided by a member of the US Composting Council Seal of Testing Assurance (STA) program. See www.compostingcouncil.org for a list of providers in Portland. The compost shall be the result of the biological degradation and transformation of plant-derived materials under conditions designed to promote aerobic decomposition. The material shall be well composted, free of viable weed seeds, and stable with regard to oxygen consumption and carbon dioxide generation. The compost shall have no visible free water and produce no dust when handled. It shall meet the following criteria, as reported by the US Composting Council STA Compost Technical Data Sheet provided by the vendor.

1. 100 percent of the material must pass through a ½-inch screen.
2. The pH of the material shall be between 6 and 8.
3. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0 percent by weight.
4. The organic matter content shall be between 35 and 65 percent.
5. Soluble salt content shall be less than 6.0 mmhos/cm.
6. Germination (an indicator of maturity) shall be greater than 80%.
7. Stability shall be 5-7.
8. Carbon/nitrogen ration shall be less than 25:1.
9. Trace metals test result = "pass."

PART 3 EXECUTION

3.1 EQUIPMENT

A. Contractor shall furnish and maintain earth-moving and compaction equipment in satisfactory condition and shall operate such equipment as necessary to control uniform density, and smoothness.

3.2 INSPECTION

A. Verify site conditions and note irregularities affecting work in this Section.

B. Beginning work of this section means acceptance of existing conditions.

3.3 EXCAVATION HANDLING

A. Remove all foreign matter obtained from site soil cleaning, screening and/or picking process from the site and legally dispose of as required by the appropriate jurisdiction. Dispose of all waste off-site.

3.4 GRASS REMOVAL

A. General Site Areas — All site work areas within the projects:
Contractor to remove top layer of grass, approximately 2-inches and haul off-site. Contractor to use care not to removal additional topsoil below existing grass layer.

3.5 CULTIVATION AT EXISTING TREES

A. Do not cultivate within the dripline of existing trees (Tree Protection Zones).

3.6 SHRUB AND SEEDED GRASS PLANTING AREAS

A. This section pertains to those areas on-site where seeded grasses, ground covers and shrubs are scheduled to be planted.

B. Excavate and remove existing topsoil to a 6-inch depth and stockpile on site.

C. Grade subgrade as necessary to achieve finish elevation prior to adding topsoil. Thoroughly rototill subgrade to a minimum 6-inches depth for approval.

D. Place topsoil backfill a 6-inch lift, watering lightly to allow topsoil to settle between lifts. Add additional topsoil to bring soil level to grades shown on Drawings.

E. Incorporate the following into the top 6 inches of topsoil in all planting areas.
   1. Pro Gold Plus 22-2-10 at a rate 4.6 pound per 1,000 square feet.
   2. HumiSmart Lime at a rate of 50 pounds per 1,000 square feet.

F. The following organics shall be added to the soil per 1,000 square feet and rototilled to a 6-inch depth (average 2-inch layer):
   1. 6 cubic yards yard debris compost.

G. See Section 32 93 00 – Trees, Shrubs and Groundcover for mulch placement in beds.

3.7 SOIL PREPARATION FOR PLANTING PITS OF TREES AND SHRUBS

A. Thoroughly mix 3 parts approved topsoil with 1 part yard debris compost and 2 lbs. of Woodburn fertilizer "Pro Ornamental" per cubic yard 14/18/12 slow release. Place in planting pits as specified in Section 32 93 00-TREES, SHRUBS AND GROUNDCOVER.

B. Grade smooth to elevations shown on Contract Documents.

3.8 FINAL FINISH GRADING

A. All Topsoil and Conditioner placement shall not be performed when satisfactory results cannot be obtained due to rain freezing weather, or other unsatisfactory conditions.

B. Rocks, stones, sticks, brush, roots, and other objectionable materials shall be removed and disposed of off-site.

C. All areas to be planted shall be graded and floated to eliminate water holding depressions and pockets.

D. Undulations and unsightly variations in grade that will not permit the use of normal mowing equipment without scalping or missing shall be re-graded and floated to smooth surfaces.

E. Grading tolerance shall be within ±1-inch from finish grades. All areas shall be graded to provide positive drainage. Owner's Representative shall review grades prior to Contractor proceeding with further construction, irrigation or planting.

F. All planted areas shall be machine or hand worked to eliminate objectionable lumps and soil clods, as deemed necessary by the Owner's Representative. Tillage shall include the removal of all equipment ruts and tracks, areas of compaction or erosion, and any other undesirable soil conditions which would prevent the proper formation of a finely pulverized seedbed, as directed by Owner's Representative.

G. Finish grade after full settlement, not including mulch, shall be 1-inch below tops of curbs, walks, or existing grades in shrub, groundcover and ornamental grass areas, and ½-inch lower in seeded grass areas.

3.10 UTILITY PROTECTION

A. Contractor shall be responsible for protecting all existing and proposed water lines, underground utilities, and any other subsurface features while excavating and working on the project site

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Furnish labor, material and equipment required for the application of seed to establish finish lawn and grass areas as shown on the Drawings. The following specification addresses both methods.

B. Owner's Representative shall determine areas beyond those shown on Contract Drawings disturbed by construction and to be prepared and seeded at no additional cost to the Owner.

1.2 REFERENCES

A. AOSA- Association of Official Seed Analysis:

1. Rules for Testing Seeds, Journal of Seed Technology, 1991 Edition.

B. FSA- Federal Seed Act.

1.3 DEFINITIONS

A. PLS: Pure Live Seed.

1.4 SUBMITTALS

A. Submit certificates of inspection as required by County Agricultural Inspector. Submit manufacturer's or vendor's certified analysis for soil amendments, fertilizer and other materials. Submit other data substantiating that materials comply with specified requirements. Such certificates may be tags, labels, and manufacturer's literature, and all submittals shall be reviewed for approval by Owner's Representative prior to installation.

B. Submittals shall include but not be limited to the following:

1. Fertilizer: Chemical and percentage composition.

2. Mulch: Size, type of material and fertilizer amendments.

3. Amendments: Type, size and composition.

4. Seed: Botanical and common name, percentage by weight, percentages of purity, germination and weed seed for each grass seed species.

5. Tackifier.

6. Planting schedule indicating anticipated dates for seeding.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that grass planting is in progress.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1. Ship and store seed, mulch and fertilizer with protection from weather or other conditions that would damage or impair the effectiveness of the product.

2. Contractor shall save all seed and fertilizer tags and fiber mulch bags for the Owner's Representative to verify compliance with the drawings and specifications.

1.7 COORDINATION AND SCHEDULING

A. Planting Season: Sow lawn seed during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion.

B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

C. Coordinate work with installation of other site work including irrigation and planting.

1.8 INSPECTIONS

A. Site visits for review of work shall be scheduled by the Contractor a minimum of 48 hours in advance with the Owner's Representative.

PART 2 PRODUCTS

2.1 SEED

A. Grass Seed: Certified, Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.

1. See drawings for seed mixes.

B. Substitutions:

1. If specified seed material is not obtainable, submit proof of non-availability to Owner's Representative, together with proposal for use of equivalent material.

2. Substantiate such proof in writing no later than 30 days after Award of Contract.

2.2 MATERIALS

A. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, non-toxic, free of plant growth or germination inhibitors, with maximum moisture content of 15% and a pH range or 4.5 to 6.5.

B. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, non-toxic and free of plant growth or germination inhibitors.

C. Fertilizer: 16-16-16 with 6-percent slow release available from Woodburn Fertilizer, (503.981.3521) at 400 lbs per acre or approved equal.

D: Hydro Slurry Mix: Hydro slurry mix to contain wood cellulose fiber mulch, dyed green at 2,000 lbs. per acre. Tackifier shall be applied at 50 lbs per acre.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of work in this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseed overspraying.
2. Agitate as necessary the slurry to assure an even mix of ingredients.

3.3 HYDROSEEDING

A. Installation procedures:

1. Inspection of conditions: Examine related work including irrigation and grading of surface before proceeding with any work and notify the Owner's Representative in writing on conditions which may prevent the proper execution of this work. Failure to report unsuitable conditions will require the contractor to rectify unacceptable work at no additional cost to the Owner.

2. Water all plant areas thoroughly to saturate upper layers of soil prior to the hydroseeding operation.

3. Allow the planting area soil surface to dry out for one day only prior to the hydroseeding application. Exercise care not to allow the soil surface to be overly saturated with water prior to the hydroseeding installation. At the same time the soil surface should not become too dry during this period. There should be some residual moisture within the first 1/4 inch of the soil surface.

B. Hydroseeding Application – First Step:

1. Apply the hydroseeding in the form of the seed and 10-percent of the hydro-slurry mix. When hydraulically sprayed onto the soil, the mulch shall form a blotter-like material. Direct the spray operation so that this procedure will drill and mix the slurry components into the soil, the slurry spray will also penetrate the soil surface, thus ensuring maximum impregnation and coverage.

2. Do not let the hydroseeding slurry components in the hydroseeding machine for more than two (2) hours.

3. Spray the area with a uniform visible coat, using the dark color of the cellulose fiber as a visual guide. The slurry shall be applied in a downward drilling motion via a fan stream nozzle. Insure that all of the slurry components enter and mix with the soil. Insure the uniformity of the hydroseed application.

C. Hydroseeding Application – Second Step:

1. After area has been seeded and not longer than 48 hours, contactor shall apply the remaining hydroslurry mix with the fertilizer over all turf areas.

2. Exercise special care to prevent any of the slurry from being sprayed onto any hardscape areas including concrete walks, fences, walls, buildings, etc. Remove all slurry sprayed onto these surfaces at the contractor's expense.

D. Hydroseeding Establishment:

1. Upon acceptance of hydroseeding operations, maintain all hydroseeded areas for a period of 60 calendar days as follows:

a. Germination stage irrigation: Approximately 25 hours after hydroseeding the planting areas, initiate the watering sequence. Leave the water on long enough to moisten the soil thoroughly to the depth of the slurry mulch taking care not to super saturate or wash away the slurry and seed. Perform frequent, light irrigation until the seed has germinated. Repair all seed washings and erosion.

b. Establishment stage irrigation: After germination, reduce each watering.

c. All seed areas to receive water through irrigation or handwatering to ensure establishment.

E. Provide hand-watering of areas that do not have irrigation for grass establishment.

3.4 MAINTENANCE

A. Begin maintenance of lawns immediately after full stand of grass has germinated to a minimum 1.5-inches in height and Substantial Completion has been accepted for entire site area. Maintenance shall continue for not for less than the following periods.

1. Seeded Lawns: 60 calendar days after full stand of grass has germinated to a minimum 1.5-inches in height and Substantial Completion. Substantial Completion is when all areas have been seeded and planted. Approvals will not be given for partially completed areas.
   a. When full maintenance period has not elapsed before end of planting season (October 15th), continue maintenance during next planting season (March 15th). Contractor to fulfill remaining part of the 60 calendar day requirement during the following year.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn free of weeds and eroded or bare areas.
   1. Replant bare areas with same materials specified for lawns.
   2. Water lawns at such frequency as weather conditions require, to maintain appropriate soil moisture throughout the rootzone.
   3. Weeding: All concentrated developments of weed growth appearing in the seed mix planting areas during the maintenance period shall be removed at two (2) week intervals. The contractor may elect to remove such concentrations of weeds manually or by a City approved herbicide program.

C. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height.
   1. Mow lawn areas from 2- to 3-inches high.

D. Post Fertilization: Apply fertilizer to lawn after first mowing and when grass is dry. Apply Wilco Farmers 25-5-10-7-2MG-2FE at 300 lbs per acre.

E. If maintenance period is delayed into the following year, Contractor is to apply post fertilization at the end of the 60-day period as required under D.

3.5 FINAL ACCEPTANCE

A. Acceptance of all seeded areas will be based on growth of a uniform color and dense stand of grass, without bare spots of over 100 sq.in. Grass shall have a lush, green appearance without yellow spots.

3.6 CLEAN UP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soils onto surfaces of roads, walks, or other paved areas. Remove germinated seed in planting areas without harming other plant material.

3.7 FINAL PROTECTION

A. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

END OF SECTION

SECTION 32 95 00

PLAYGROUND EQUIPMENT AND SURFACING

PART 1 GENERAL

1.1 SUMMARY

A. Play Equipment will be purchased and installed by Contractor. Furnish all labor, material, equipment, and services required for the installation of playground equipment and surfacing.
   1. Play Area Surfacing:
      a. Engineered wood fiber surfacing as detailed and specified herein.

B. References:
   1. American Society of Testing and Materials (ASTM).
   2. International Play Equipment Manufacturer's Association (IPEMA).
   3. National Playground Safety Institute (NPSI).

1.2 SUBMITTALS

A. Product Data: Submit to Owner's Representative two sets of manufacturer's technical data and installation and maintenance instructions for each item, with list of accessory items. Clearly indicate size, model, finish and color.
   1. For engineered wood fiber surfacing, additionally provide ASTM F 11292 test results, ASTM F 1951 test results and ½ cu. ft. sample.

B. Shop Drawings: Contractor to provide all final shop drawings; and, provide all coordination and execution of building permits and related requirements. Submit shop drawings of those items requiring shop fabrication, needing detail or structural clarification, or those having special considerations to adapt to site conditions.
   1. Detailed erection drawings and bills of materials shall be furnished by manufacturer for each play structure. Drawings shall include footing details and technical data necessary for correct assembly. To facilitate ease of assembly, each manufactured metal component shall be indelibly marked with an easily recognized identification number keyed to the erection drawings.
   2. Submit 3 copies to Owner's Representative.
   3. Maintain one copy at the Project Site for reference purposes.
   4. Do not proceed with the installation of manufactured products until an approved copy of the submittal is in the Installer's possession at the Project Site.

C. Play equipment manufacturer to provide $2 million product liability insurance certificate for any single occurrence, with the DISTRICT named as certificate holder.

D. Product data for Playground Surfacing: Submit manufacturer's product data, including warranty and installation instructions, ASTM F 1292 test results, ASTM F 1952 test results, IPEMA certification of compliance and samples.

1.3 QUALITY ASSURANCE

A Manufacturing Standards: Provide each item of equipment as a complete unit produced by a single manufacturer, including fittings, accessories, bases, and anchorage devices.

B. Construction: Construct each item and ship to the site in minimum number of sections.

C. Manufacturer's Qualifications for Engineered Wood Fiber Playground Surfacing:
1. Member of IPEMA.
2. Certified by NPSI.

D. All playground equipment shall meet or exceed current U.S. Consumer Product Safety regulations and state and local government laws and codes, as well as the standards and requirements of IPEMA and NPSI.

E. Installer's Qualifications for Playground Surfacing and Equipment Installation: Installer shall be a certified installer by manufacturer of specified playground equipment and surfacing system and shall have 5 years successful experience in installing playground surfacing and equipment of similar size and complexity. Contractor shall have CCB Good-standing, and successful track record of Playground Installs with references.

1.4 WARRANTY

A. Provide / submit to Owner's Representative the manufacturer's warranty for each product / item supplied by Contractor. Contractor shall warrant each product / item for one year minimum.

B. Warranty on playground equipment and surfacing shall be 10 years minimum.

1.5 PROJECT CONDITIONS

A. Existing Conditions: Locate all underground utilities and modify work, as approved by Owner's Representative, if necessary to avoid conflicts.

PART 2 PRODUCTS

2.1 MANUFACTURERS / DISTRIBUTORS

A. GameTime (800) 235-2440

B. The Fibar Group (914) 273-8770

2.2 PLAYGROUND EQUIPMENT

A. Contact: Martha Rainey MRC GameTime (503) 708-4878
B. GameTime Xscape Playground Model #MR092217
C. GameTime #26119 Xscape Swing with (2) belt seats Model #8910 and (1) bucket seat, Model #18696
D. Gametime Mini Pod Toad Stools, Model #6141
E. All play equipment shall be Green and Blue Color scheme

2.3 PLAYGROUND SURFACING

A. Surfacing Material: Fibar Engineered Wood Fiber Playground Safety Surfacing by The Fibar Group LLC.
   1. Or approved equal.

B. Geotextile Weed Barrier Fabric: Nonwoven geotextile fabric, 55 mils thick, with a tested 170 gallons per square foot per minute permeability.

C. Drain Rock and Drain Pipe: See civil engineer drawings for layout and connection to dry well.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces or conditions where Site Furnishings are to be erected. Notify the Owner's Representative of any conditions detrimental to the proper and timely completion of the work. Do not proceed with installation until unsatisfactory conditions have been corrected and are acceptable to the installer.

3.2 INSTALLATION

A. Install a 6-foot high panelized chainlink fence around play area prior to play equipment being installed and leave fence up until play equipment has been fully installed. The panels shall be attached to one another and locked at one end.

B. Excavate area to depths required, grade and compact subgrade, sloping surface 1 percent minimum to insure proper subdrainage.

C. Install play area curbs and fluctuation ramp as detailed.

D. Install play equipment and concrete footings per manufacturer's instructions and as indicated on approved Shop Drawings. Stake out locations of playground equipment for approval by Owner's Representative prior to initiating installation.

E. Install drainage pipe and cleanouts per civil and landscape drawings.

F. Install geotech fabric. Cover subgrade with geotextile fabric. Overlap all seams a minimum of 3-inches and secure the fabric rings with pliers every one to two inches. It will be necessary to slit the fabric to fit around equipment uprights. Where possible, overlap all slits with next piece of fabric. Install drainrock and wrap with geotextile fabric as indicated.

G. Place warning labels on uprights as recommended by manufacturer.

H. Install the engineered wood fiber to the proper depth. Spread material manually. Initially the surface material will be several inches above grade until it compacts. Use compactor to achieve uniform accessible surface.

I. Rake surface for uniform appearance. Rake again two weeks following installation.

3.3 FOOTINGS

A. Unless specified otherwise by manufacturer, comply with the following:

1. Excavate for concrete footing to neat, clean lines in undisturbed soil. Provide forms in unstable soil conditions.
2. Footings shall be sized and installed, including reinforcement as recommended by manufacturer.
3. Top of footing in unpaved areas: 1-inch above finish grade. Slope toward edge of footing to prevent water pooling.

3.5 CLEAN-UP

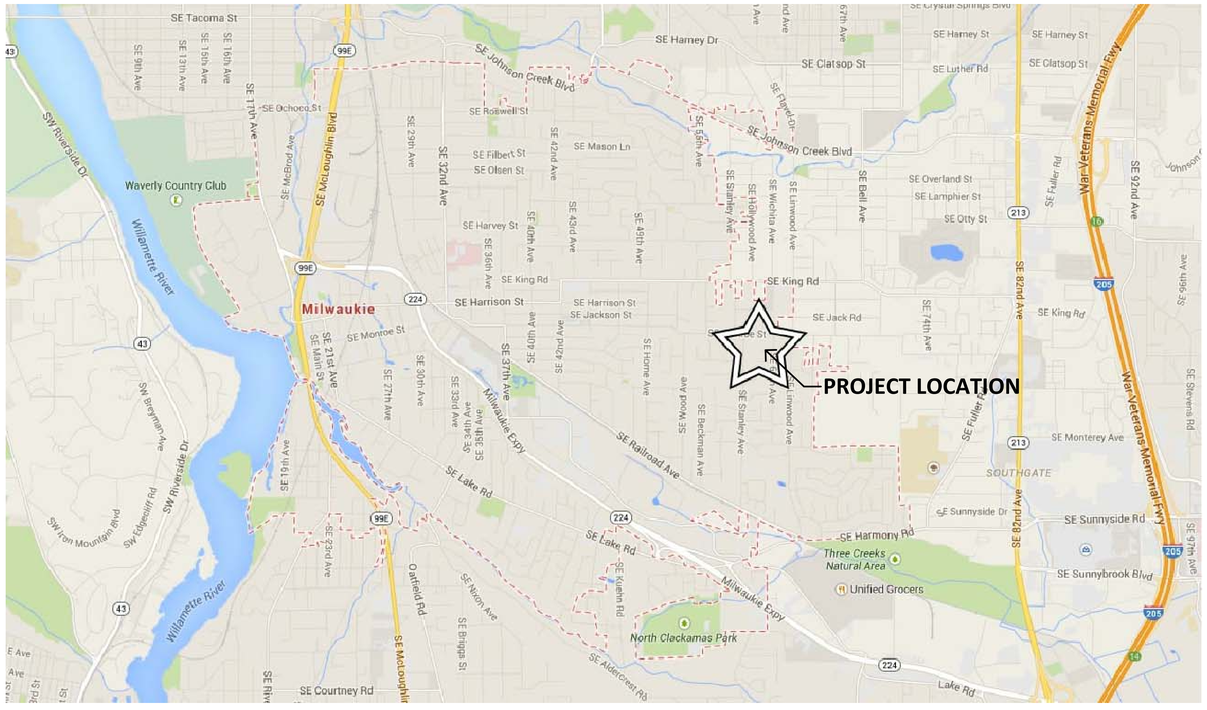
A. Use all means necessary to protect the materials of this section before, during and after installation and to protect installed work and materials of other trades.

B Clean up excess materials and debris from project site upon completion of work or sooner if directed.

C. Leave in a neat and tidy condition daily.

END OF SECTION

Wichita Park



VICINITY MAP

5908 SE Monroe Street
Milwaukie, Oregon 97222

UTILITY CONTACTS

Oregon Utility Notification Center 800-332-2344
(PGE, NW Natural Comcast, CenturyLink)

City of Milwaukie Public Works 503-786-7600
(Water, Sanitary and Storm Sewers)

CLIENT

North Clackamas Parks and Recreation District
150 Beavercreek Road
Oregon City, OR 97045

LANDSCAPE ARCHITECT

Lango Hansen Landscape Architects
1100 NW Glisan #3B
Portland, OR 97209
Contact: Brian Martin
e brian@langohansen.com
p 503.295.2437

CIVIL ENGINEER

KPFF Consulting Engineers
111 SW 5th Ave #2500
Portland, OR 97204

DRAWING INDEX

G0.1 Cover Sheet
G0.2 Existing Conditions
C0.1 Civil Notes
C1.0 Frontage Improvements Plan
C2.0 Utility Plan
C3.0 Civil Details
C3.1 Standard Details
C4.0 Erosion Control Plan
C4.1 Erosion Control Details
L0.1 Tree Protection + Demolition Plan
L1.1 Materials Plan
L2.1 Layout Plan
L3.1 Grading Plan
L4.1 Planting Plan
L5.1 Irrigation Plan
L6.1 Landscape Details
L6.2 Landscape Details
L6.3 Landscape Details
L6.4 Landscape Details

lango . hansen
LANDSCAPE ARCHITECTS PC
1100 nw glisan #3B portland OR 97209 T 503.295.2437

REGISTERED LANDSCAPE ARCHITECT
345
Kurt Lango
OREGON
3/20/96

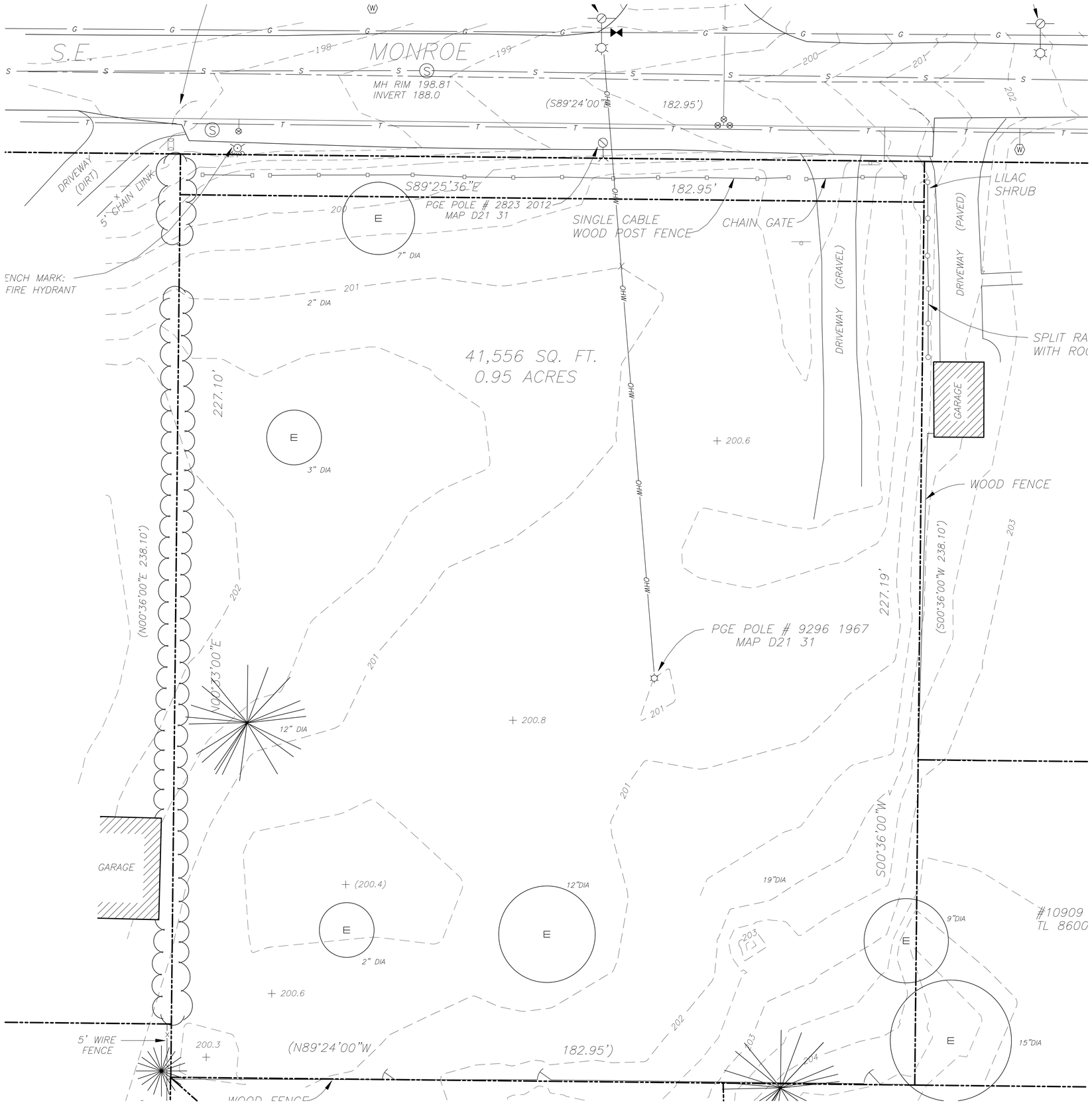
WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
PROJECT NO.	1723

SHEET
G0.1



LEGEND

- G — GAS LINE
- WATER LINE
- EOP — EDGE OF PAVEMENT
- S — SEWER LINE
- T — TELECOMMUNICATION LINE
- OHW — OVERHEAD ELECTRIC
- D — STORM DRAIN
- SUBJECT PROPERTY LINE
- MANHOLE
- WATER METER
- WATER VALVE
- GAS VALVE
- CB — CATCH BASIN
- IRON ROD WITH PLASTIC CAP
- FIRE HYDRANT
- POST – TRAFFIC SIGN
- MAIL BOX
- LIGHT POLE
- UTILITY POLE WITH LIGHT
- UTILITY POLE WITH GUY ANCHOR
- 3' WIDE HINGED GATE
- TREE–EVERGREEN – FIR
- TREE–DECIDUOUS – BIRCH
- TREE–DECIDUOUS – MAPLE
- TREE–DECIDUOUS – OAK
- TREE–DECIDUOUS – GLORYBOWER

SURVEY NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO BEGINNING WORK.

1 SURVEY AND EXISTING CONDITIONS

SCALE: 1" = 10'

0 5' 10' 20'

N

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Kurt Lango
OREGON
3/20/96

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

EXISTING CONDITIONS

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
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SHEET

G0.2

GENERAL NOTES

1. SURVEY PROVIDED BY HANER, ROSS & SPORSEEN, PC, DATED 8/25/14. ELEVATIONS ARE BASED ON TEMPORARY BENCH MARK (TOP SPINDLE OF FIRE HYDRANT) WITH AN ELEVATION OF 201.40.
2. PROJECT CONTROL SHALL BE FIELD VERIFIED AND CHECKED FOR RELATIVE HORIZONTAL POSITION PRIOR TO BEGINNING CONSTRUCTION LAYOUT.
3. WHEN DIMENSIONS AND COORDINATE LOCATIONS ARE REPRESENTED – DIMENSIONS SHALL HOLD OVER COORDINATE LOCATION. NOTIFY THE CIVIL ENGINEER OF RECORD IMMEDIATELY UPON DISCOVERY OF CONFLICTS.
4. BUILDING SETBACK DIMENSIONS FROM PROPERTY LINES SHALL HOLD OVER ALL OTHER CALLOUTS. PROPERTY LINES AND ASSOCIATED BUILDING SETBACKS SHALL BE VERIFIED PRIOR TO CONSTRUCTION LAYOUT.
5. CONTRACTOR SHALL PRESERVE AND PROTECT FROM DAMAGE ALL EXISTING MONUMENTATION DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PAYING FOR THE REPLACEMENT OF ANY MONUMENTS DAMAGED OR REMOVED DURING CONSTRUCTION. NEW MONUMENTS SHALL BE REESTABLISHED BY A LICENSED SURVEYOR.
6. SOME SITE DEMOLITION AND UTILITY RELOCATION MAY HAVE BEEN PERFORMED. SURVEY MAY NOT BE COMPLETE OR ACCURATE. CONTRACTOR TO VERIFY EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION.
7. CONTRACTOR TO REFERENCE INFILTRATION SERVICES REPORT BY HART CROWSER DATED JUNE 12, 2017 FOR THE SITE SOILS CONDITIONS.
8. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THESE PLANS, THE PROJECT SPECIFICATIONS AND THE APPLICABLE REQUIREMENTS OF THE 2015 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2014 OREGON PLUMBING SPECIALTY CODE AND REQUIREMENTS OF THE CITY OF MILWAUKIE.
9. THE COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES AND REGULATIONS. ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES FOR THE EXECUTION AND COMPLETION OF WORK SHALL BE SECURED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION.
10. ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952–001–0010 THROUGH OAR 952–001–0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232–1987). EXCAVATORS MUST NOTIFY ALL PERTINENT COMPANIES OR AGENCIES WITH UNDERGROUND UTILITIES IN THE PROJECT AREA AT LEAST 48 BUSINESS–DAY HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS PRIOR TO COMMENCING AN EXCAVATION, SO UTILITIES MAY BE ACCURATELY LOCATED.
11. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION ONLY AND ARE NOT GUARANTEED TO BE COMPLETE OR ACCURATE. CONTRACTOR SHALL VERIFY ELEVATIONS, PIPE SIZE, AND MATERIAL TYPES OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING WITH CONSTRUCTION AND SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF KPFF CONSULTING ENGINEERS, 72 HOURS PRIOR TO START OF CONSTRUCTION TO PREVENT GRADE AND ALIGNMENT CONFLICTS.
12. THE ENGINEER OR OWNER IS NOT RESPONSIBLE FOR THE SAFETY OF THE CONTRACTOR OR HIS CREW. ALL O.S.H.A. REGULATIONS SHALL BE STRICTLY ADHERED TO IN THE PERFORMANCE OF THE WORK.
13. TEMPORARY AND PERMANENT EROSION CONTROL MEASURES SHALL BE IMPLEMENTED. THE CONTRACTOR SHALL ADHERE TO CITY OF MILWAUKIE REQUIREMENTS FOR MINIMUM EROSION CONTROL MEASURES. THE ESC FACILITIES SHOWN IN THESE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.
14. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ROADWAYS, KEEPING THEM CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, AND PROVIDING DUST CONTROL AS REQUIRED.
15. TRAFFIC CONTROL SHALL BE PROVIDED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO CITY OF MILWAUKIE FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION.
16. CONTRACTOR SHALL MAINTAIN ALL UTILITIES TO ADJACENT PROPERTIES AT ALL TIMES DURING CONSTRUCTION.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND SCHEDULING ALL WORK WITH THE OWNER.
18. NOTIFY CITY INSPECTOR 72 HOURS BEFORE STARTING WORK.

CONSTRUCTION NOTES

GENERAL

1. ACTUAL LINES AND GRADES SHALL BE STAKED BY A PROFESSIONAL SURVEYOR, REGISTERED IN THE STATE OF OREGON, BASED ON DIMENSIONS, ELEVATIONS AND BEARINGS AS SHOWN ON THE PLANS.
2. SUBGRADE AND TRENCH BACKFILL SHALL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D–698. FLOODING OR JETTING THE BACKFILLED TRENCHES WITH WATER IS NOT PERMITTED.
3. SPECIAL INSPECTION REQUIRED FOR ALL COMPACTION TESTING.

DEMOLITION

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION AND DISPOSAL OF EXISTING AC, CURBS, SIDEWALKS AND OTHER SITE ELEMENTS WITHIN THE SITE AREA IDENTIFIED IN THE PLANS.
2. EXCEPT FOR MATERIALS INDICATED TO BE STOCKPILED OR TO REMAIN ON OWNER'S PROPERTY, CLEARED MATERIALS SHALL BECOME CONTRACTOR'S PROPERTY, REMOVED FROM THE SITE, AND DISPOSED OF PROPERLY.
3. ITEMS INDICATED TO BE SALVAGED SHALL BE CAREFULLY REMOVED AND DELIVERED STORED AT THE PROJECT SITE AS DIRECTED BY THE OWNER.
4. ALL LANDSCAPING, PAVEMENT, CURBS AND SIDEWALKS, BEYOND THE IDENTIFIED SITE AREA, DAMAGED DURING THE CONSTRUCTION SHALL BE REPLACED TO THEIR ORIGINAL CONDITION OR BETTER.
5. CONCRETE SIDEWALKS SHOWN FOR DEMOLITION SHALL BE REMOVED TO THE NEAREST EXISTING CONSTRUCTION JOINT.
6. SAWCUT STRAIGHT MATCHLINES TO CREATE A BUTT JOINT BETWEEN THE EXISTING AND NEW PAVEMENT.

UTILITIES

1. ADJUST ALL INCIDENTAL STRUCTURES, MANHOLES, VALVE BOXES, CATCH BASINS, FRAMES AND COVERS, ETC. TO FINISHED GRADE.
2. CONTRACTOR SHALL ADJUST ALL EXISTING AND/OR NEW FLEXIBLE UTILITIES (WATER, TV, TELEPHONE, ELEC., ETC.) TO CLEAR ANY EXISTING OR NEW GRAVITY DRAIN UTILITIES (STORM DRAIN, SANITARY SEWER, ETC.) IF CONFLICT OCCURS.
3. CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES FOR THE ADJUSTMENT TO GAS, ELECTRICAL, POWER AND TELEPHONE SERVICE AS NEEDED.
4. BEFORE BACKFILLING ANY SUBGRADE UTILITY IMPROVEMENTS CONTRACTOR SHALL SURVEY AND RECORD MEASUREMENTS OF EXACT LOCATION AND DEPTH AND SUBMIT TO ENGINEER AND OWNER.

STORM

1. CONNECTIONS TO EXISTING STORM SEWERS SHALL CONFORM TO THE 2015 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 00490, "WORK ON EXISTING SEWERS AND STRUCTURES".
2. BEGIN LAYING STORM DRAIN SEWER PIPE AT THE LOW POINT OF THE SYSTEM, TRUE TO GRADE AND ALIGNMENT INDICATED WITH UNBROKEN CONTINUITY OF INVERT. THE CONTRACTOR SHALL ESTABLISH LINE AND GRADE FOR THE STORM SEWER PIPE USING A LASER.

MATERIAL NOTES

1. GENERAL: MATERIALS SHALL BE NEW. THE USE OF MANUFACTURER'S NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, AND USEFULNESS. PROPOSED SUBSTITUTIONS WILL REQUIRE WRITTEN APPROVAL FROM LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. STORM SEWER PIPING SHALL BE PVC PIPE OR HIGH DENSITY POLYETHYLENE (HDPE) PIPE CONFORMING TO THE PROJECT SPECIFICATIONS.
3. CONCRETE FOR CURBS AND SIDEWALK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,300 PSI AT 28 DAYS.

VEGETATED STORMWATER FACILITY NOTE

1. SUCCESSFUL CONSTRUCTION OF THE VEGETATED STORMWATER FACILITY DEPEND ON PROPER CONSTRUCTION SEQUENCING, MATERIALS, INSTALLATION, PROTECTION OF SUBGRADE AND EROSION CONTROL.
2. SUBMITTAL REQUIREMENT: SUBMIT (1) 2 GALLON SAMPLE OF GROWING MEDIUM THAT MEETS THE SOIL SPECIFICATION FOR INFILTRATION TESTING BY KPFF.

UNDERGROUND INJECTION CONTROL (UIC) NOTE

THIS PROJECT CONTAINS A UIC (UNDERGROUND INJECTION CONTROL) FACILITY TO DISPOSE OF STORMWATER RUNOFF BY INFILTRATING STORMWATER BELOW THE GROUND SURFACE. UIC'S ARE REGULATED UNDER THE SAFE DRINKING WATER ACT WHICH IS ADMINISTERED BY DEQ. ALL UICS MUST BE REGISTERED WITH DEQ AND RECORDED WITH THE CITY OF PORTLAND. THIS FACILITY MUST BE INSTALLED CORRECTLY AND PROTECTED DURING CONSTRUCTION TO PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE FACILITY.

ABBREVIATIONS

AC	ASPHALT CONCRETE	OF	OUTFALL
AD	AREA DRAIN	OVH/OH	OVERHEAD
APPROX	APPROXIMATE	P/L	PROPERTY LINE
B	BOLLARD	PC	POINT OF CURVATURE
BLDG	BUILDING	PCC	POINT OF COMPOUND CURVATURE
BOF	BOTTOM OF FACILITY	PCR	POINT OF CURB RETURN
BOW	BACK OF WALK	PED	PEDESTRIAN
BS	BOTTOM OF SWALE BOTTOM OF STAIR	PIV	POST INDICATOR VALVE
		PM	PARKING METER
BW	BOTTOM OF WALL	POC	POINT ON CURVE
CB	CATCH BASIN	PP	POWER POLE
CL	CENTERLINE	PRC	POINT OF REVERSE CURVATURE
CMP	CORRUGATED METAL PIPE	PT	POINT OF TANGENT
CMU	CONCRETE MASONRY UNIT	P.U.E	PUBLIC UTILITY EASEMENT
CO	CLEANOUT	PVC	POLYVINYL CHLORIDE
COM	CITY OF MILWAUKIE	PVMT	PAVEMENT
CONC.	CONCRETE	PVT	PRIVATE
COTG	CLEANOUT TO GRADE	R	RIM
CP	CONTROL POINT	RD	ROOF DRAIN
Δ	DELTA	R.O.W	RIGHT–OF–WAY
D/W	DRIVEWAY	S	SLOPE (FT/FT)
DIA.,Ø	DIAMETER	SD	STORM DRAIN
DIP	DUCTILE IRON PIPE	SDMH	STORM DRAIN MANHOLE
E	EASTING	SHT	SHEET
EXIST./EX	EXISTING	SS	SANITARY SEWER
FDC	FIRE DEPARTMENT CONNECTION	SSMH	SANITARY SEWER MANHOLE
FF	FINISH FLOOR ELEVATION	ST	STREET
FG	FINISH GRADE	STA	STATION
FH	FIRE HYDRANT	STD	STANDARD
FL	FLOWLINE	S/W	SIDEWALK
FND	FOUNDATION	TC	TOP OF CURB
G	GUTTER	TD	TRENCH DRAIN
GB	GRADE BREAK	TG	TOP OF GROUND
GL	GAS LINE	TP	TOP OF PAVEMENT
GV	GATE VALVE	TRANS.	TRANSFORMER
H	HEIGHT	TS	TOP OF STAIR
HCP	HANDICAP PARKING SPACE	TW	TOP OF WALL TOP OF WALK
HP	HIGH POINT	TYP	TYPICAL
ID	INSIDE DIAMETER	UG	UNDERGROUND
IE	INVERT ELEVATION	UGE	UNDERGROUND ELECTRIC
INV	INVERT	W	WATER
IRR.	IRRIGATION	W/	WITH
LP	LIGHT POLE	WCR	WHEEL CHAIR RAMP
MH	MANHOLE	WM	WATER METER
MIN	MINIMUM	WV	WATER VALVE
N	NORTHING		
O.D	OUTSIDE DIAMETER		

NOTICE TO EXCAVATORS:
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

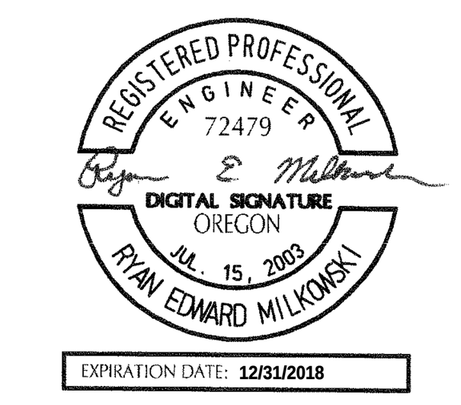
Dig Safely.

Call the Oregon One-Call Center
1-800-332-2344

EMERGENCY TELEPHONE NUMBERS

NW NATURAL GAS	
M-F 7am-6pm	503-226-4211 Ext.4313
AFTER HOURS	503-226-4211
PGE	503-464-7777
CENTURYLINK	1-800-573-1311
CITY BUREAU OF MAINTENANCE	503-823-1700
CITY WATER	503-823-4874
VERIZON	1-800-483-1000

kpff
111 SW Fifth Ave., Suite 2500
Portland, OR 97204
O: 503.227.3251
F: 503.224.4681
www.kpff.com



WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

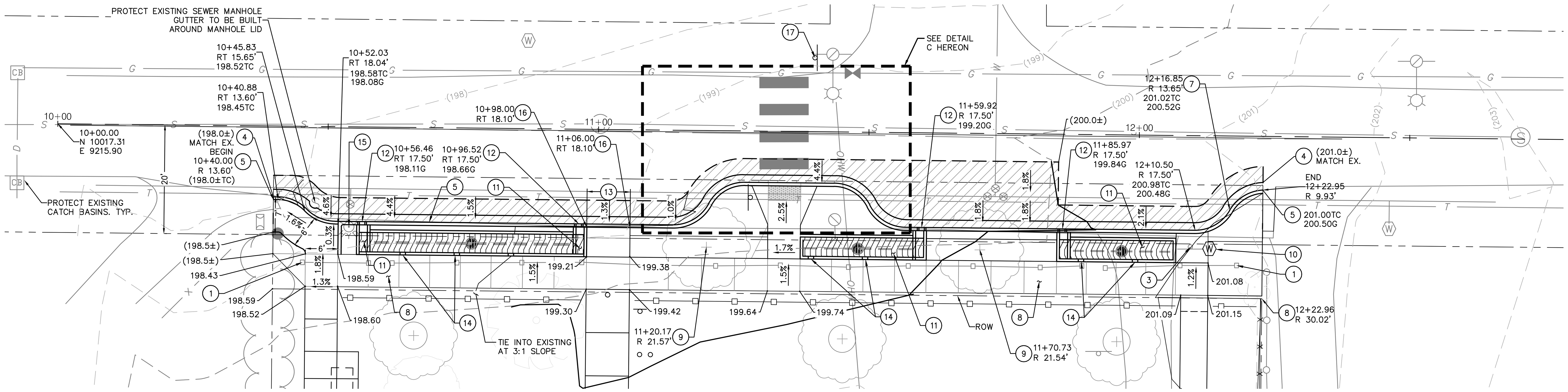
CIVIL NOTES

REVISIONS

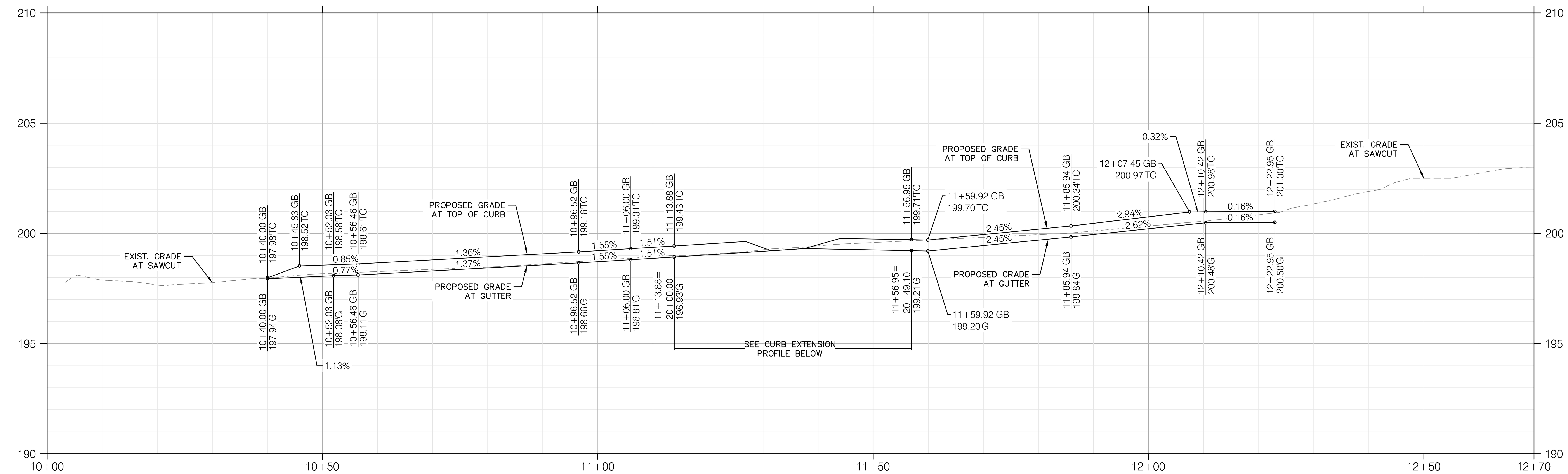
SCALE	**AS SHOWN**
DRAWN BY	**REM**
DATE	**03/01/18**
PROJECT NO.	**1434**

SHEET

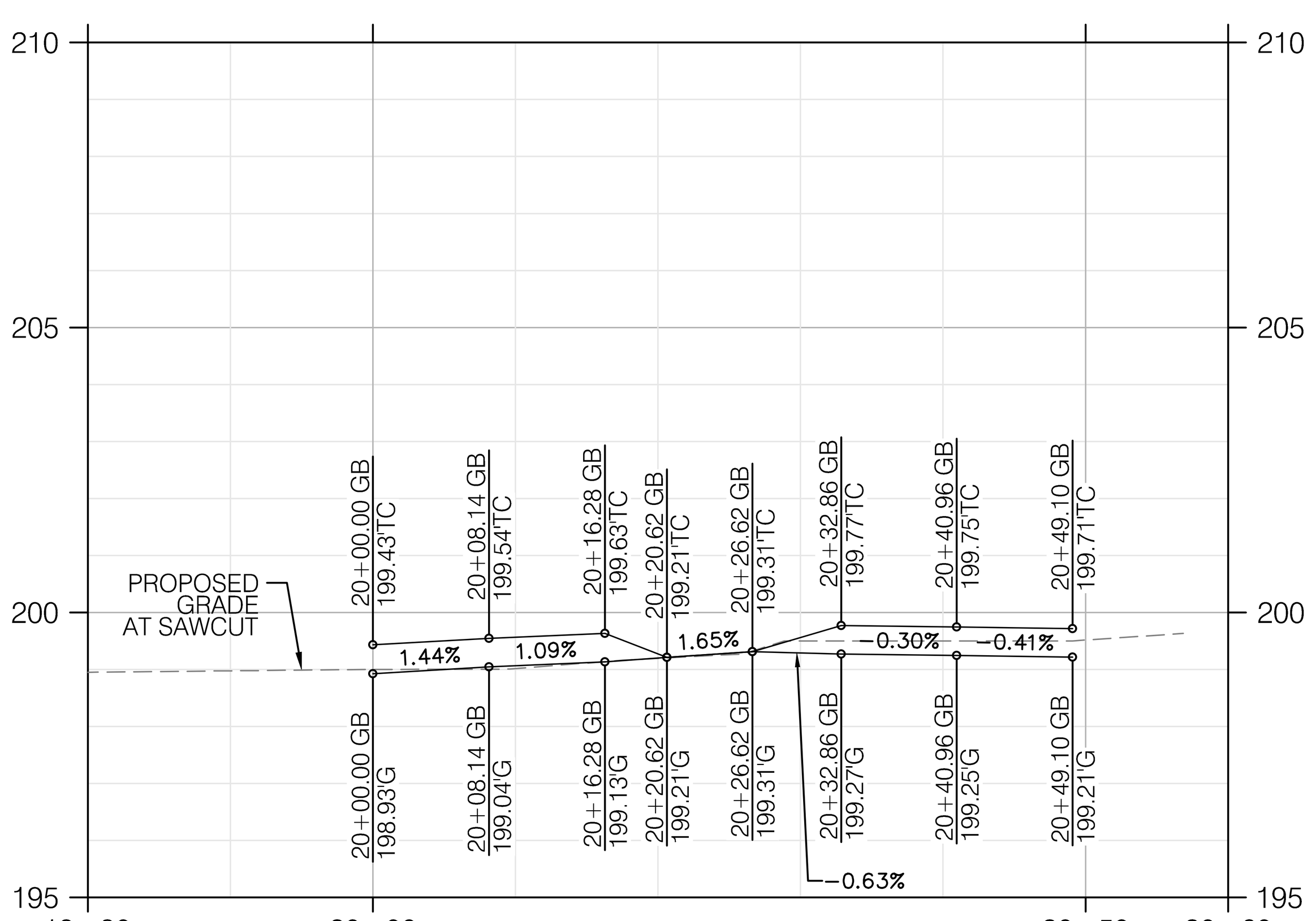
C0.1



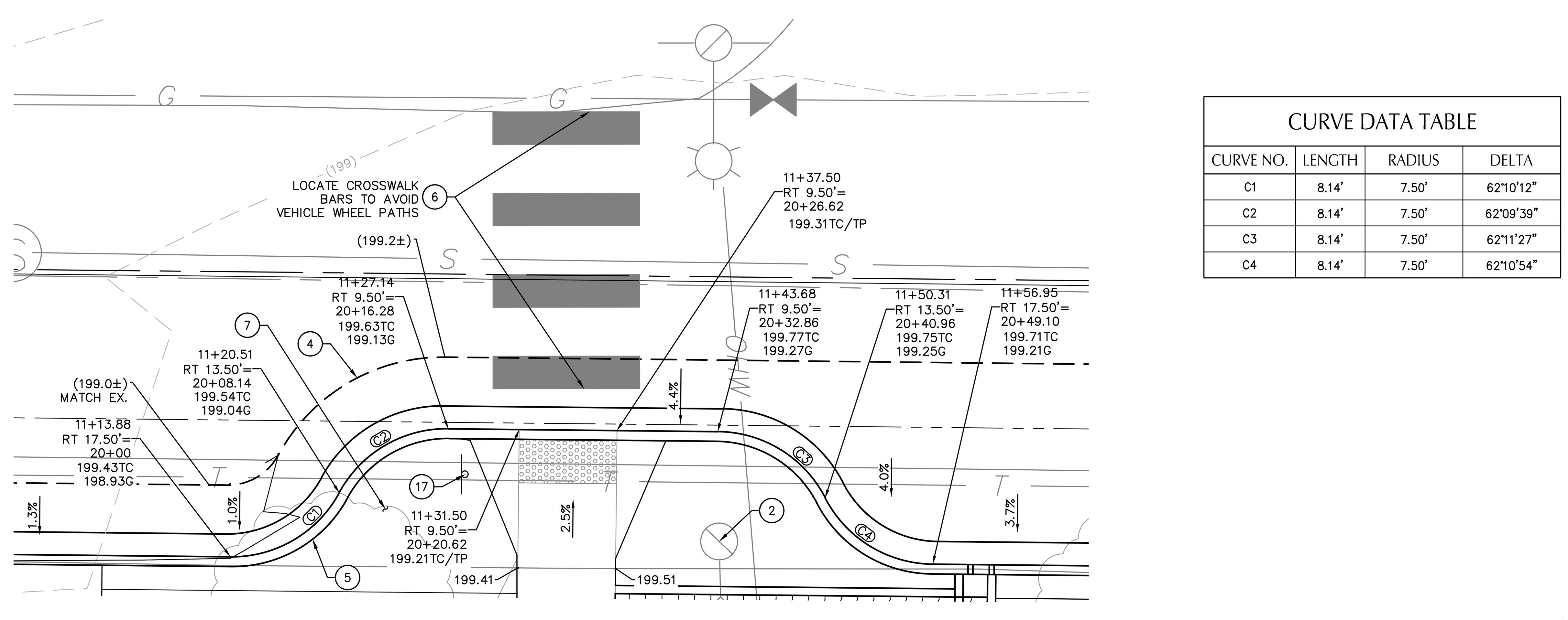
1 PLAN
SCALE: 1" = 10'



2 PROFILE
SCALE: HORZ: 1" = 10'
VERT: 1" = 2'



3 CURB EXTENSION PROFILE
SCALE: HORZ: 1" = 10'
VERT: 1" = 2'



4 DETAIL C
SCALE: 1" = 5'

KEY NOTES

NOTE	DESCRIPTION	DETAIL REF.
1	REMOVE EXISTING FENCE	
2	EXISTING POWER POLE TO BE PROTECTED	
3	REMOVE EXISTING SIGN AND DELIVER TO OWNER	
4	SAWCUT AND MATCH EXISTING PAVEMENT	
5	CONSTRUCT STANDARD CURB AND GUTTER	500/C3.1
6	CONSTRUCT STAGGERED CONTINENTAL CROSSWALK 2' WHITE BARS	520/C3.1
7	CONSTRUCT MID-BLOCK CURB EXTENSION	508/C3.1
8	CONSTRUCT SIDEWALK	504/C3.1
9	TREES PER LANDSCAPING PLANS	
10	SALVAGE EX. WATER METER BOX FOR IMPROVEMENTS. RELOCATE AS REQUIRED	
11	CONSTRUCT WATER QUALITY FACILITY WITH SEDIMENTATION FOREBAY	8/C3.0 625(SIM)/C3.1
12	CONSTRUCT CURB SPILLWAY	5/C3.0
13	CONSTRUCT ROLLED CURB AND GUTTER	10/C3.0
14	CONSTRUCT CURB CUTS 10' OC OR AT LOW POINTS	6/C3.0
15	PROTECT EX. FIRE HYDRANT. CONSTRUCT STORM FACILITY TO AVOID IT	
16	CONSTRUCT STANDARD CURB TO ROLLED CURB TRANSITION	14/C3.0
17	INSTALL PEDESTRIAN CROSS WALK SIGN	15/C3.0 525/C3.1

SHEET NOTES

1. LANDINGS ON ACCESSIBLE ROUTES SHALL NOT EXCEED 2% IN ANY DIRECTION.
2. ALL ACCESSIBLE ROUTES SHALL COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES (ADAAG).

GRADING LABEL LEGEND

CALLOUT	DESCRIPTION
X.X%	GRADING SLOPE AND DIRECTION (DOWNHILL)
XX.XX XX	SPOT ELEVATION; DESCRIPTION LISTED BELOW. NO DESCRIPTION MEANS TP OR TG
BOT	BOTTOM OF POND
BOW	BACK OF WALK
BS	BOTTOM OF STEP
BW	BOTTOM OF WALL
EG	EXISTING GRADE
FFE	FINISHED FLOOR
FL	FLOW LINE
G	GUTTER
HP	HIGH POINT
LP	LOW POINT
RIM	RIM OF STRUCTURE
TC	TOP OF CURB
TG	TOP OF GROUND
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP WALL
(XXX.X±)	EXISTING GRADE (MATCH WHERE APPLICABLE)

SHEET LEGEND

(49)	EX. CONTOUR MINOR
(50)	EX. CONTOUR MAJOR
49	CONTOUR MINOR (FG)
50	CONTOUR MAJOR (FG)
(hatch)	SAWCUT, REMOVE AND REPLACE ASPHALT

CURVE DATA TABLE

CURVE NO.	LENGTH	RADIUS	DELTA
C1	8.14'	7.50'	62°10'12"
C2	8.14'	7.50'	62°09'39"
C3	8.14'	7.50'	62°11'27"
C4	8.14'	7.50'	62°10'54"

SCALE 1 INCH = 10 FEET
10 0 10 20

kpff
111 SW Fifth Ave., Suite 2500
Portland, OR 97204

REGISTERED PROFESSIONAL ENGINEER 72479 OREGON
RYAN EDWARD MILKOWSKI
DIGITAL SIGNATURE
EXPIRATION DATE: 12/31/2018

WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

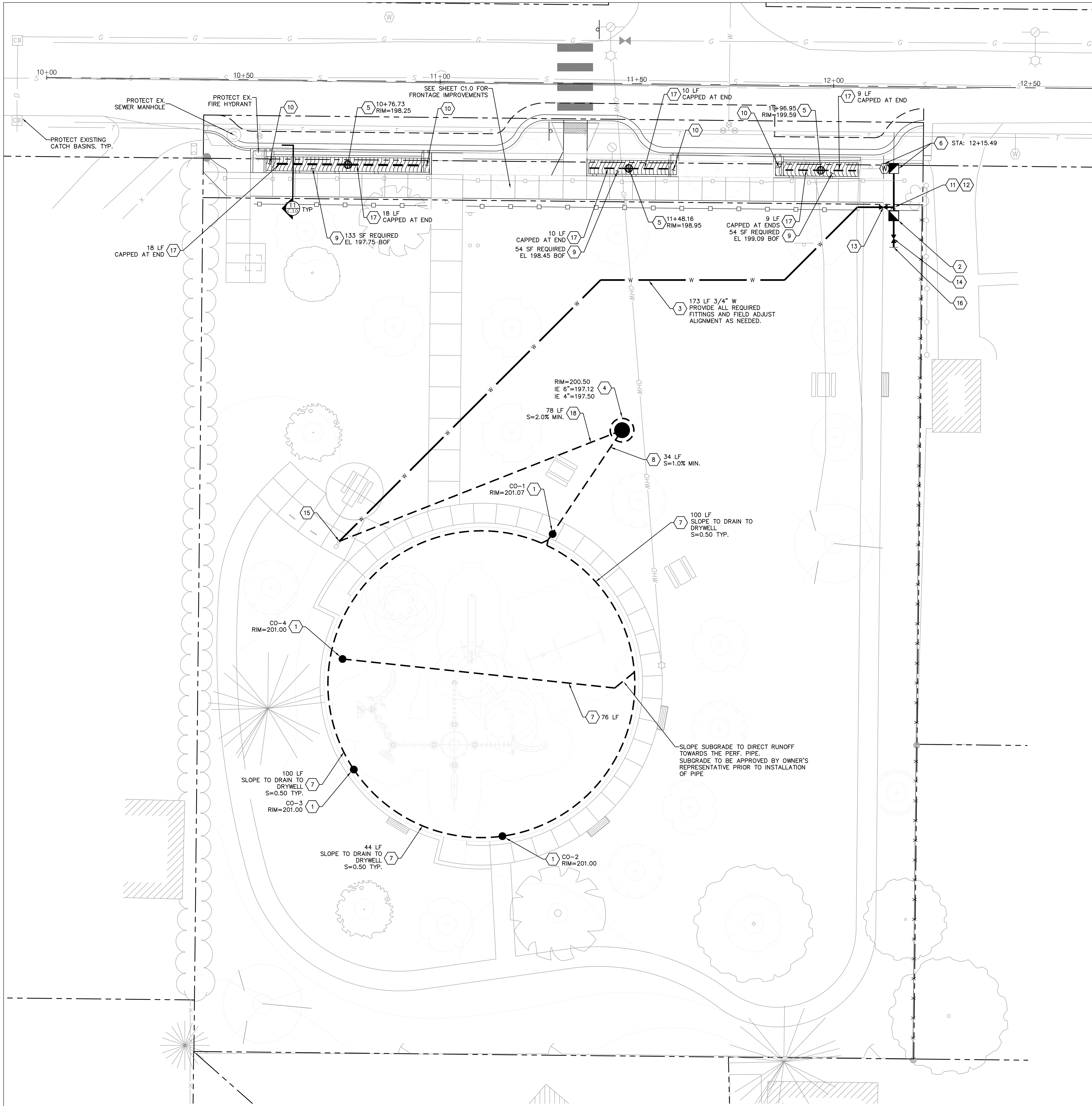
BID SET

FRONTAGE IMPROVEMENT PLAN

REVISIONS

SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET
C1.0



SHEET NOTES

1. UTILITIES LOCATED WITHIN THE ROW SHALL BE CONSTRUCTED PER CITY OF MILWAUKIE STANDARDS.
2. PIPE BEDDING AND BACKFILL FOR ALL SOLID WALL UTILITIES SHALL BE CONSTRUCTED PER DETAIL 8/C3.0.
3. STRUCTURE LOCATIONS ARE BASED ON CONTROL OF STRUCTURE.
4. CONTRACTOR TO WASTE EXCESS SOIL ON SITE. GRADE TO DRAIN AND MINIMIZE SLOPES. COORDINATE WITH LANDSCAPE ARCHITECT.

(X) KEY NOTES

NOTE	DESCRIPTION	DETAIL REF.
1	CONSTRUCT CLEANOUT	1/C3.0
2	CONSTRUCT DOUBLE CHECK BACKFLOW ASSEMBLY	2/C3.0
3	CONSTRUCT 3/4" PIPE	
4	CONSTRUCT DRYWELL	7/C3.0
5	CONSTRUCT OVERFLOW RISER	4/C3.0
6	COORDINATE WITH CITY OF MILWAUKIE TO TERMINATE OLD SERVICE AND TO INSTALL A 1" WATER SERVICE TAP.	401/C3.1
7	INSTALL 12" ADS ADVANEDGE PIPE	3/C3.0
8	CONSTRUCT 6" STORM PIPE	
9	CONSTRUCT WATER QUALITY FACILITY	8/C3.0
10	CONSTRUCT SEDIMENTATION FOREBAY	625/C3.1
11	FURNISH AND INSTALL 1"X1" TEE	
12	FURNISH AND INSTALL 1"X3/4" REDUCER	
13	FURNISH AND INSTALL 3/4" VALVE	
14	FURNISH AND INSTALL 1" VALVE	
15	DRINKING FOUNTAIN CONNECTION PER LANDSCAPING PLANS (ADD ALTERNATE ITEM)	
16	IRRIGATION CONNECTION PER LANDSCAPING PLANS	
17	INSTALL PERFORATED 4" DRAIN PIPE	
18	INSTALL 4" STORM PIPE AND ALL REQUIRED FITTINGS FOR DRINKING FOUNTAIN DRAIN (ADD ALTERNATIVE ITEM)	

STORM DRAIN STRUCTURE TABLE		
ID	NORTHING	EASTING
DRYWELL	9362.1	9927.7
CO-1	9344.5	9901.3
CO-2	9331.7	9824.4
CO-3	9293.9	9841.4
CO-4	9291.1	9869.5

kpff

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REGISTERED PROFESSIONAL ENGINEER 72479 OREGON RYAN EDWARD MILKOWSKI
DIGITAL SIGNATURE
EXPIRATION DATE: 12/31/2018

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

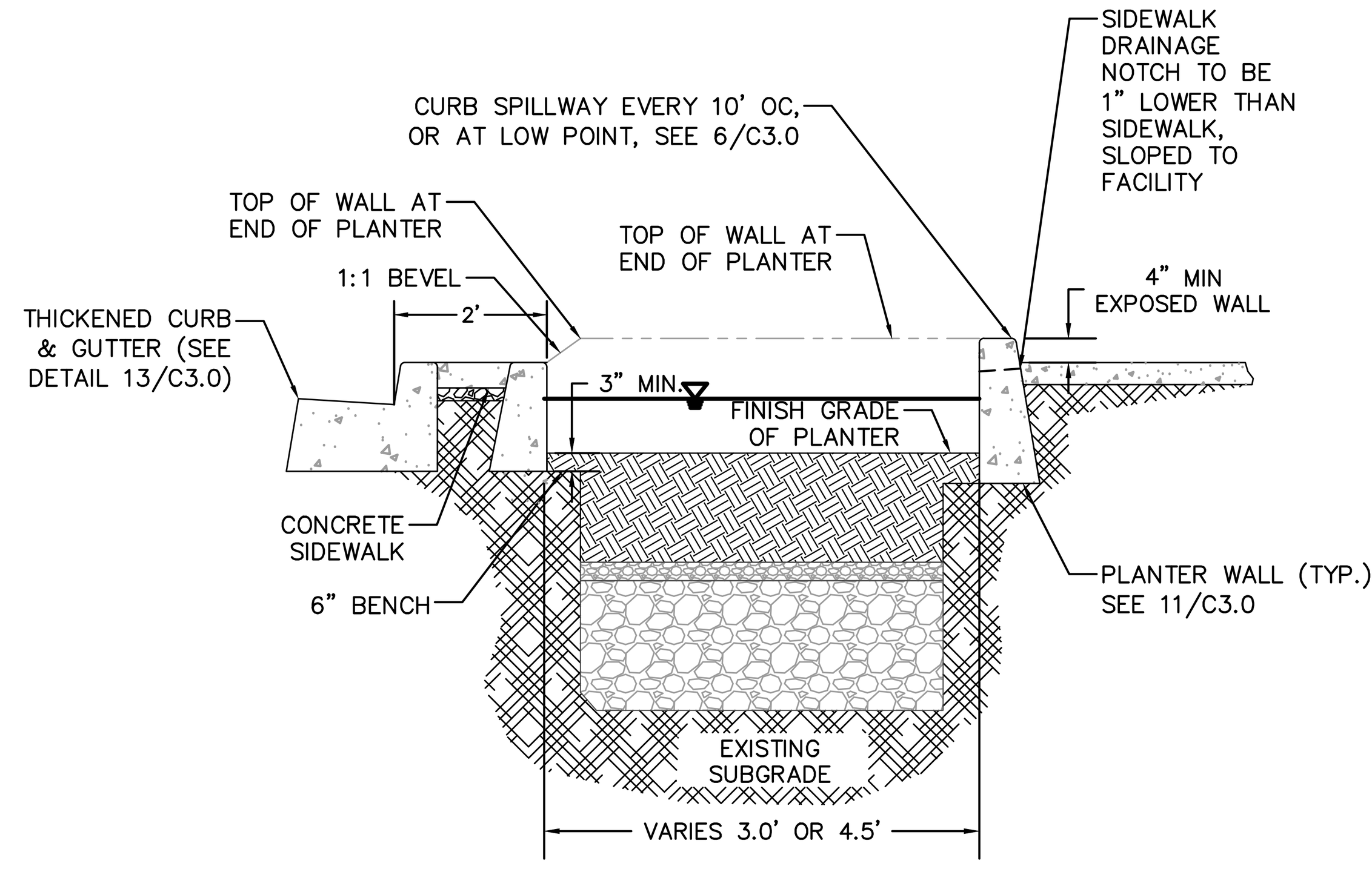
UTILITY PLAN

REVISIONS

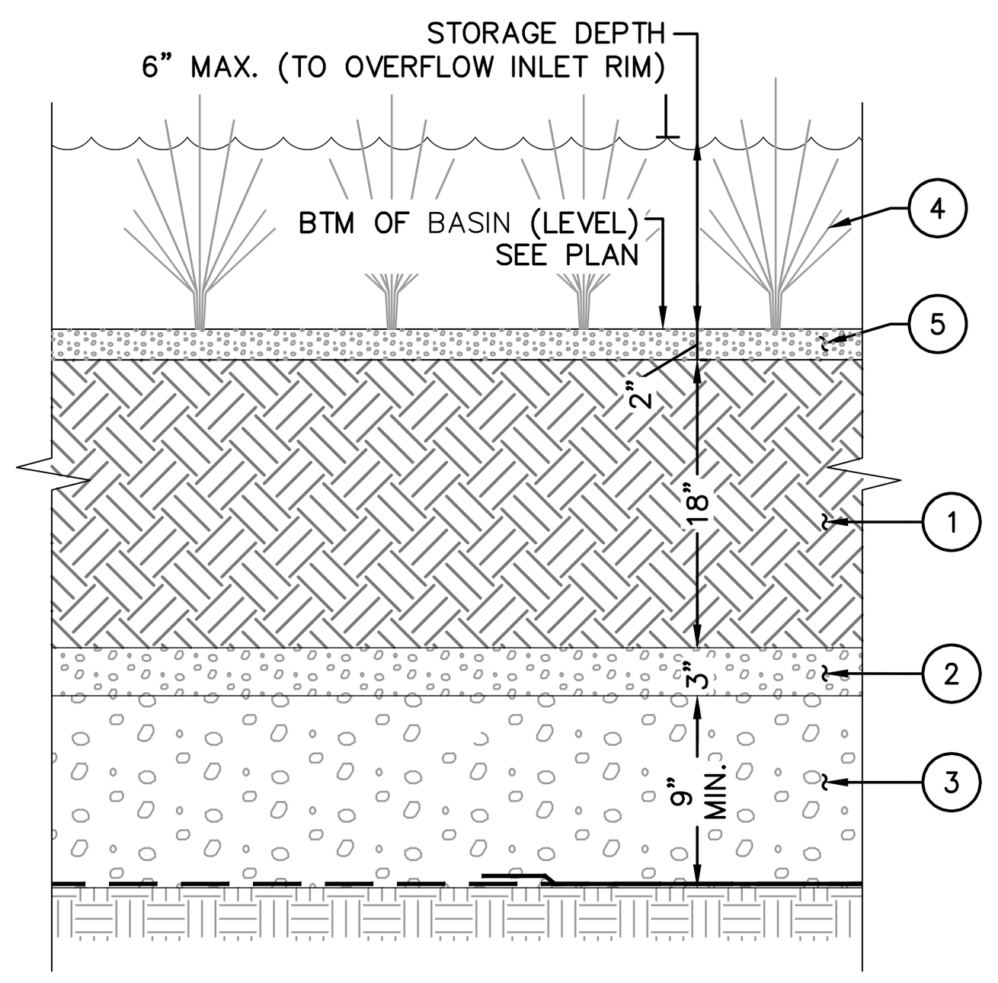
SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET

C2.0



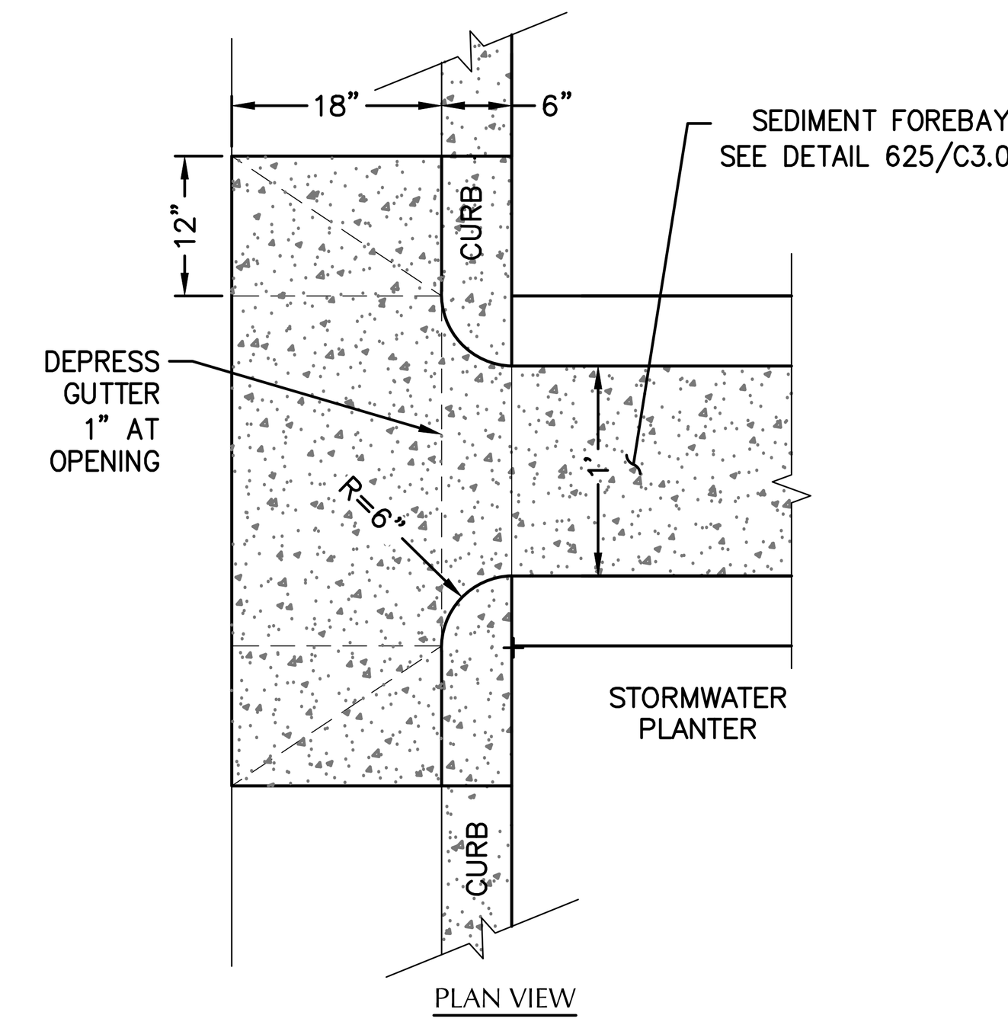
12 STORMWATER FACILITY SECTION
SCALE: NTS



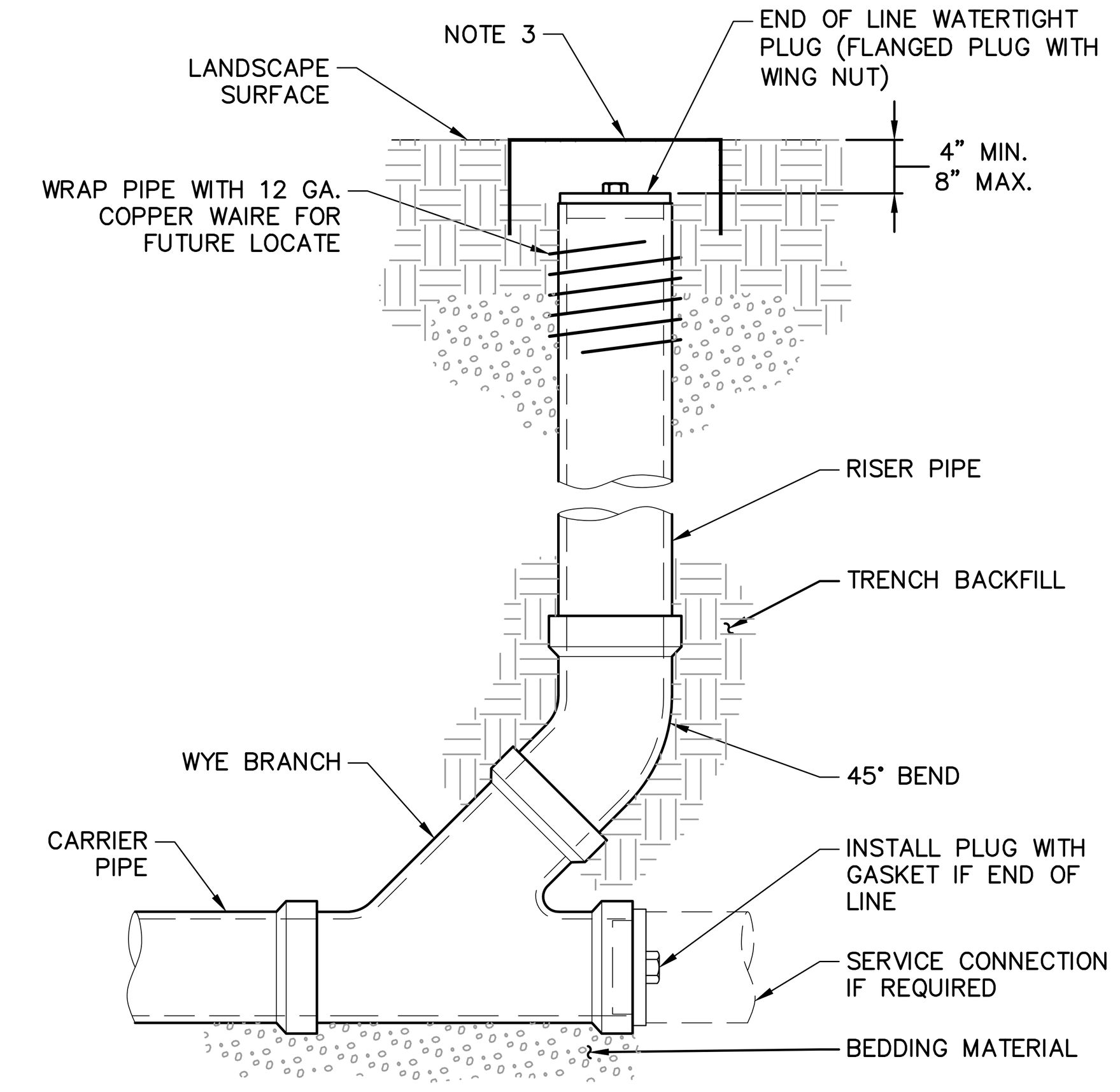
X KEY NOTES

1 STORMWATER FACILITY GROWING MEDIA PER SPECS.
2 DRAINAGE LENS COURSE (3/4" – NO. 4 OPEN GRADED AGGREGATE).
3 DRAINAGE FILL PER SPECS.
4 PLANTING SEE LANDSCAPE PLANS.
5 PEA GRAVEL PER LANDSCAPE PLANS (2" DEPTH).

8 WATER QUALITY FACILITY
SCALE: NTS

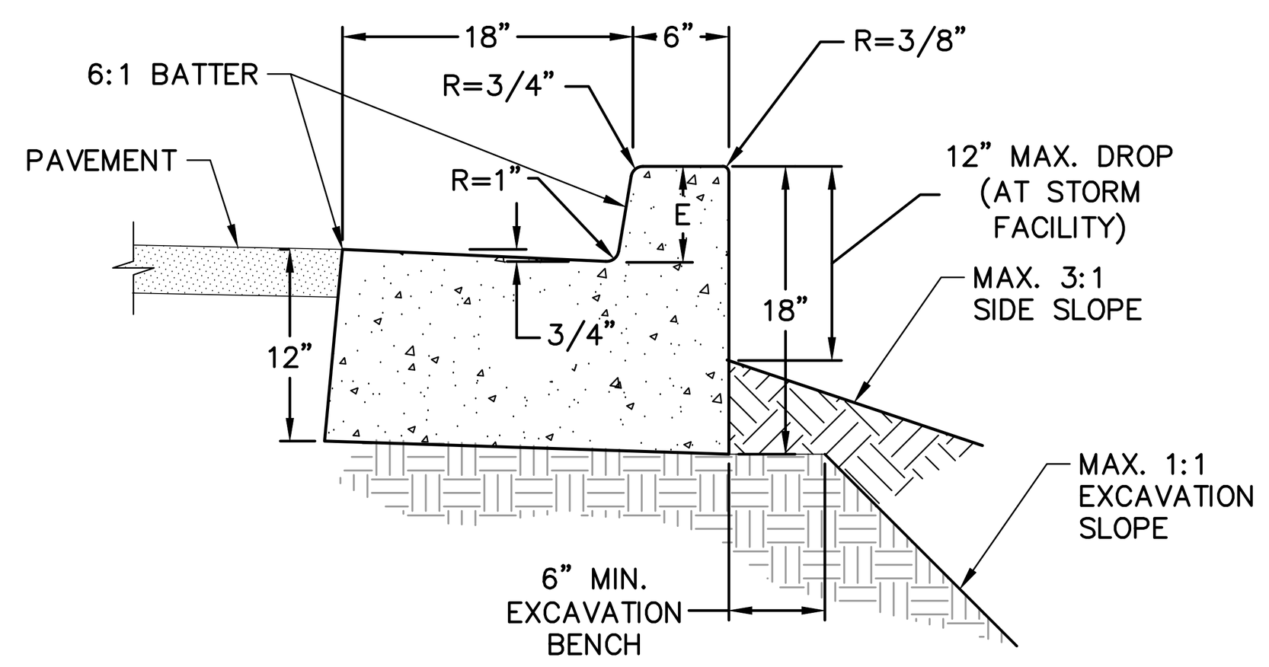


5 CURB SPILLWAY
SCALE: NTS



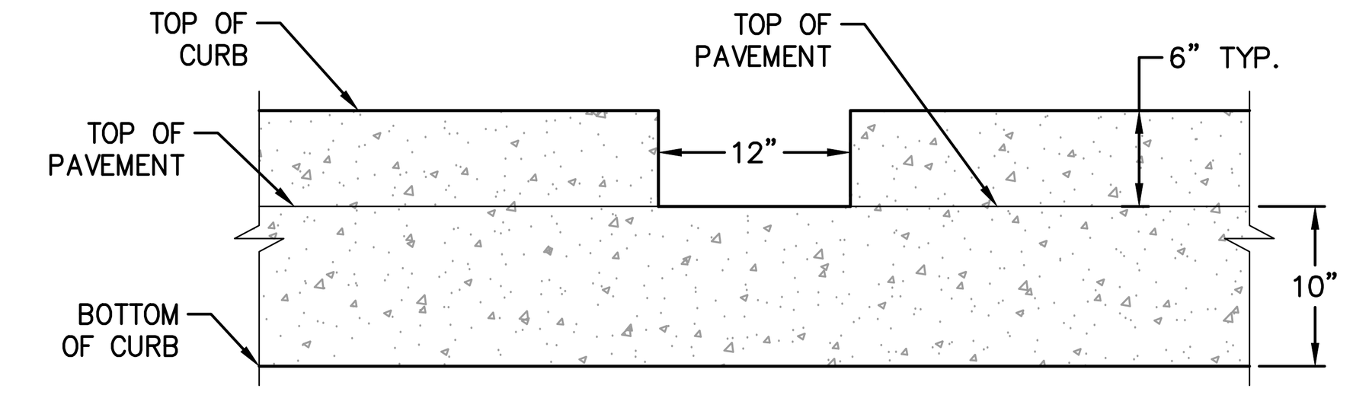
NOTES:
1. RISER PIPE SIZE TO MATCH CARRIER PIPE.
2. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.
3. 10" DIA. HDPE METER BOX ENCLOSURE (CARLSON TRUSS-T 011 W/ TWIST-N-LOCK COVER AND BODY, PEDESTRIAN RATED, OR APPROVED EQUAL).

1 CLEANOUT
SCALE: NTS

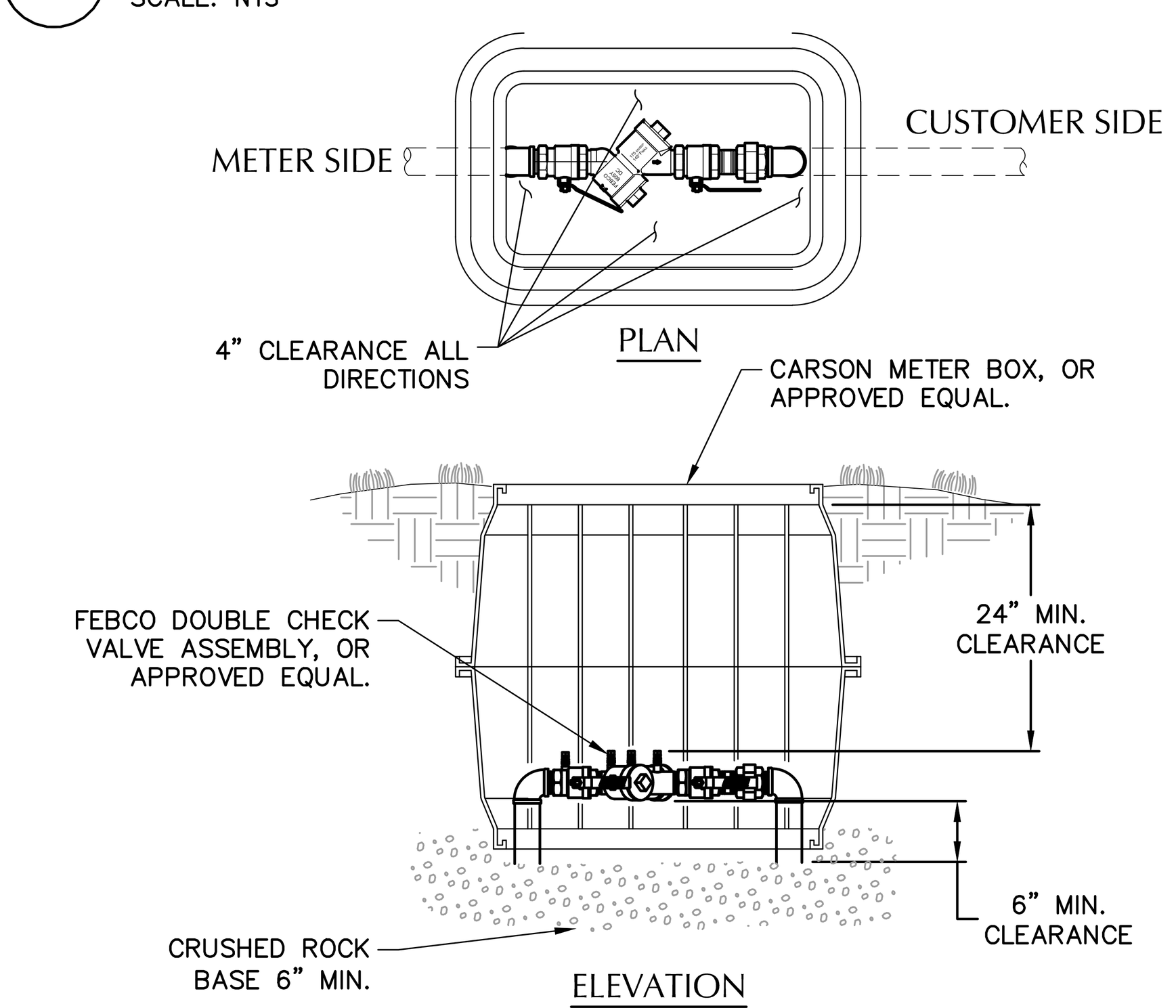


NOTES:
1. CURB EXPOSURE 'E' = 6", TYP. VARY AS SHOWN ON PLANS OR AS DIRECTED.
2. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
3. TOPS OF ALL CURBS SHALL SLOPE TOWARD THE ROADWAY AT 2% UNLESS OTHERWISE SHOWN OR AS DIRECTED.
4. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM WITH CURB MACHINE AS APPROVED BY THE ENGINEER.

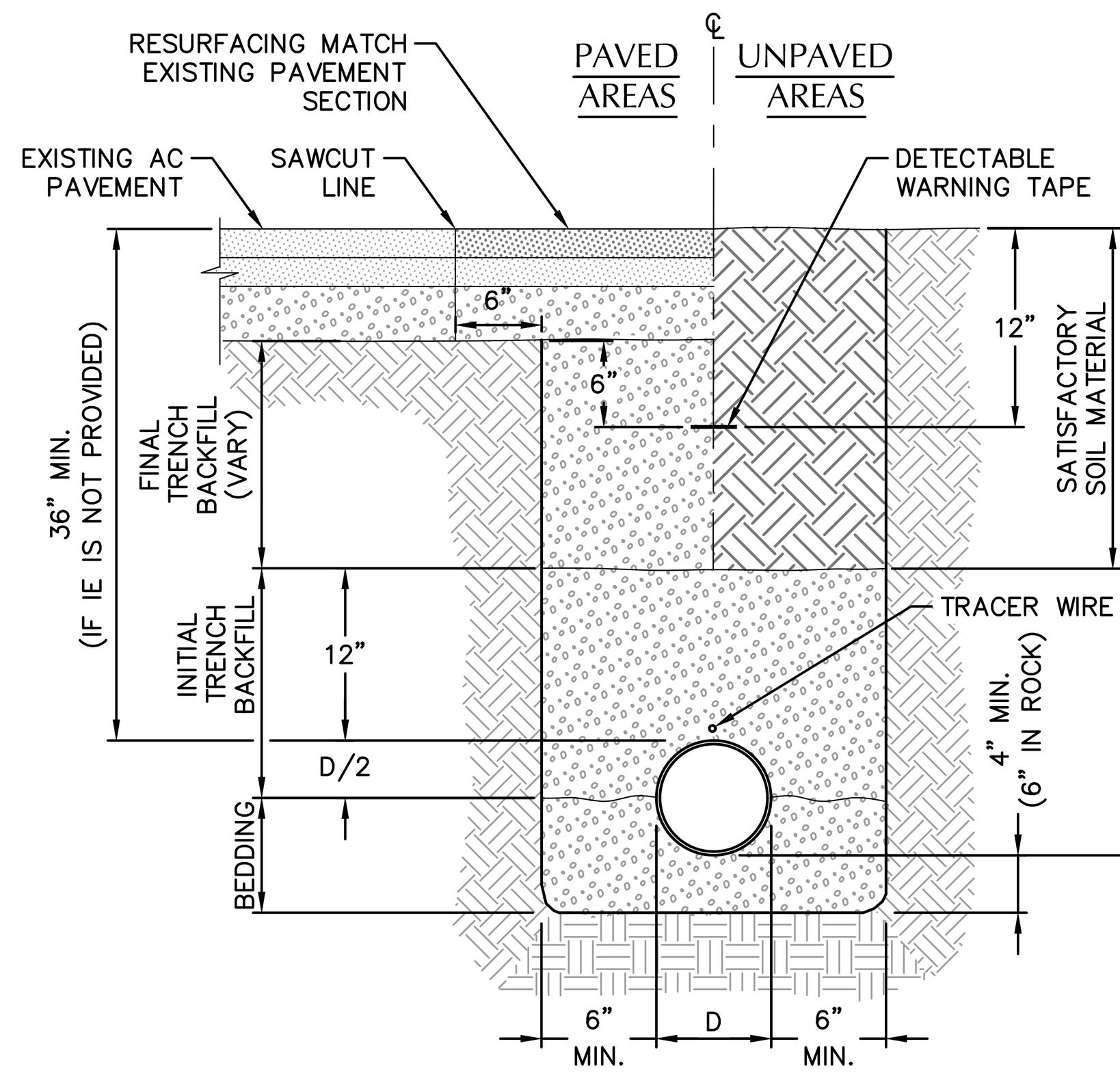
13 THICKENED CURB
SCALE: NTS



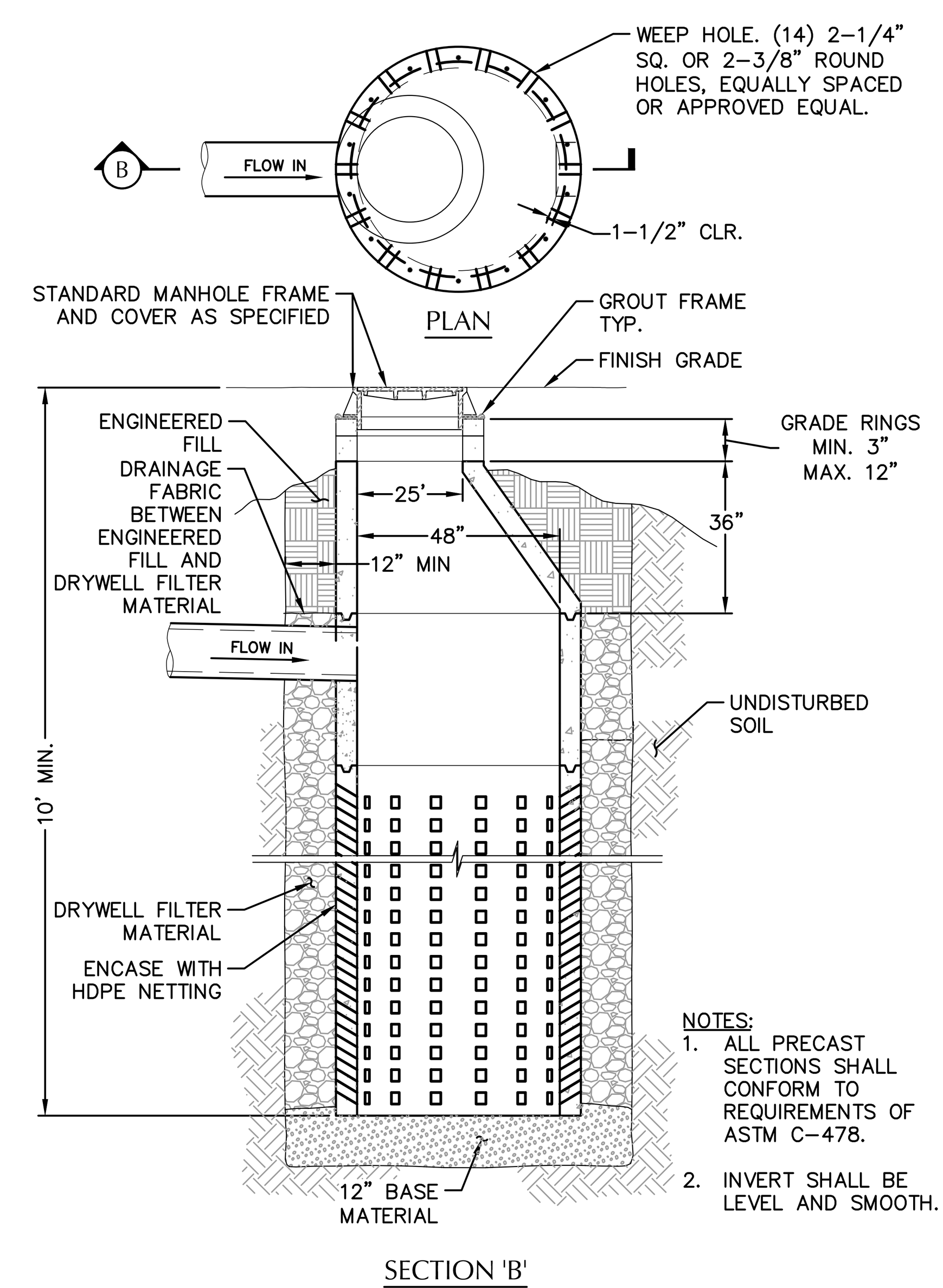
6 PLANTER CURB CUT
SCALE: NTS



2 DOUBLE CHECK BACKFLOW ASSEMBLY
SCALE: NTS

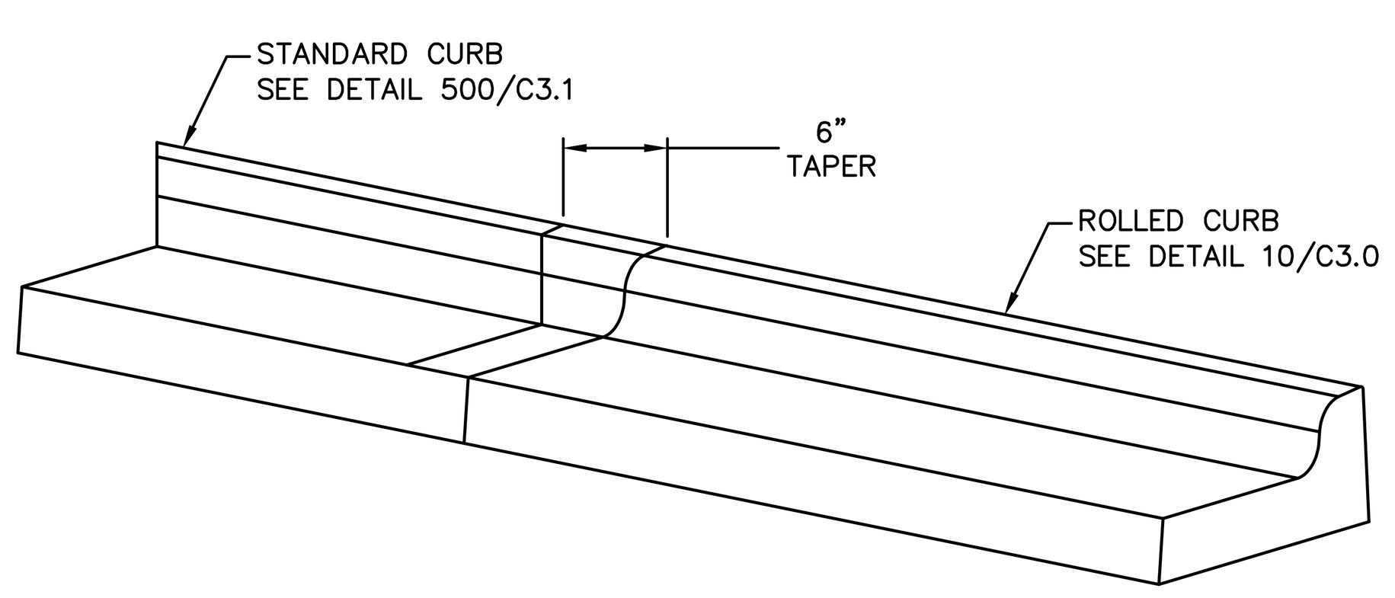


9 TYPICAL PIPE BEDDING AND BACKFILL
SCALE: NTS

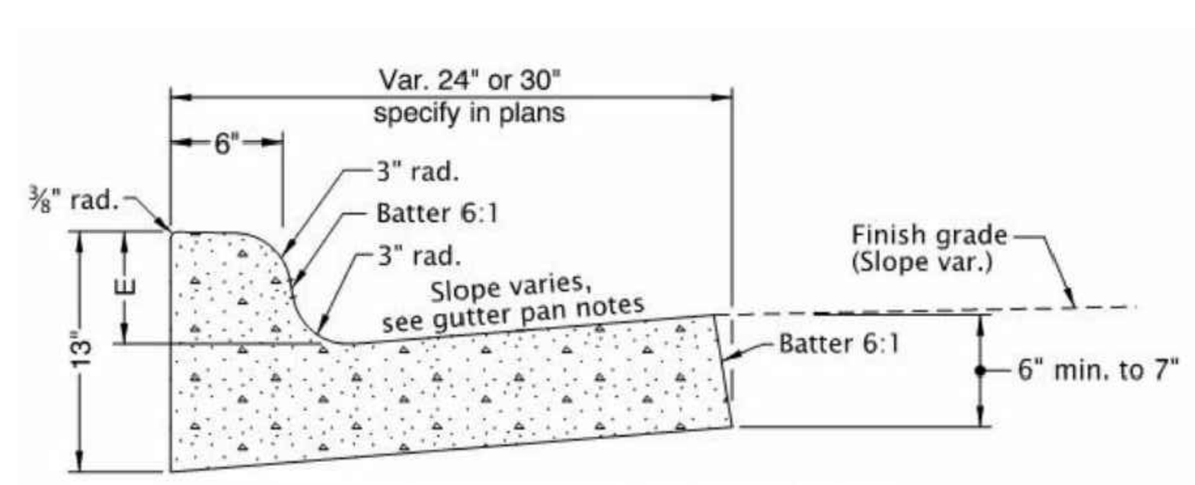


NOTES:
1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C-478.
2. INVERT SHALL BE LEVEL AND SMOOTH.

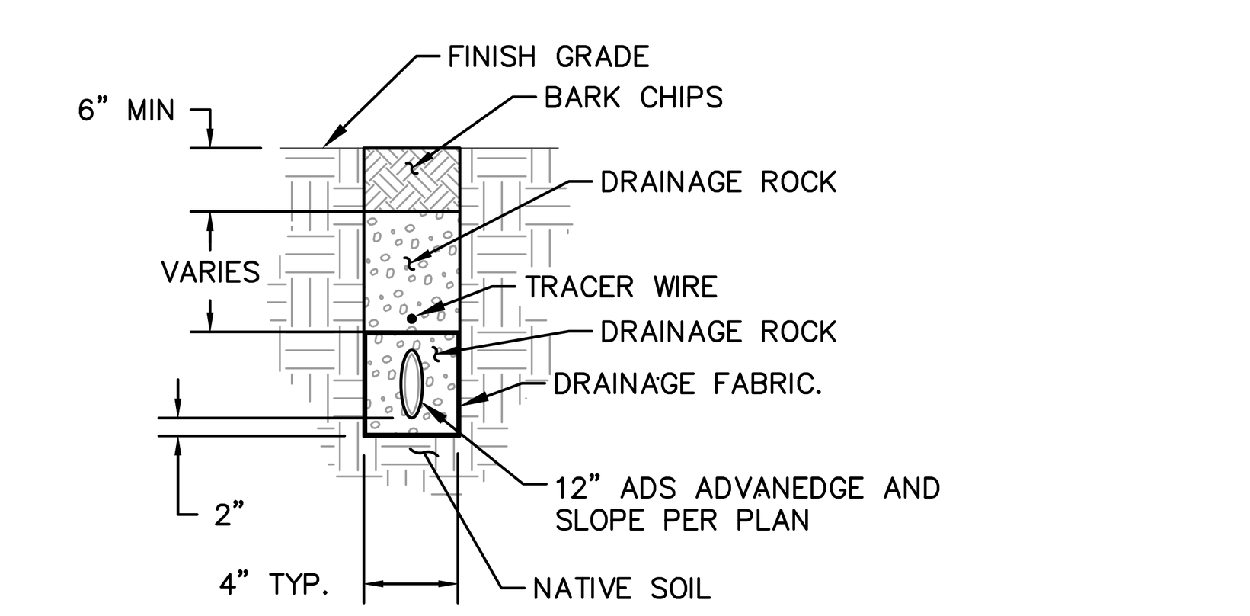
7 DRY WELL
SCALE: NTS



14 ROLLED TO STANDARD CURB TRANSITION
SCALE: NTS

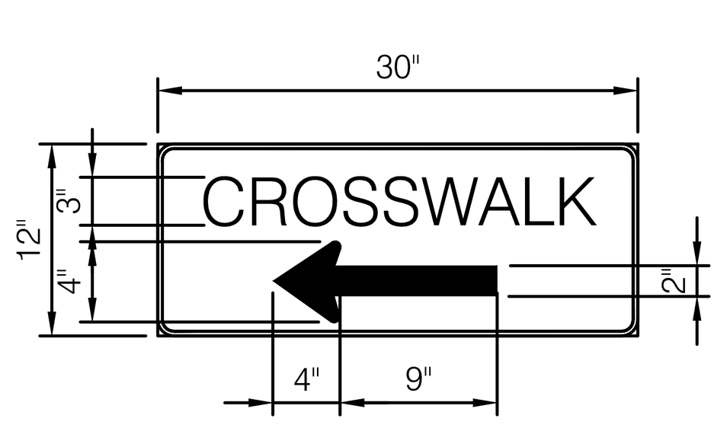


10 ROLLED CURB
SCALE: NTS

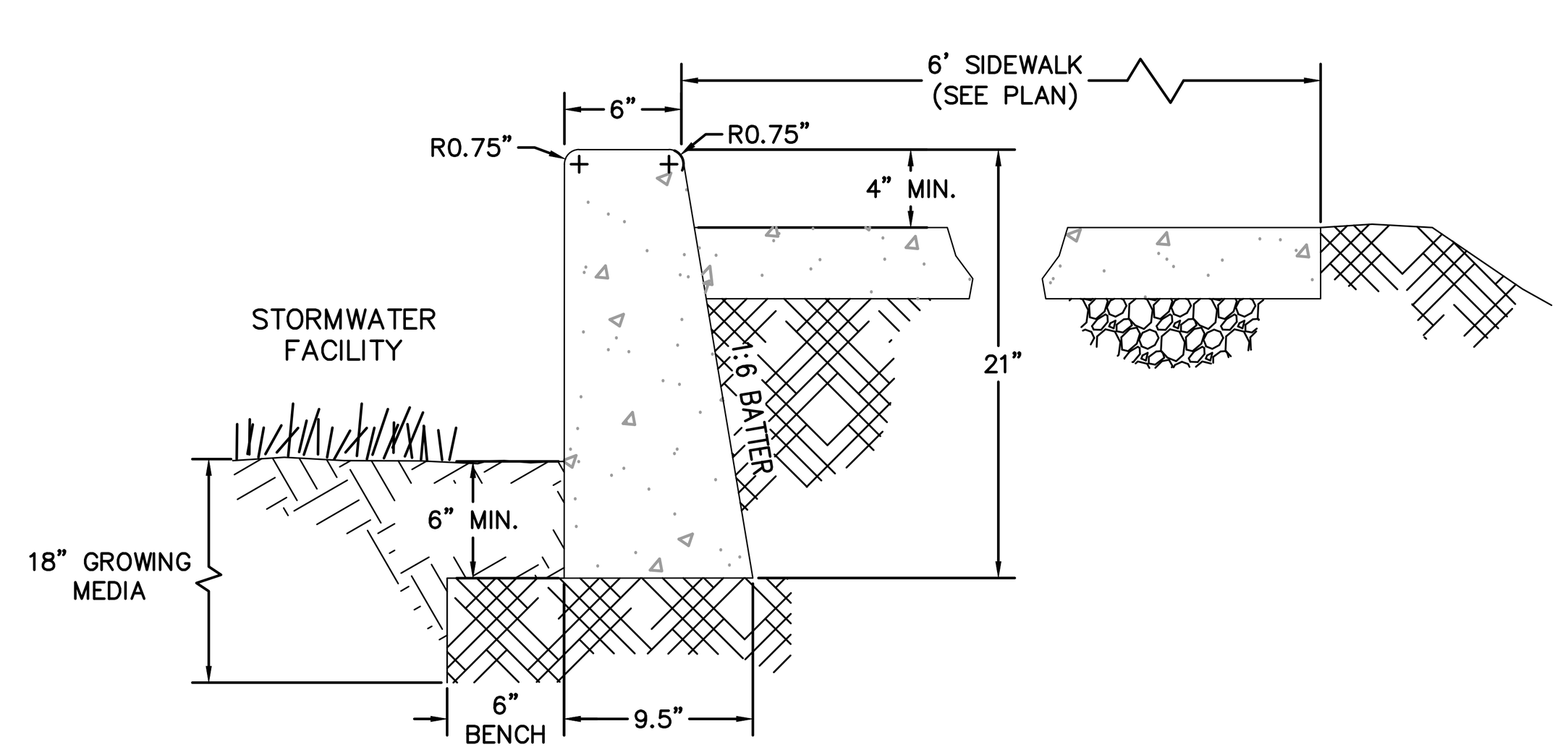


NOTE:
1. CROSS CONNECT DRAIN PIPE TRACER WIRE TO FORM SINGLE CIRCUIT.
2. DRAINAGE FABRIC SHALL BE INSTALLED TO WRAP BACKFILL AREA INDICATED WITH 6" OF OVERLAP AT SEAMS.
3. SLOPE SUBGRADE TO DIRECT RUNOFF TOWARDS THE PERF PIPE.

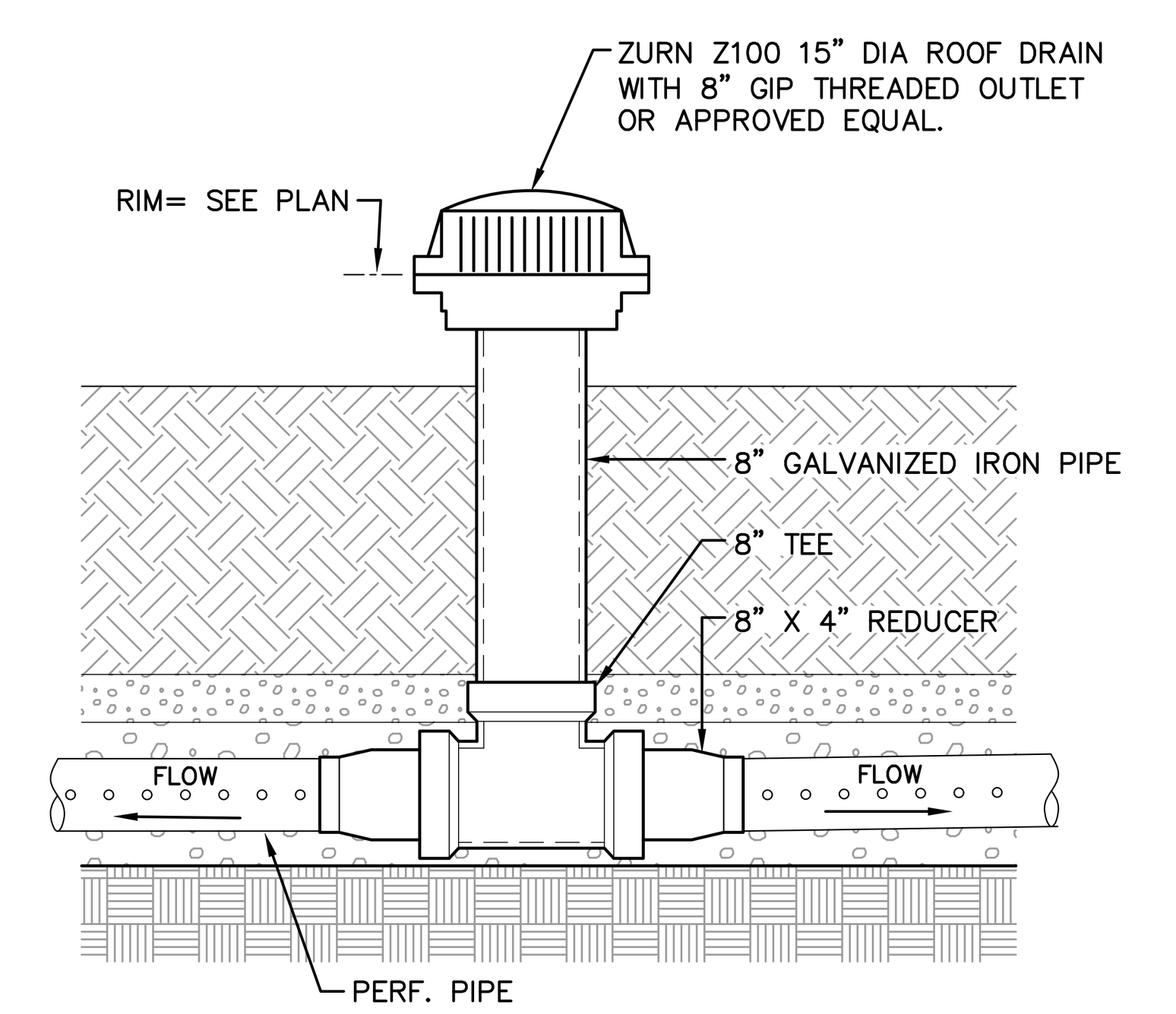
3 PERFORATED DRAIN PIPE
SCALE: NTS



15 CROSSWALK SIGN
SCALE: NTS



11 PLANTER WALL DETAIL
SCALE: NTS



4 OVERFLOW RISER
SCALE: NTS

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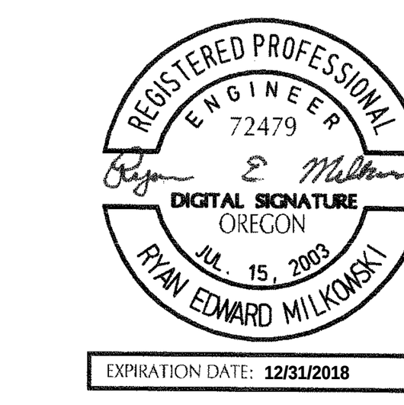

WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

CIVIL DETAILS

REVISIONS

SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET
C3.0

File: \\Civil\Projects\...\1700168-Wichita-Park\CAD\PLOT\4109-DT.dwg TAB:C3.0
Plotted: 3/1/18 at 3:26pm By: SLam
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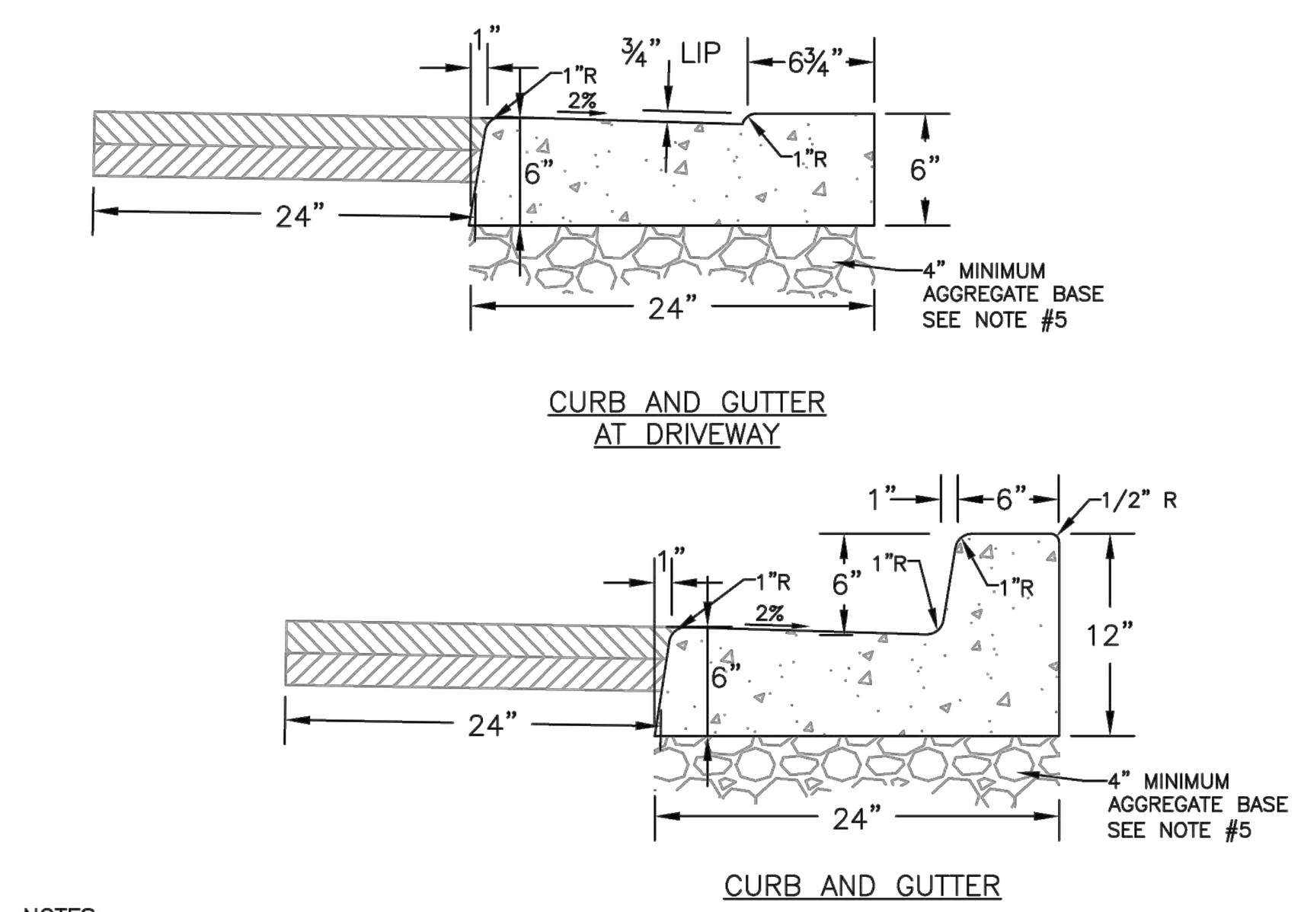


NOTES:

1. CONCRETE SHALL HAVE BREAKING STRENGTH OF 3300 PSI AFTER 28 DAYS.
2. NO EXPANSION MATERIAL SHALL BE USED.
3. TRANSVERSE CONTRACTION JOINTS REQUIRED AT EACH POINT OF TANGENCY AND EVERY 15 FEET. THE DEPTH OF JOINT SHALL BE MIN. OF 1/3 CONCRETE THICKNESS.
4. DRAINAGE BLOCK – 3" DIA. ABS PIPE. TROWEL JOINT OVER PIPE AREA IN DIRECTION OF PIPE.
5. BASE ROCK – 3/4" MINUS OR 1" MINUS COMPACTED TO 95%. MIN. DEPTH OF 4" OR TO STREET SUBGRADE, WHICHEVER IS GREATER.
6. EXISTING ASPHALT CONCRETE IN FRONT OF GUTTER INSTALLATION SHALL BE SAW CUT ALONG A LINE PARALLEL TO THE CURB AT A MINIMUM DISTANCE OF 24" AWAY FROM THE FACE OF THE CURB AND REPLACED WITH HOT MIX ASPHALT CONCRETE WITH MINIMUM THICKNESS OF 4" OR MATCH EXISTING, WHICHEVER IS GREATER.

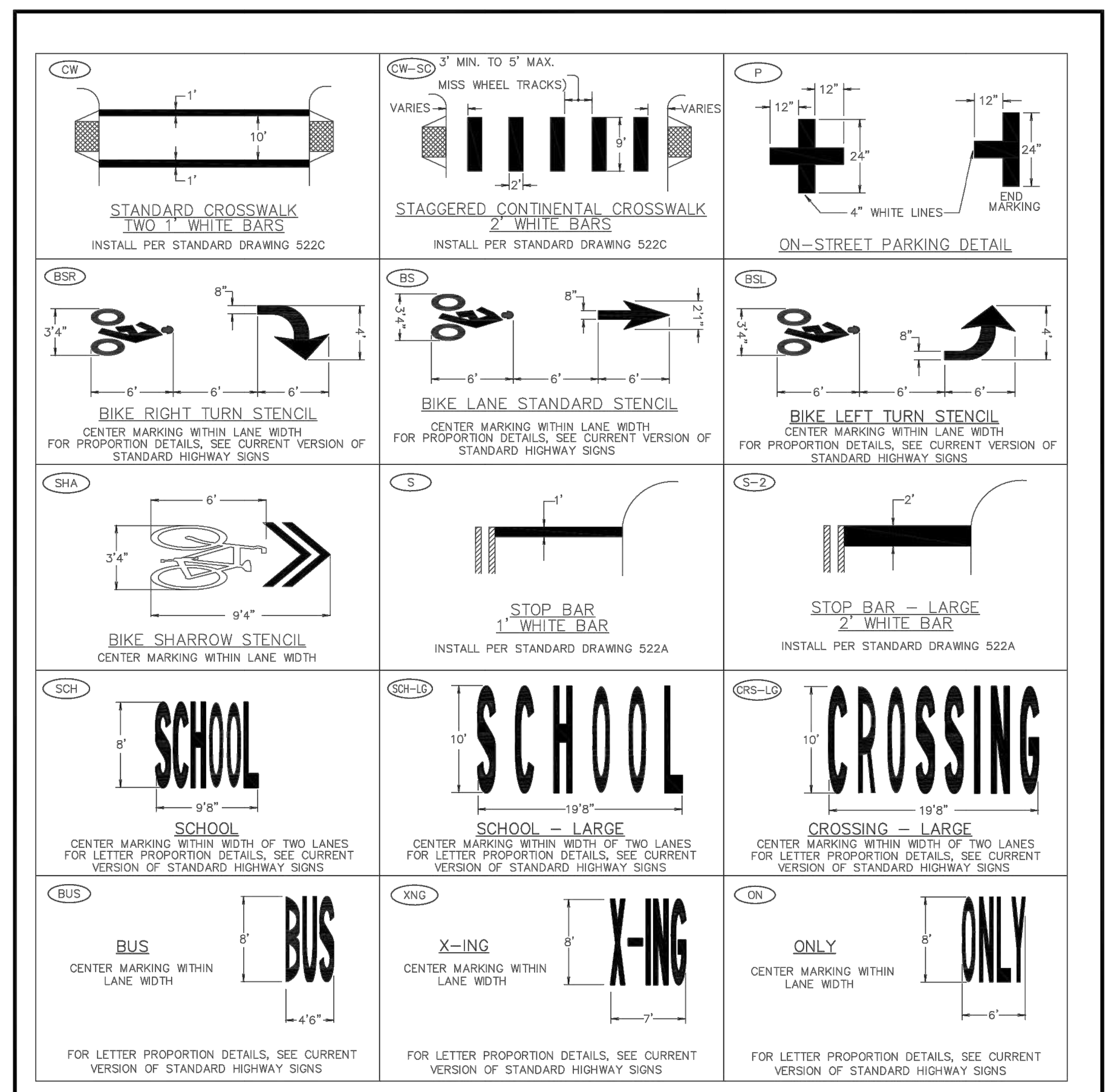
ATTENTION: ALL CONCRETE WORK WITHIN THE PUBLIC RIGHT–OF–WAY REQUIRES A RIGHT–OF–WAY PERMIT IN ADDITION TO SUB–GRADE, BASE ROCK, AND CONCRETE FORM INSPECTION AND APPROVAL BY THE CITY INSPECTOR PRIOR TO POURING CONCRETE. CALL 503–786–7575, 24 HOURS IN ADVANCE OF WORK TO SCHEDULE AN INSPECTION.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Standard Curb and Gutter — DRAWING NO. 500

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
3	ADDED CURB AND GUTTER AT DRIVEWAY	12/11	MCP
4	REVISED DIMENSIONS	12/12	MTC
5	ADDED ASPHALT NOTE	1/15	AJR



NOTES:

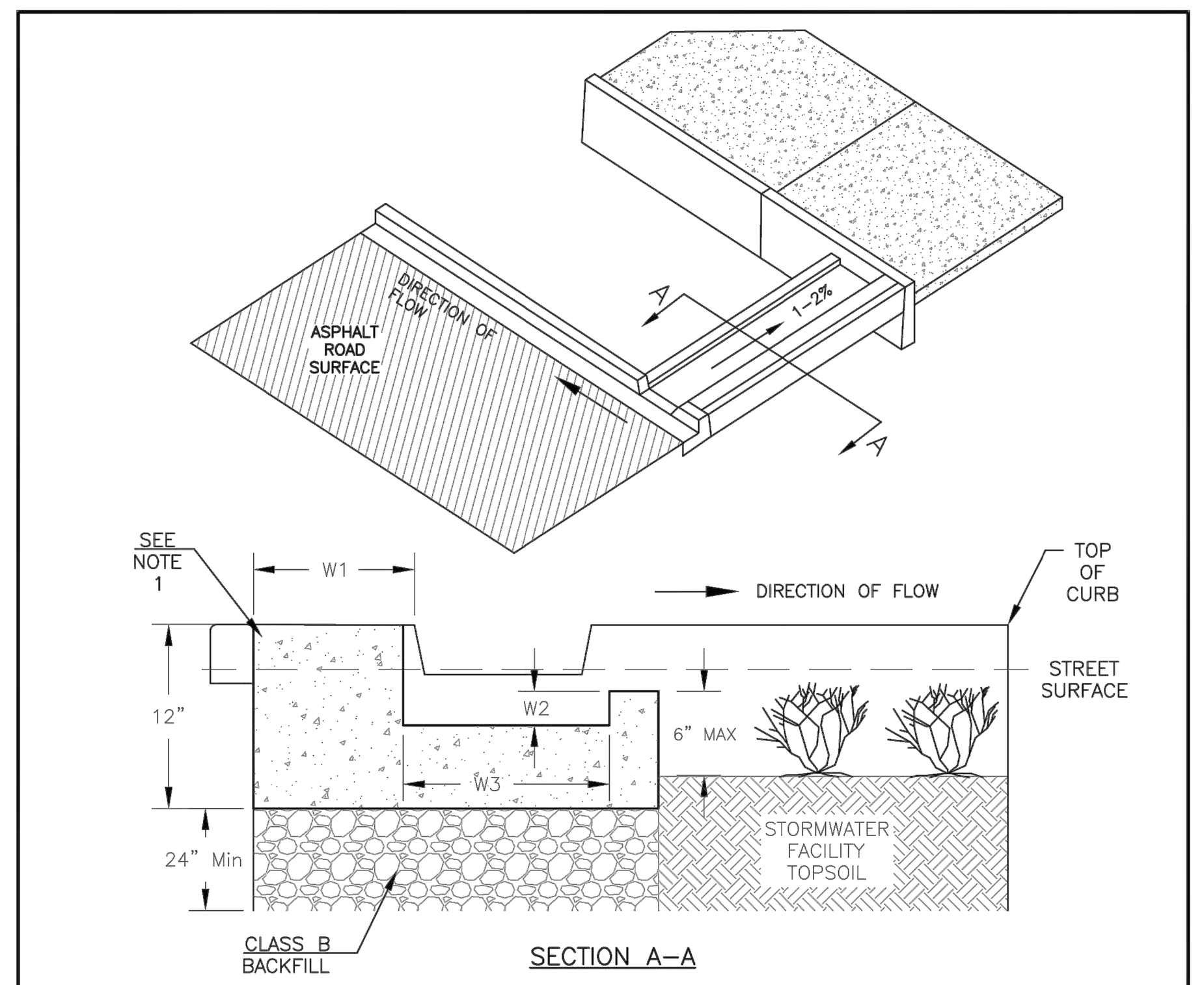
1. ARROW, LETTER, AND BIKE SYMBOL DIMENSIONS NOMINAL.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Pavement Marking Standard Detail Blocks — DRAWING NO. 520

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	DRAWING CREATED	10/12	MTC



NOTES:

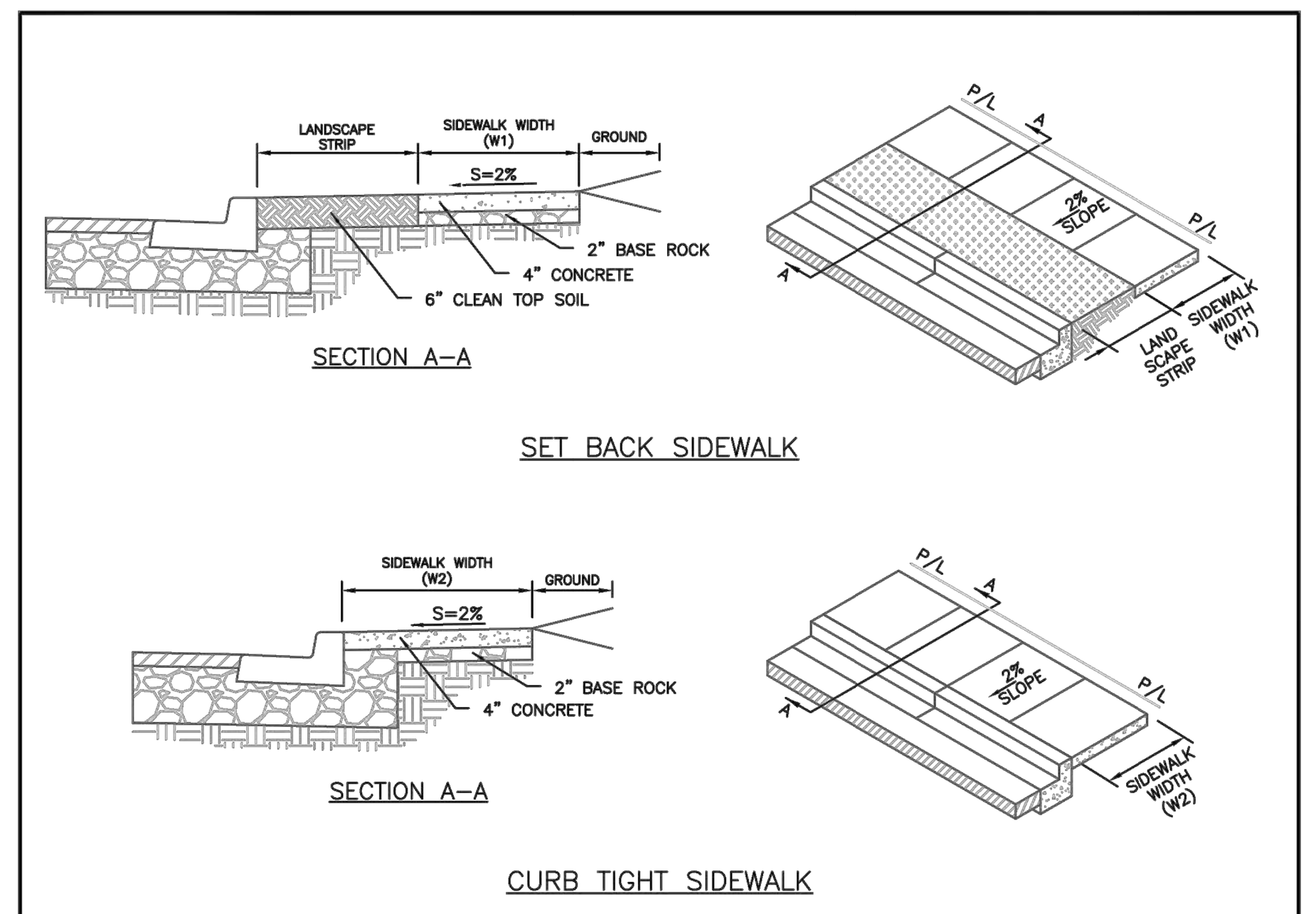
1. CONCRETE SHALL BE 3300 PSI AT 28 DAYS WITH A SLUMP RANGE OF 2" TO 4".
2. DIMENSION (W1) IS DISTANCE BETWEEN START OF THE PLANTER AND THE CURB OPENING. IF VALUE IS 3 FEET OR GREATER, THEN FOREBAY WILL NOT BE CONNECTED TO THE UPSTREAM END OF THE PLANTER.
3. DIMENSIONS (W3) WILL BE 6" WIDER THAN THE WIDTH OF THE CURB OPENING.
4. W2 WILL BE 2" ON ROADS WITH DEVELOPED CURBLINE, AND 4" ON ROADS WITH UNDEVELOPED ROAD SHOULDER.
5. IN RETROFIT APPLICATIONS FOREBAY WILL BE ATTACHED TO RAIN GARDEN WALLS WITH EPOXY SECURED #4 REBAR.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

SEDIMENTATION FOREBAY — DRAWING NO. 625

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	NEW DRAWING	12/14	AJR



NOTES:

1. CONTRACTION JOINTS SHALL BE 1/8" TO 1/4" WIDE WITH A MAXIMUM SPACING OF EVERY 15 FEET. DEPTH OF THE JOINT SHALL BE A MINIMUM OF 1/3 THE THICKNESS OF THE CONCRETE.
2. ALL SURFACES SHALL BE LIGHTLY BROOMED. ALL EDGES SHALL BE TOOL ROUNDED AND SHINED 3" AFTER BROOMING.
3. SAW CUT EXISTING SIDEWALK THAT IS TO BE REMOVED TO THE NEAREST JOINT.
4. CONCRETE SHALL BE 3300 PSI AT 28 DAYS WITH A SLUMP RANGE OF 2" TO 4".
5. PERVIOUS CONCRETE SIDEWALK MAY BE USED AS SPECIFIED IN SPECIAL PROVISIONS OR AS APPROVED BY THE CITY ENGINEER.
6. SIDEWALK PANELS SHOULD BE SQUARE (4'X4', 5'X5', ETC.). IN NO CASE SHALL THE LENGTH OF A SIDEWALK PANEL BE GREATER THAN 1.5 TIMES THE WIDTH AND VICE VERSA.
7. BASE ROCK SHALL BE 3/4"–0 OR 1"–0 CRUSHED AGGREGATE ROCK COMPACTED TO 95% MAXIMUM DENSITY OF AASHTO T–180.
8. CURB JOINT FOR CURB TIGHT SIDEWALK SHALL BE A TROWLED JOINT WITH A 1/2" RADIUS ALONG THE BACK OF CURB.

TABLE 1 – SIDEWALK WIDTH

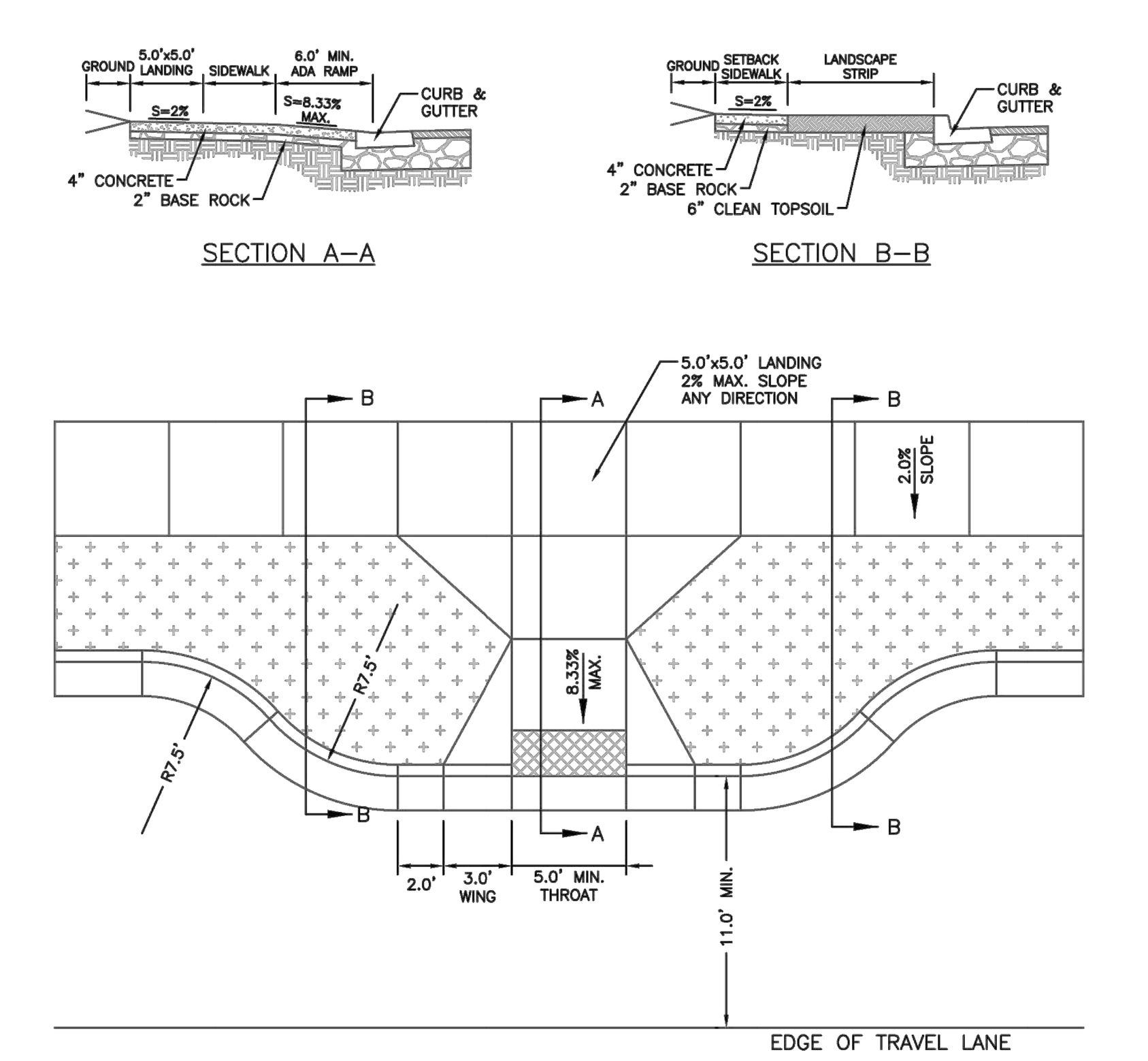
CLASSIFICATION	W1	W2
LOCAL STREET	5.0'	6.0'
NEIGHBORHOOD ROUTE	5.0'	6.0'
COLLECTOR ROAD	6.0'	8.0'
ARTERIAL ROUTE	6.0'	10.0'

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Sidewalk — DRAWING NO. 504

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	DRAWING REVISED	10/09	ZJW
2	DRAWING NUMBER CHANGED	12/10	MCP
3	ADDED PERVIOUS CONCRETE NOTE	12/11	MCP



NOTES

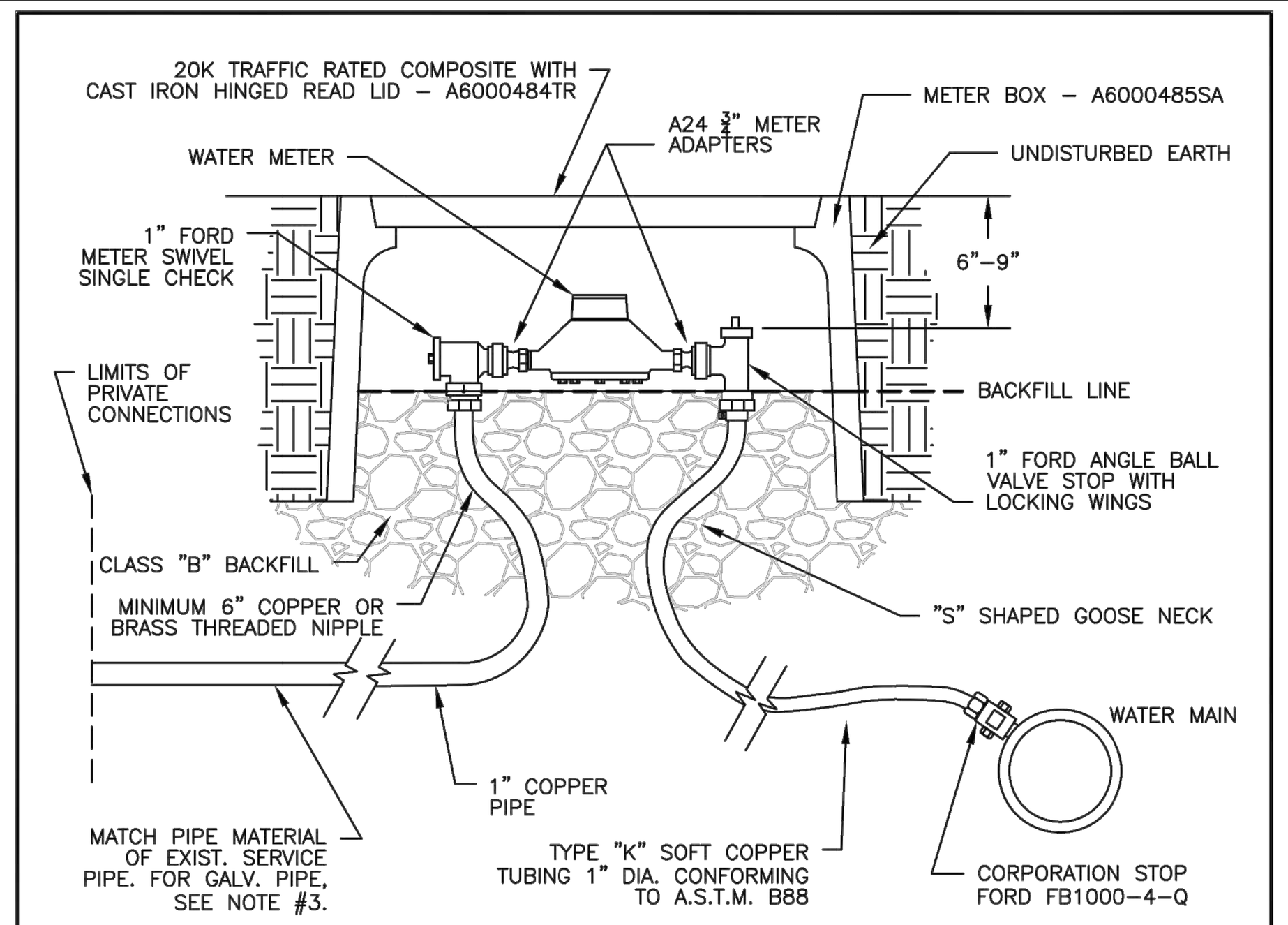
1. SIDEWALK RAMPS SHALL MEET ADA STANDARDS.
2. ALL SURFACES SHALL BE LIGHTLY BROOMED. ALL EDGES SHALL BE TOOL ROUNDED AND SHINED 3" AFTER BROOMING.
3. SAW CUT EXISTING RAMP, CURB, AND SIDEWALK THAT ARE TO BE REMOVED TO THE NEAREST JOINT.
4. CONCRETE SHALL BE 3300 PSI AT 28 DAYS WITH A SLUMP RANGE OF 2" TO 4".
5. SIDEWALK PANELS SHOULD BE SQUARE (4'X4', 5'X5', ETC.). IN NO CASE SHALL THE LENGTH OF A SIDEWALK PANEL BE GREATER THAN 1.5 TIMES THE WIDTH AND VICE VERSA.
6. BASE ROCK SHALL BE 3/4"–0 OR 1"–0 CRUSHED AGGREGATE ROCK COMPACTED TO 95% MAXIMUM DENSITY OF AASHTO T–180.
7. CURB JOINT FOR CURB TIGHT SIDEWALK SHALL BE A TROWLED JOINT WITH A 1/2" RADIUS ALONG THE BACK OF CURB.
8. LANDINGS SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 20:1 IN ANY DIRECTION AND HAVE MINIMUM DIMENSIONS OF 5' X 5'.
9. DETECTABLE WARNING PAD SHALL BE 24" LONG IN THE DIRECTION OF TRAVEL AND INSTALLED ALONG THE FULL WIDTH OF THE BOTTOM OF THE SIDEWALK RAMP. MASCO CAST–IN–TACT (BLACK) OR APPROVED EQUAL.
10. SETBACK SIDEWALK RAMPS: THE MAXIMUM SLOPE SHALL FIRST BE PROVIDED IN THE RAMP ADJACENT TO THE STREET. ANY ADDITIONAL ELEVATION GAIN SHALL BE PROVIDED IN THE SIDEWALK RAMP SLOPES.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

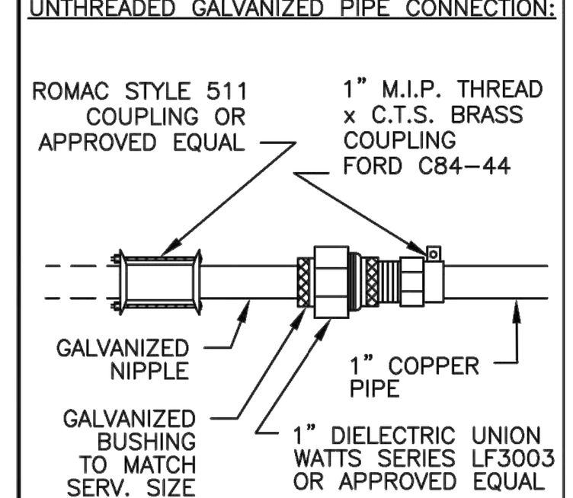
Mid–Block Curb Extension — DRAWING NO. 508

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	NEW DRAWING	10/09	ZJW
2	DRAWING NUMBER CHANGED	12/10	MCP



UNTHREADED GALVANIZED PIPE CONNECTION:



NOTES:

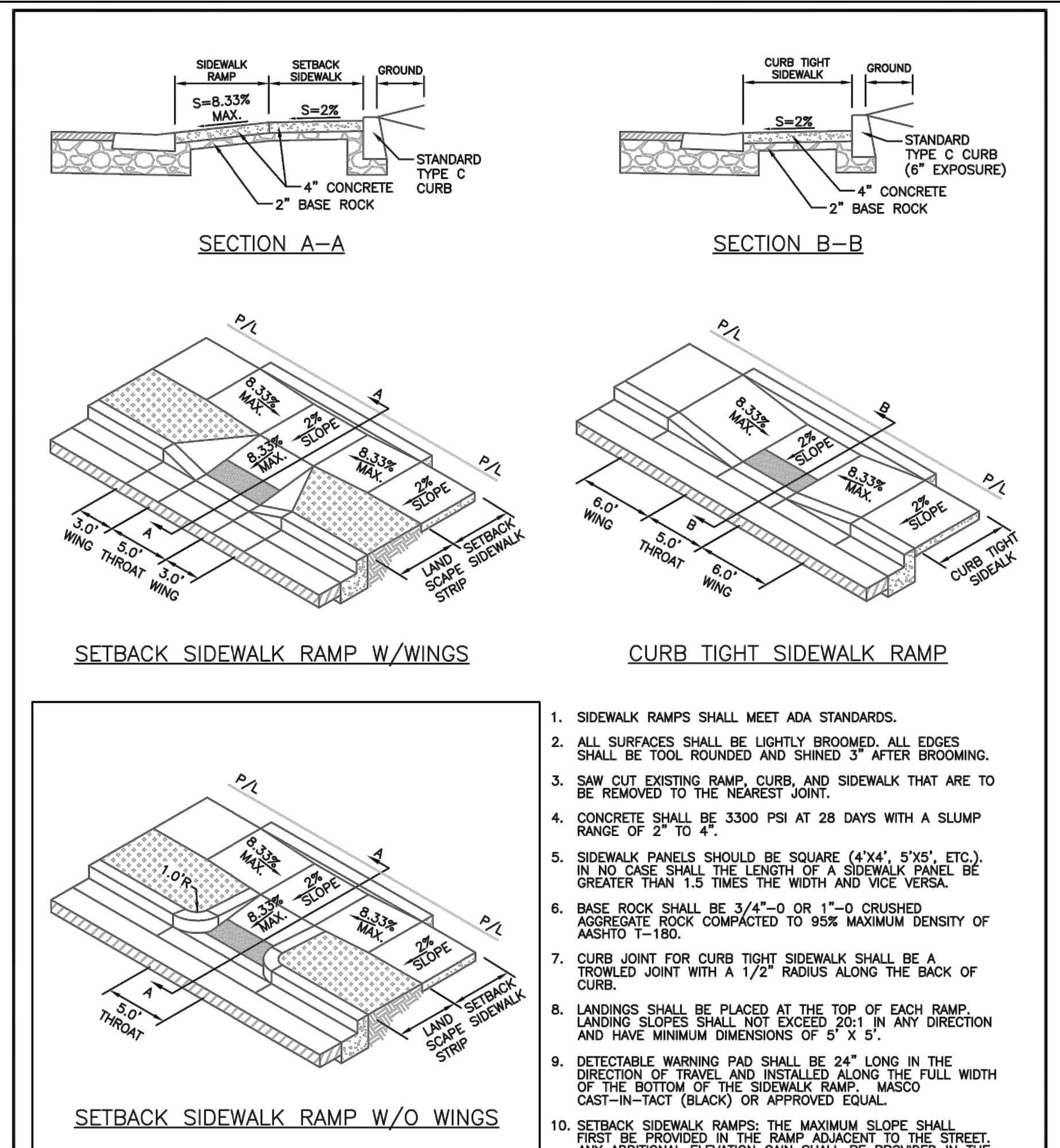
1. IF COPPER TUBING CROSSES CATHODICALLY PROTECTED LINE, ENCASE COPPER IN POLYETHYLENE TUBING FOR 24" (CENTERED AT THE CROSSING LINE) AND FASTEN WITH 2" WIDE ADHESIVE TAPE THAT IS COMPATIBLE WITH POLYETHYLENE.
2. PLACE METER BOXES (1) LOCATED BEHIND THE SIDEWALK WHERE THERE IS SUFFICIENT RIGHT–OF–WAY, (2) WITHIN THE PLANTER STRIP, EXCLUDING WATER QUALITY FACILITIES, (3) WITHIN THE SIDEWALK WITH THE BACK OF THE METER BOX AT THE BACK EDGE OF THE SIDEWALK.
3. CONNECT GALVANIZED SERVICE PIPE; (1) AT EXISTING THREADED FITTING WITHIN 5 FEET OF WATER METER; (2) RETHREAD EXISTING GALVANIZED SERVICE PIPE; (3) IF EXISTING PIPE IS IN POOR CONDITION AND CANNOT BE RETHREADED, USE UNTHREADED GALVANIZED PIPE CONNECTION DETAIL.
4. IF METER BOX IS LOCATED IN THE SIDEWALK, DIELECTRIC UNION WILL BE INSTALLED (1) 6" FROM BACK OF METER INSIDE OF METER BOX, (2) BEHIND BACK OF SIDEWALK.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Standard 1 Inch Water Service — DRAWING NO. 401

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
3	DRAWING REVISED	12/12	MCP
4	REMOVED COPPERSETTER	11/13	AJR
5	ADDED DIELECTRIC UNION NOTE	12/14	AJR



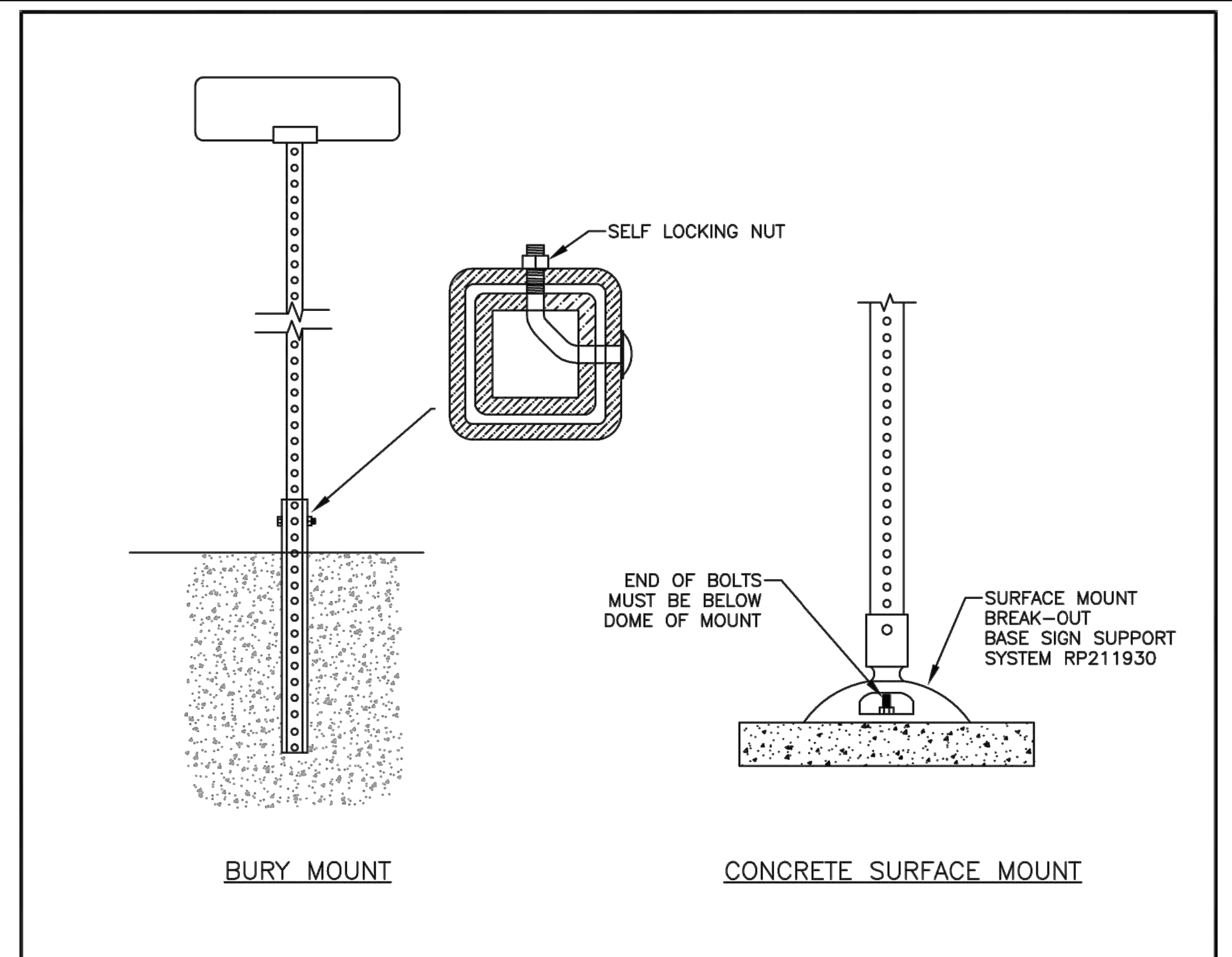
1. SIDEWALK RAMPS SHALL MEET ADA STANDARDS.
2. ALL SURFACES SHALL BE LIGHTLY BROOMED. ALL EDGES SHALL BE TOOL ROUNDED AND SHINED 3" AFTER BROOMING.
3. SAW CUT EXISTING RAMP, CURB, AND SIDEWALK THAT ARE TO BE REMOVED TO THE NEAREST JOINT.
4. CONCRETE SHALL BE 3300 PSI AT 28 DAYS WITH A SLUMP RANGE OF 2" TO 4".
5. SIDEWALK PANELS SHOULD BE SQUARE (4'X4', 5'X5', ETC.). IN NO CASE SHALL THE LENGTH OF A SIDEWALK PANEL BE GREATER THAN 1.5 TIMES THE WIDTH AND VICE VERSA.
6. BASE ROCK SHALL BE 3/4"–0 OR 1"–0 CRUSHED AGGREGATE ROCK COMPACTED TO 95% MAXIMUM DENSITY OF AASHTO T–180.
7. CURB JOINT FOR CURB TIGHT SIDEWALK SHALL BE A TROWLED JOINT WITH A 1/2" RADIUS ALONG THE BACK OF CURB.
8. LANDINGS SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 20:1 IN ANY DIRECTION AND HAVE MINIMUM DIMENSIONS OF 5' X 5'.
9. DETECTABLE WARNING PAD SHALL BE 24" LONG IN THE DIRECTION OF TRAVEL AND INSTALLED ALONG THE FULL WIDTH OF THE BOTTOM OF THE SIDEWALK RAMP. MASCO CAST–IN–TACT (BLACK) OR APPROVED EQUAL.
10. SETBACK SIDEWALK RAMPS: THE MAXIMUM SLOPE SHALL FIRST BE PROVIDED IN THE RAMP ADJACENT TO THE STREET. ANY ADDITIONAL ELEVATION GAIN SHALL BE PROVIDED IN THE SIDEWALK RAMP SLOPES.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Mid–Block Sidewalk Ramps — DRAWING NO. 505

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	NEW DRAWING	10/09	ZJW
2	DRAWING NUMBER CHANGED	12/10	MCP



NOTES:

1. SIGN COMBINATION AND MINIMUM SIGN MOUNTING HEIGHT SHALL DETERMINE POST LENGTH. A 10' (MIN.) POST SHALL BE USED. A COMBINATION OF SIGNS GREATER THAN 36" IN HEIGHT SHALL REQUIRE A 12' (MIN.) POST.
2. SIGN POST SIZING SHALL BE BASED ON OREGON STANDARD DRAWING TM682 (85 MPH SQUARE TUBE SIGN SUPPORT SIZING CHART). THE MINIMUM POST SIZE SHALL BE 2" X 2" 12 GA. SQUARE TUBE. IF THE SIGN PANEL AREA IS GREATER THAN THAT ALLOWED BY A 2" X 2" POST, THEN A 2 ½" X 2 ½" 12 GA. POST SHALL BE USED. IF A LARGER SUPPORT IS REQUIRED, THEN WOOD SIGN SUPPORTS SHALL BE USED AS PER OREGON STANDARD DRAWING TM670.
3. NYLON SPACERS SHALL BE USED TO PREVENT CONTACT BETWEEN GLAVANIZED STEEL AND ALUMINUM MATERIAL SURFACES.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Steel Street Sign Mounting — DRAWING NO. 525

APPROVED 12/14 — CITY ENGINEER / DATE

NO.	REVISIONS	DATE	BY
1	NEW DRAWING	12/14	AJR

kpff

REGISTERED PROFESSIONAL ENGINEER 72479 OREGON — RYAN EDWARD MILKOWSKI — DIGITAL SIGNATURE — EXPIRATION DATE: 12/31/2018

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

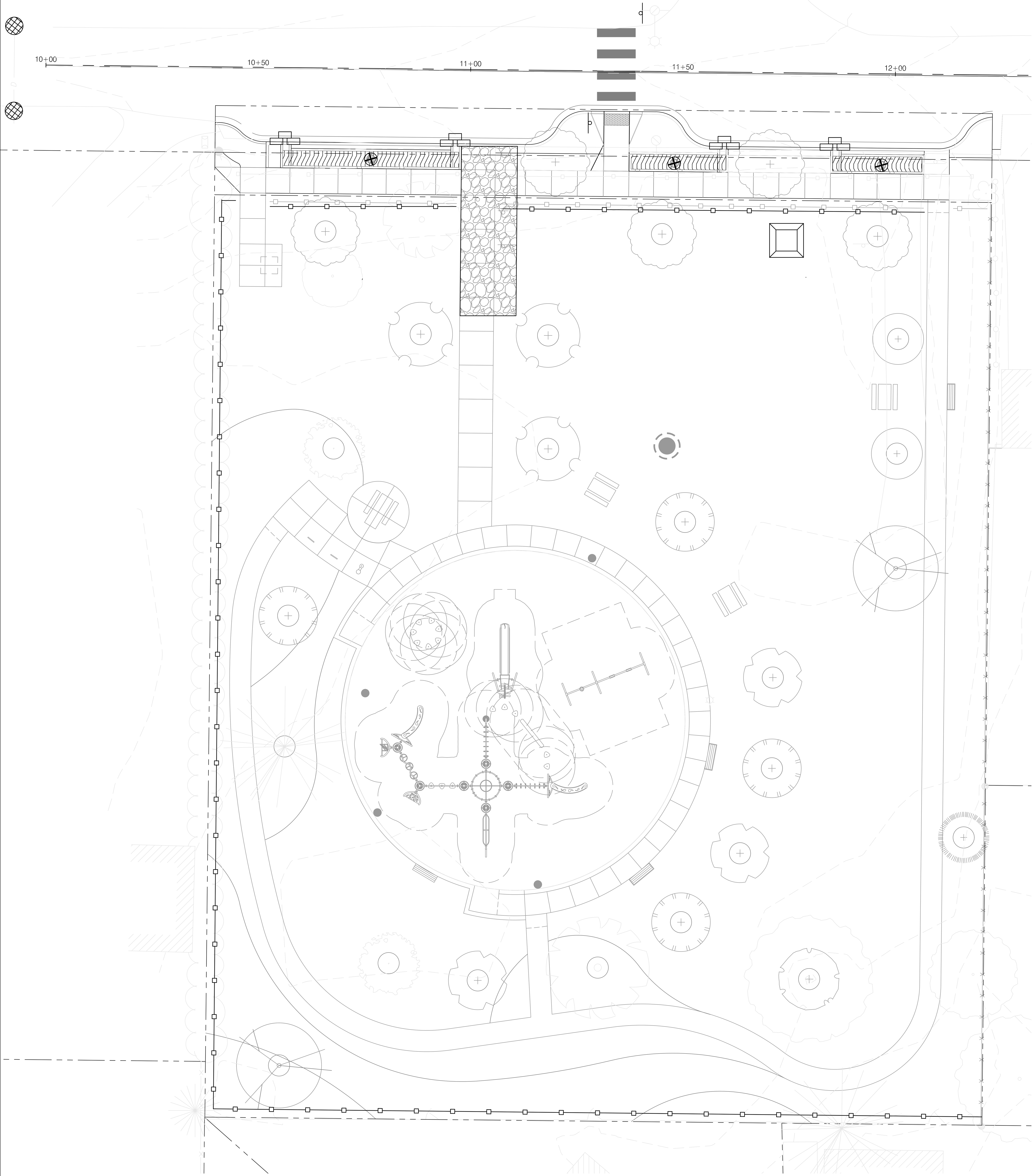
STANDARD DETAILS

REVISIONS

SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET

C3.1



EROSION CONTROL PLAN NOTES

1. APPROVAL OF THIS EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).
2. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND PERMANENT VEGETATION/LANDSCAPING IS ESTABLISHED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
7. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
8. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
9. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

CONSTRUCTION SEQUENCING & STORM FACILITY NOTES

1. THE STORMWATER VEGETATED INFILTRATION BASINS ARE PERMANENT STORMWATER FACILITIES AND MUST BE PROTECTED FROM SILTATION AND SCOURING DURING THE CONSTRUCTION PHASE. DURING CONSTRUCTION, STORMWATER MAY BE ROUTED TO THE STORMWATER FACILITIES PROVIDED EROSION CONTROL MEASURES LISTED BELOW ARE IMPLEMENTED:

- INSTALL PROTECTIVE JUTE MATTING OR FILTER FABRIC OVER BOTTOM AND SIDE SLOPES OF FACILITY.
- OVERFLOW INLETS WITHIN THE FACILITY MUST RECEIVE INLET PROTECTION PER DETAIL 1/C4.1.
- PRIOR TO PLANTING, THE PROTECTIVE MATTING SHOULD BE REMOVED AND THE TOP 6" OF GROWING MEDIUM SHALL BE TILLED TO CONFIRM SOIL MIX MEETS DESIGN GRADATIONS AND SOIL DRAINS AS DESIGNED PRIOR TO PLANTING.
- ATTENTION!!!: RAIN EVENTS THAT SCOUR EXPOSED SOIL REQUIRE ADDITIONAL TILLING OR POTENTIALLY REPLACEMENT PRIOR TO PLACEMENT OF PLANTING TO ENSURE STORM FACILITY FUNCTIONS DRAINS AS DESIGNED.

SHEET LEGEND

Item	Detail
PROPERTY LINE	
EX. CONTOUR	
PROP. CONTOUR MINOR (49)	
PROP. CONTOUR MAJOR (50)	
SEDIMENT FENCE. PLACE AT PROPERTY LINE. (SHOWN OFFSET FOR CLARITY).	4/C4.1
INLET PROTECTION	1/C4.1
OVERFLOW PROTECTION	1/C4.1
CONSTRUCTION ENTRANCE	2/C4.1
CONCRETE WASH OUT AREA	3/C4.1
BIOFILTER BAG AT CURB SPILLWAY	5/C4.1
PROPOSED DRYWELL	

SCALE 1 INCH = 10 FEET
10 0 10 20

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REGISTERED PROFESSIONAL ENGINEER 72479
DIGITAL SIGNATURE
OREGON
JUL. 15, 2003
RYAN EDWARD MILKOWSKI
EXPIRATION DATE: 12/31/2018

WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

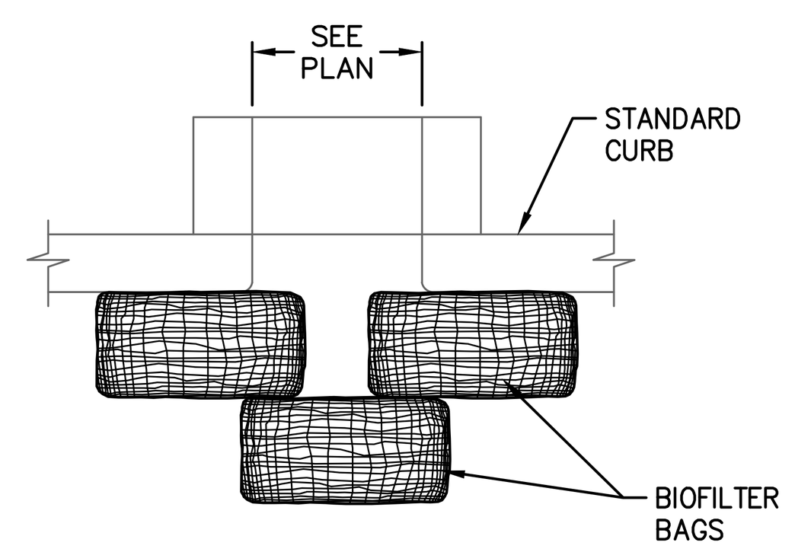
BID SET

EROSION CONTROL PLAN

REVISIONS

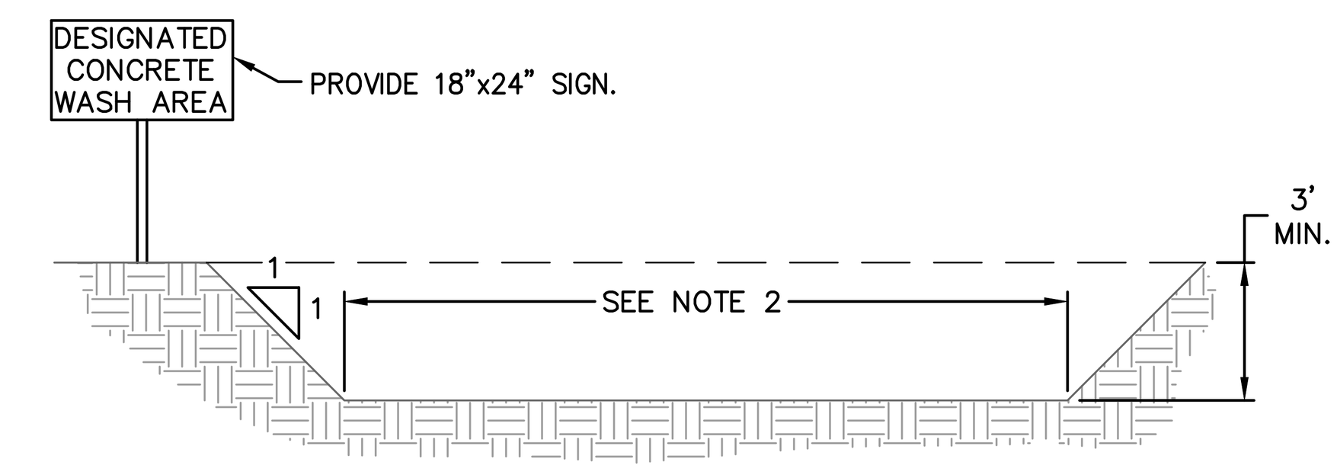
SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET
C4.0



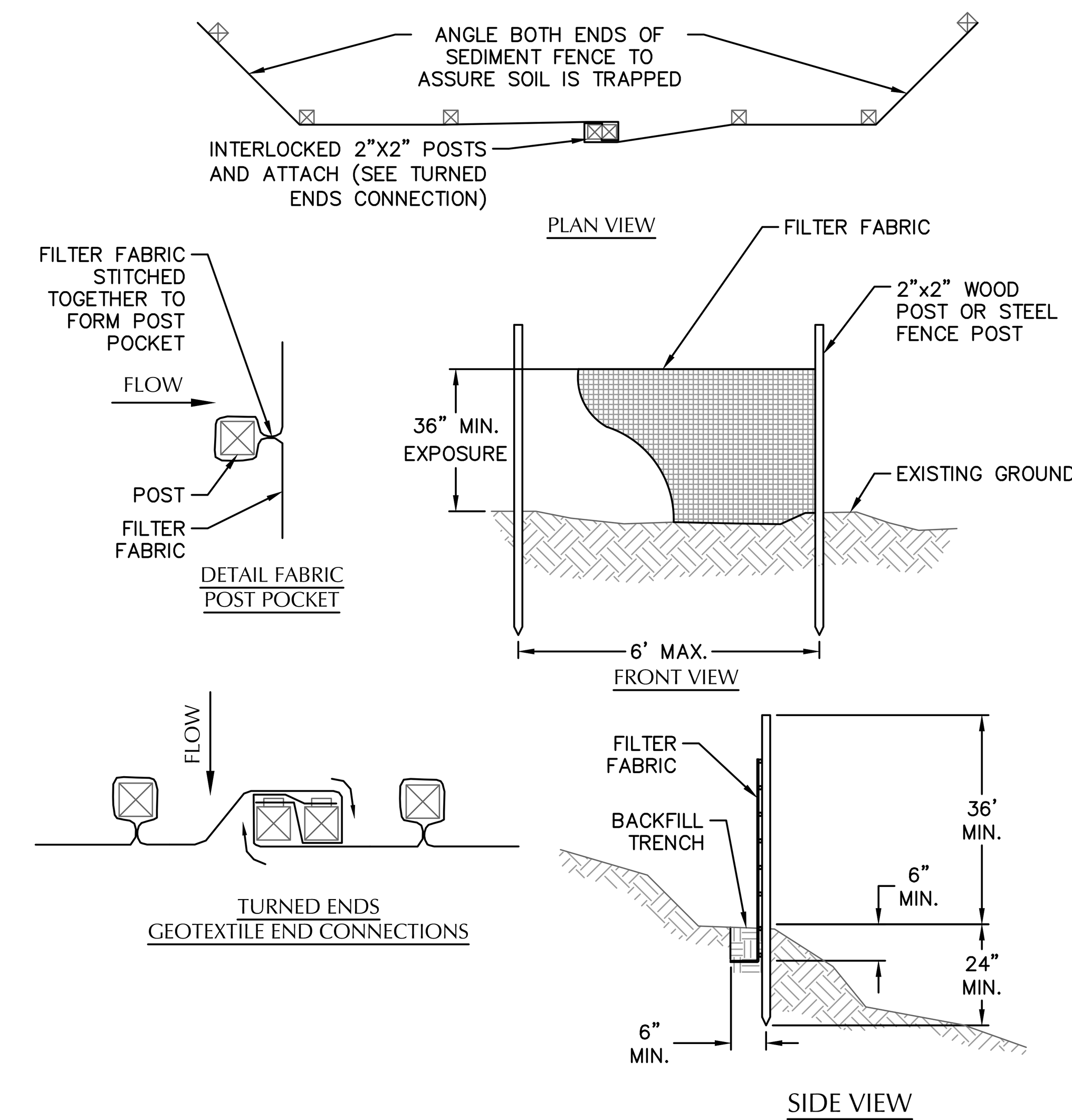
NOTES:
PLACE BIOFILTER BAG FLUSH AGAINST CURB IN GUTTER

5 BIOFILTER BAG AT CURB SPILLWAY
SCALE: NTS



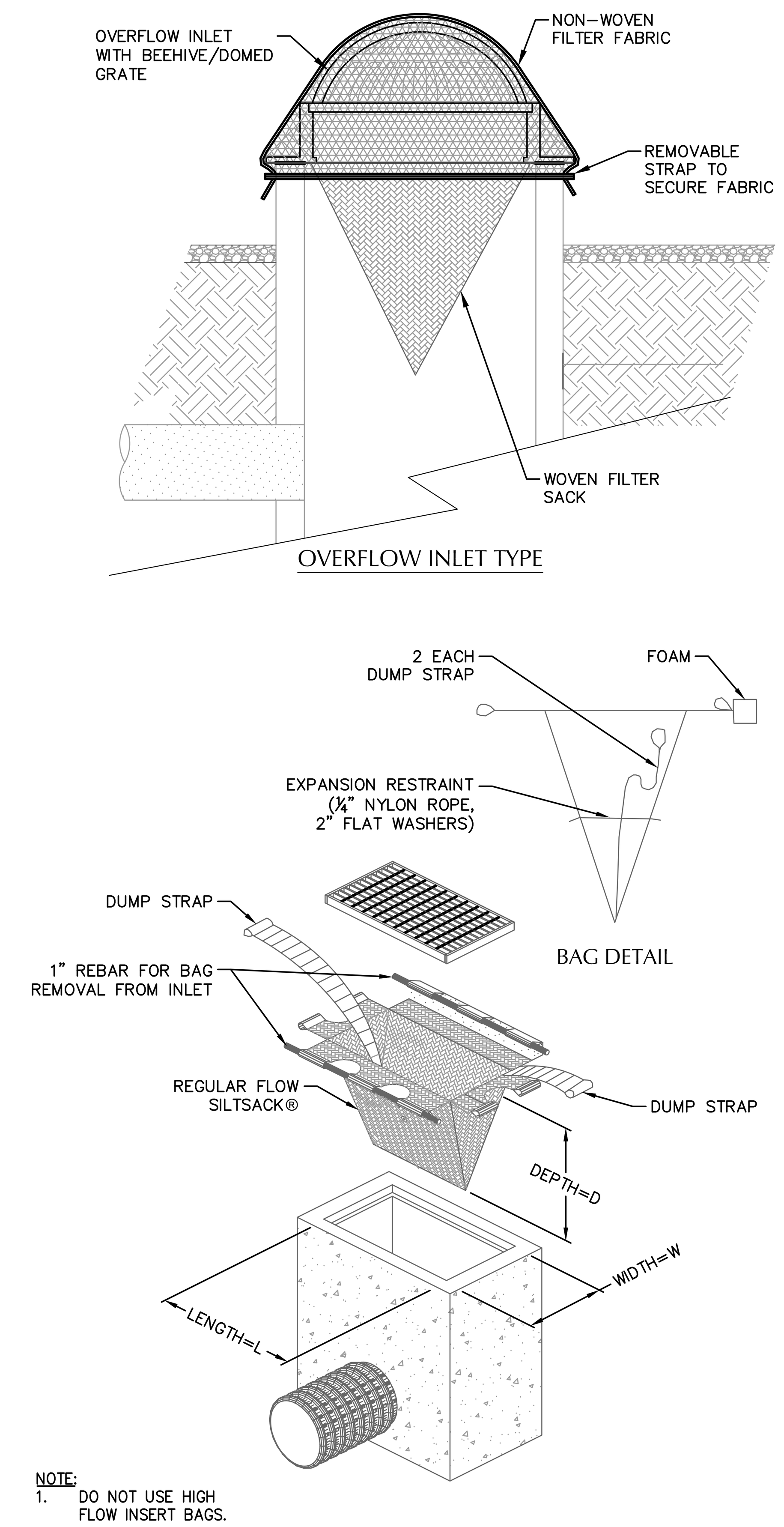
NOTES:
1. INSTALL A CONCRETE WASH OUT PIT AND A VISIBLE SIGN STATING, "DESIGNATED CONCRETE WASH AREA." LOCATE THE WASH OUT IN A PLACE THAT WILL BE ACCESSIBLE TO CONCRETE TRUCKS SIZE TO THE PROJECT.
2. PROVIDE 3' X 3' MINIMUM WASHOUT AREA. INCREASES SIZE OR PROVIDE ADDITIONAL WASHOUTS AS REQUIRED TO ACCOMMODATE PROJECT CONDITIONS.
3. LOCATE WASHOUTS IN AREAS THAT WILL BE ACCESSIBLE TO CONCRETE TRUCKS.
4. FOR WASHOUTS LOCATED IN AREAS DESIGNATED TO RECEIVE HARDSCAPE, SOLIDS MAY BE BURIED IN PLACE. FOR OTHER APPLICATIONS, REMOVE AND DISPOSE OF SOLIDS.

3 CONCRETE WASHOUT
SCALE: NTS



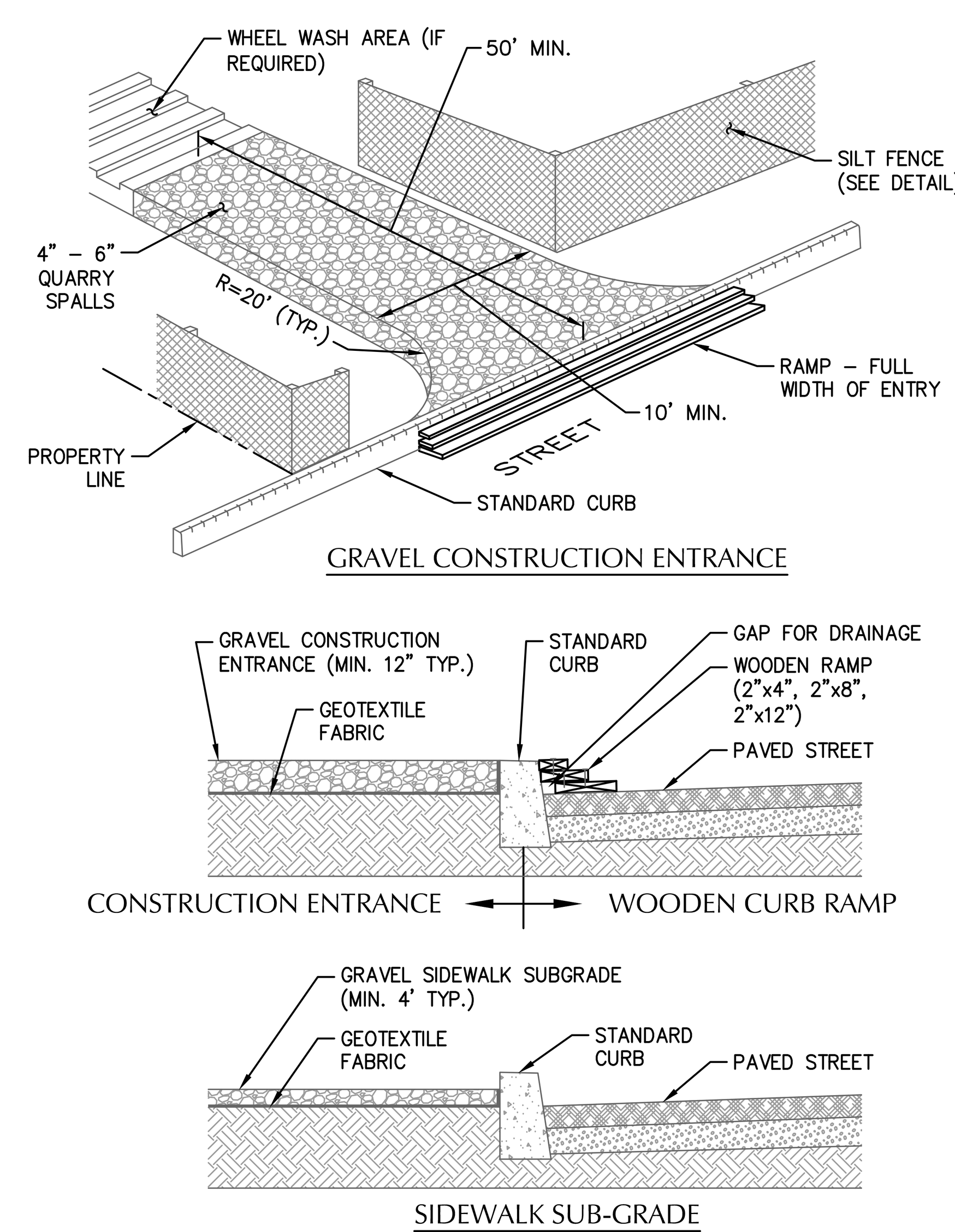
NOTES:
1. THE FILTER FABRIC SHALL BE (36" MIN. WIDTH) PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST, OR OVERLAP 2"x2" POSTS AND ATTACH AS SHOWN ON DETAIL SHEET.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6-FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24-INCHES.
3. THE FILTER FABRIC SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6-INCHES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION, SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY FILTER FABRIC SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2"x2" POST INSTALLATION. STITCHED LOOPS WITH STAKES SHALL BE INSTALLED ON THE DOWN-HILL SIDE OF THE SLOPED AREA.
5. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UP-SLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED.
6. FILTER FABRIC FENCES SHALL BE INSPECTED BY CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

4 SEDIMENT FENCE
SCALE: NTS



NOTE:
1. DO NOT USE HIGH FLOW INSERT BAGS.

1 INLET SEDIMENT PROTECTION
SCALE: NTS



2 STABILIZED CONSTRUCTION ENTRANCE
SCALE: NTS

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WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

EROSION CONTROL DETAILS

REVISIONS

SCALE	AS SHOWN
DRAWN BY	REM
DATE	03/01/18
PROJECT NO.	1434

SHEET
C4.1

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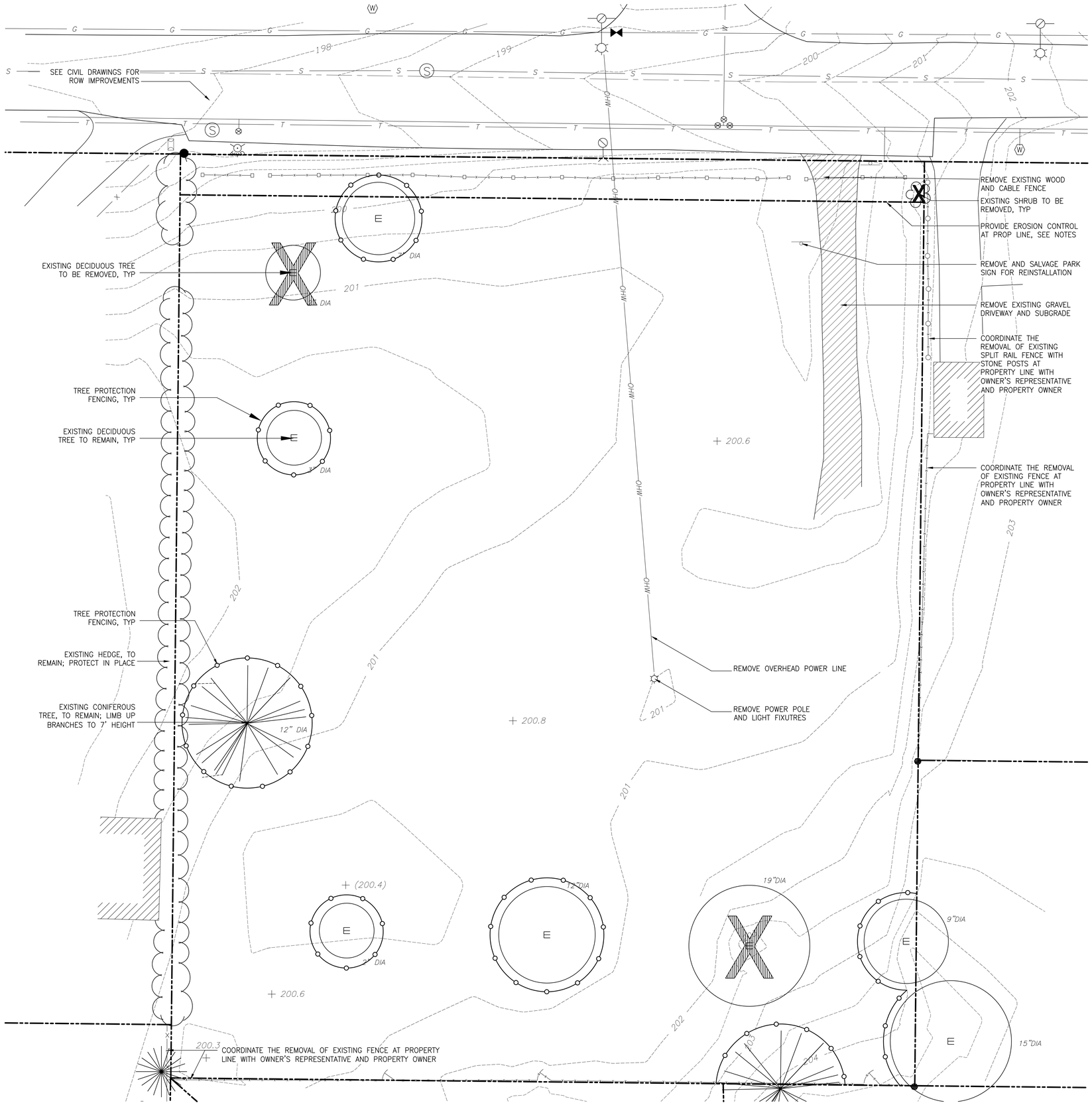


1 TREE PROTECTION + SITE DEMOLITION PLAN

SCALE: 1" = 10'

0 5' 10' 20'

N

DEMOLITION/TREE PROTECTION LEGEND

- PROPERTY LINE
- PAVEMENT REMOVAL
- TREE PROTECTION FENCING
- EXISTING DECIDUOUS TREE, TO BE REMOVED
- EROSION CONTROL FENCING
- 1' CONTOUR
- 0.5' CONTOUR
- GAS LINE
- WATER LINE
- SANITARY SEWER LINE
- TELECOMMUNICATION LINE
- OVERHEAD ELECTRIC
- STORM DRAIN LINE
- MANHOLE
- WATER METER
- WATER VALVE
- GAS VALVE
- CATCH BASIN (W/ INLET PROTECTION)
- FIRE HYDRANT
- LIGHT POLE
- UTILITY POLE WITH LIGHT
- UTILITY POLE WITH GUY ANCHOR
- 3' WIDE HINGED GATE
- SIGN
- MAILBOX
- TREE–EVERGREEN
- TREE–DECIDUOUS

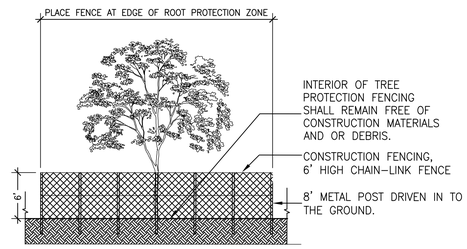
SITE NOTES

1. CONTRACTOR TO PROVIDE SIX FOOT HIGH SECURITY FENCE AROUND THE PERIMETER OF THE SITE FOR THE DURATION OF THE PROJECT.

TREE AND PLANT PROTECTION NOTES

1. PROTECT ALL TREES INDICATED TO REMAIN, INCLUDING BARK AND ROOT ZONES. INSTALL PROTECTIVE FENCING WHERE INDICATED ON THE TREE PROTECTION PLAN. PROTECTIVE BARRIERS SHALL BE PLACED BEFORE PHYSICAL DEVELOPMENT STARTS AND SHALL STAY IN PLACE UNTIL AFTER PLANNING OFFICIAL AUTHORIZES THEIR REMOVAL OR A FINAL CERTIFICATE OF OCCUPANCY IS ISSUED, WHICHEVER OCCURS FIRST.
2. TREE PROTECTION FENCING SHALL BE CHAIN LINK, MINIMUM OF 6' HEIGHT, SECURED WITH STEEL POSTS, INSTALLED 5' BEYOND THE EDGE OF THE ROOT ZONE OR AS INDICATED ON THE TREE REMOVAL AND PROTECTION PLAN.
3. EXCAVATION WITHIN THE TREE PROTECTION ZONE WILL BE PERFORMED USING ONLY NON–MOTORIZED HANDHELD TOOLS AND SHALL BE THE MINIMUM NECESSARY TO ACCOMPLISH THE PURPOSE FOR THE EXCAVATION AND TO ENSURE LONG–TERM SURVIVAL OF THE TREE.
4. TREE PROTECTION FENCING SHALL BE FLUSH WITH THE INITIAL UNDISTURBED GRADE.
5. APPROVED SIGNS SHALL BE ATTACHED TO PROTECTION FENCING, AND VISIBLY STATING THAT INSIDE THE FENCING IS A TREE PROTECTION ZONE, NOT TO BE DISTURBED UNLESS PRIOR APPROVAL HAS BEEN OBTAINED FROM OWNER'S REPRESENTATIVE.
6. NO CONSTRUCTION ACTIVITY SHALL OCCUR WITHIN THE TREE PROTECTION ZONE, INCLUDING, BUT NOT LIMITED TO DUMPING OR STORAGE OF MATERIALS SUCH AS BUILDING SUPPLIES, SOIL, WASTE ITEMS, OR PARKED VEHICLES AND EQUIPMENT.
7. THE TREE PROTECTION ZONE SHALL REMAIN FREE OF CHEMICALLY INJURIOUS MATERIALS AND LIQUIDS SUCH AS PAINTS, THINNERS, CLEANING SOLUTIONS, PETROLEUM PRODUCTS, AND CONCRETE OR DRY WALL EXCESS, CONSTRUCTION DEBRIS, OR RUNOFF.
8. NO EXCAVATION, TRENCHING, GRADING, ROOT PRUNING OR OTHER ACTIVITY SHALL OCCUR WITHIN THE TREE PROTECTION ZONE UNLESS DIRECTED BY AN ARBORIST PRESENT ON SITE AND APPROVED BY OWNER'S REPRESENTATIVE.
9. NO FILL OR COMPACTION SHALL OCCUR WITHIN THE CRITICAL ROOT ZONES OF ANY OF THE TREES. IF COMPACTION IS UNAVOIDABLE, MEASURES SHALL BE TAKEN AS RECOMMENDED BY A CERTIFIED ARBORIST TO REDUCE OR MITIGATE THE IMPACT OF THE FILL OR COMPACTION.

NOTES:
1. EXISTING SOIL CHEMISTRY SHALL NOT BE ALTERED BY CONSTRUCTION ACTIVITIES. CHEMICAL WASTES AT CONSTRUCTION SITE SHALL BE DISPOSED OF PROPERLY AND NOT DRAINED ONTO SOIL.
2. CONSTRUCTION FENCING SHALL BE PLACED BEFORE CONSTRUCTION STARTS AND REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED.



1 TREE PROTECTION FENCING

Section

SCALE: NTS

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REGISTERED 345 Kurt Lango OREGON 3/20/96 LANDSCAPE ARCHITECT

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

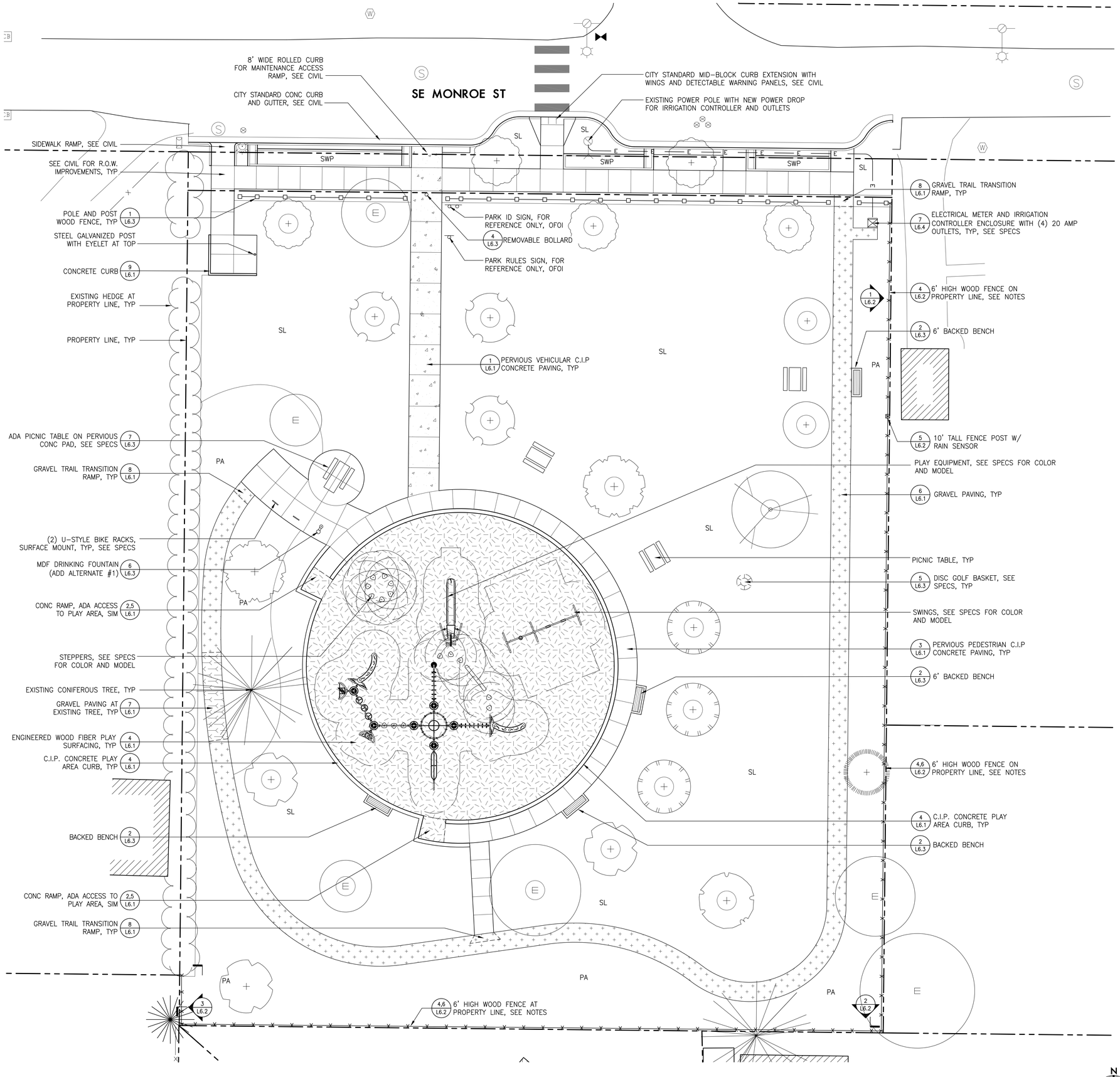
BID SET

TREE PROTECTION + SITE DEMO PLAN

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
PROJECT NO.	1723

SHEET L0.1



1 MATERIALS PLAN

SCALE: 1" = 10'

0 5' 10' 20'

N

MATERIALS LEGEND

- PROPERTY LINE
- PERVIOUS PEDESTRIAN C.I.P. CONCRETE PAVING
- PERVIOUS VEHICULAR C.I.P. CONCRETE PAVING
- GRAVEL TRAIL
- GRAVEL TRAIL AT EXISTING TREE
- ENGINEERED WOOD FIBER PLAY SURFACING
- PICNIC TABLE
- ADA PICNIC TABLE ON PERVIOUS CONCRETE PAVING
- 6' BENCH
- U-STYLE BIKE RACK
- DRINKING FOUNTAIN
- DISC GOLF HOLE
- E ELECTRICAL CONDUIT
- POLE AND POST WOOD FENCE
- 6' HIGH WOOD FENCE
- SURFACE UTILITY STRUCTURES
- SURFACE WATER UTILITY STRUCTURES
- POWER POLES
- SIGN
- ELECTRIC METER AND CONTROLLER ENCLOSURE
- EXISTING CONIFEROUS TREE
- E EXISTING DECIDUOUS TREE

MATERIALS NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN. SEE SHEETS L0.1 AND L0.2 AND SPECIFICATIONS FOR FENCING AND OTHER REQUIREMENTS.
3. PARK IMPROVEMENTS INCLUDE STOP 6' SHORT OF PROPERTY LINE ON BOTH SIDES OF PARK; CONNECTION TO BE COORDINATED WITH ADJACENT PROPERTY OWNERS IF/WHEN STREET IMPROVEMENTS ARE COMPLETED.
4. ALL NON-PERVIOUS CONCRETE PAVING TO RECEIVE LIGHT BROOM FINISH UNLESS OTHERWISE NOTED.
5. CONTRACTOR TO SUBMIT PAVING MOCK-UPS FOR APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
6. SEE SHEET L5.1 FOR LOCATIONS OF IRRIGATION SLEEVES UNDER PAVING.
7. EXTENT OF 6' HIGH WOOD GOOD NEIGHBOR FENCING TO BE COORDINATED WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION.
8. SEE CIVIL DRAWINGS FOR UTILITY INFORMATION.

ABBREVIATIONS

C.I.P.	CAST-IN-PLACE
CONC	CONCRETE
DWG	DRAWINGS
NIC	NOT IN CONTRACT
OFOI	OWNER FURNISHED, OWNER INSTALLED
PA	PLANTING AREA
PL	PROPERTY LINE
ROW	RIGHT OF WAY
SIM	SIMILAR
SL	SEEDED LAWN
SPECS	SPECIFICATIONS
SWP	STORMWATER PLANTER
TYP	TYPICAL
W/	WITH

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WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

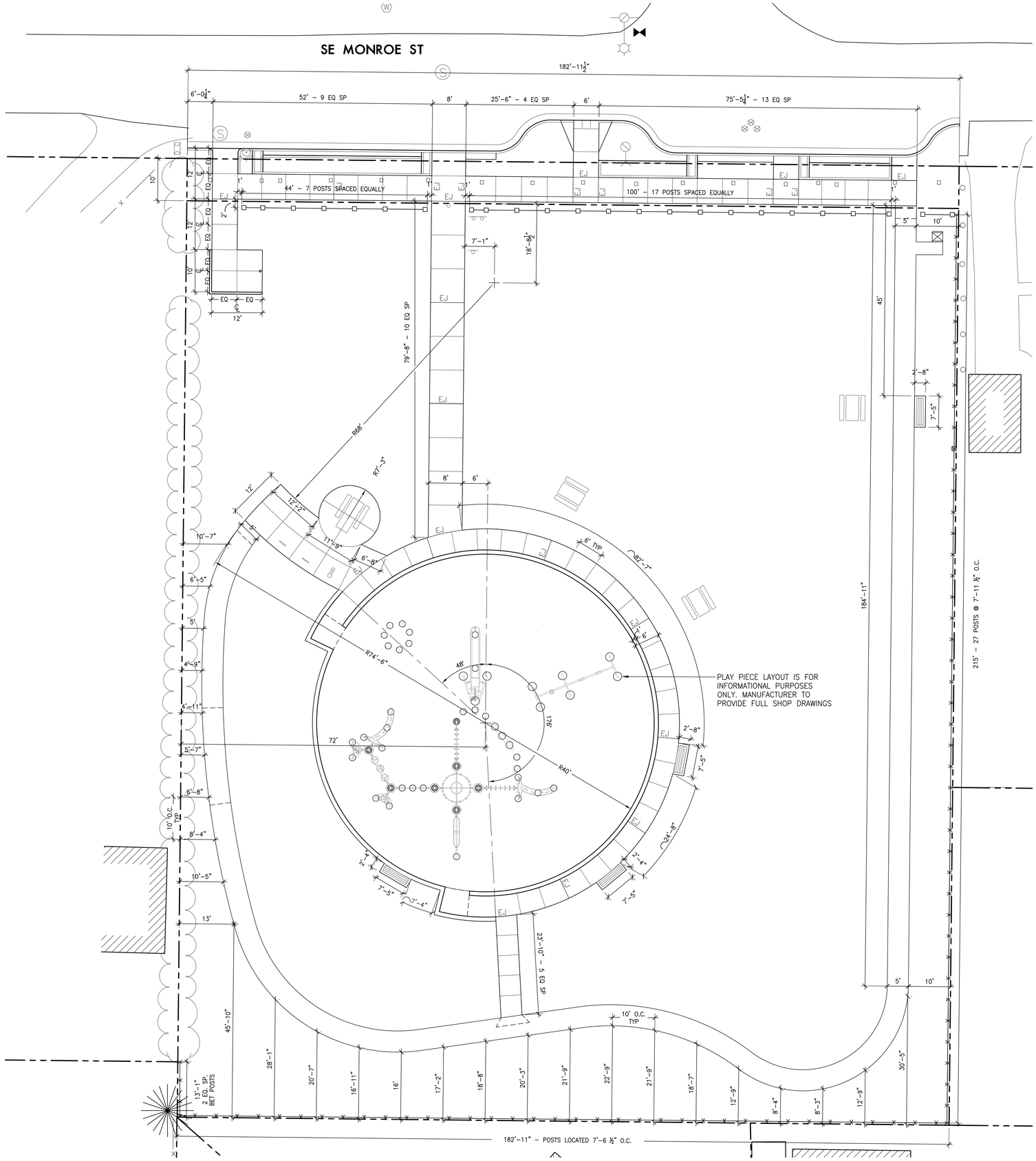
BID SET

MATERIALS PLAN

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
PROJECT NO.	1723

SHEET L1.1



1 LAYOUT PLAN

SCALE: 1" = 10'

0 5' 10' 20'

N

MATERIALS LEGEND

- PROPERTY LINE
- PEDESTRIAN CONC PAVING
- EXPANSION JOINT
- TOOLED CONTROL JOINT
- PICNIC TABLE
- ADA PICNIC TABLE
- 6' BENCH
- U-STYLE BIKE RACK
- DRINKING FOUNTAIN
- SPLIT RAIL WOOD FENCE
- 6' HIGH WOOD FENCE
- SURFACE UTILITY STRUCTURES
- SURFACE WATER UTILITY STRUCTURES
- POWER POLES
- SIGN
- ELECTRIC METER AND CONTROLLER ENCLOSURE

LAYOUT NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN; SEE SHEETS L0.1 AND L0.2 AND SPECIFICATIONS FOR FENCING AND OTHER REQUIREMENTS.
3. SEE CIVIL DRAWING FOR LOCATION OF UTILITIES.
4. FOR DIMENSIONS WHERE INCHES ARE NOT GIVEN, ASSUME 0 INCHES, SUCH THAT 2' EQUALS 2'-0"
5. PAVING DIMENSIONS ARE TO PROPERTY LINE OR FACE OF CURB UNLESS OTHERWISE NOTED.
6. IF THERE IS A CONFLICT WITH LAYOUT IN THE FIELD, NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
7. DIMENSIONS TO JOINT LINES ARE TO CENTERLINES, TYP.
8. DIMENSIONS TO AREA DRAINS ARE TO CENTER POINTS, TYP.
9. GRAVEL PATHWAY SHOULD CONSIST OF SMOOTH AREAS AND CURVES WITH NO KINKS, TYP.

ABBREVIATIONS

BOC	BACK OF CURB
CJ	CONTROL JOINT
DIA	DIAMETER
EJ	EXPANSION JOINT
EQ	EQUAL
EW	EACH WAY
FOC	FACE OF CURB
NO	NUMBER
OC	ON CENTER
POT	POINT OF TANGENCY
R	RADIUS
SP	SPACES

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REGISTERED LANDSCAPE ARCHITECT
345
Kurt Lango
OREGON
3/20/96

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

LAYOUT PLAN

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
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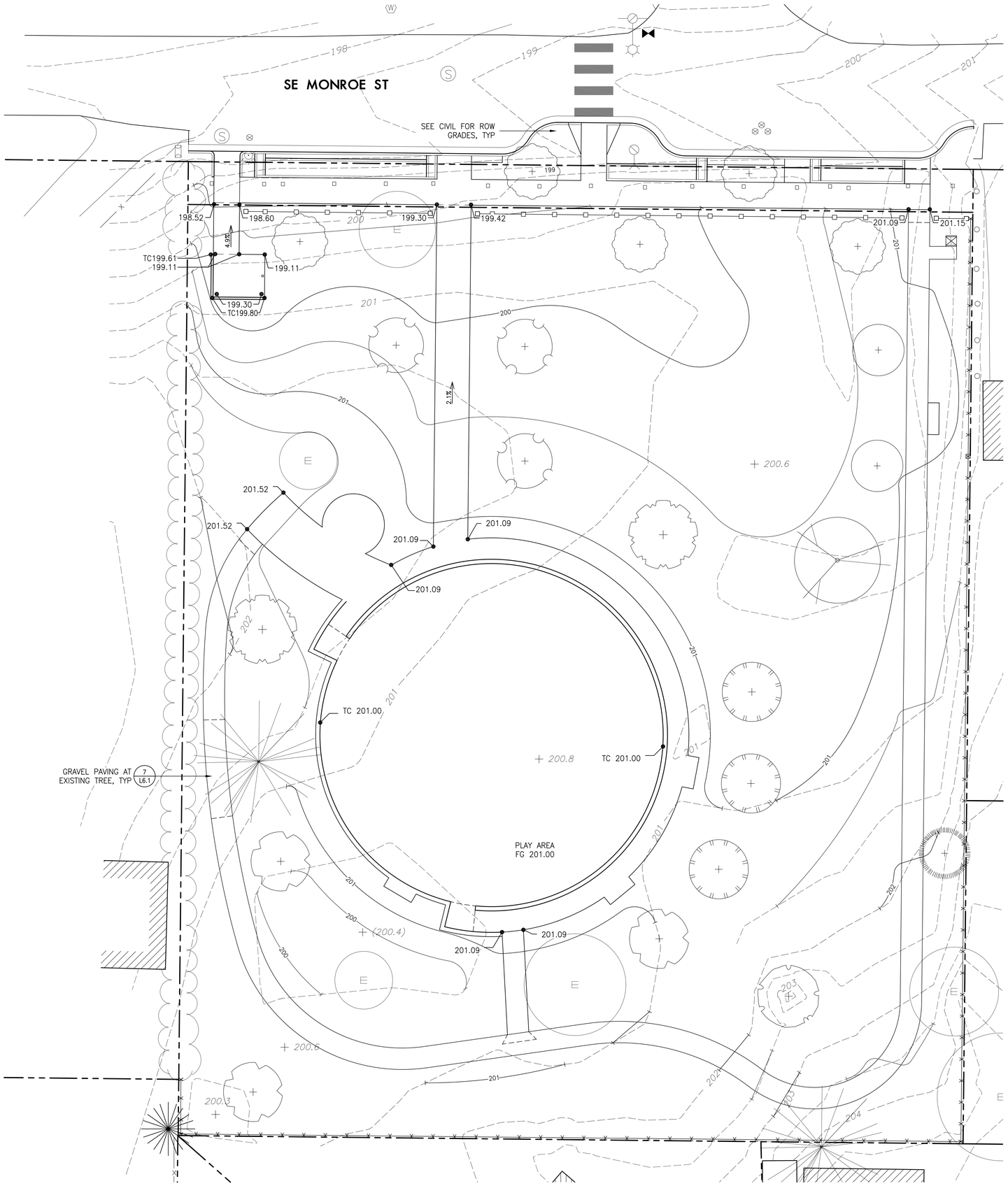
SHEET
L2.1



1 GRADING PLAN

SCALE: 1" = 10'

0 5' 10' 20'

N

LEGEND

- PROPERTY LINE
- PEDESTRIAN CONC PAVING
- 200 EXISTING CONTOUR (0.5' INCREMENTS)
- 200 PROPOSED CONTOUR
- GRADE BREAK LINE
- 201.00 SPOT ELEVATION
- 2.00% PERCENTAGE OF SLOPE
- DIRECTION OF SLOPE
- POLE AND POST FENCE
- 6' HIGH WOOD FENCE
- SURFACE UTILITY STRUCTURES
- SURFACE WATER UTILITY STRUCTURES
- POWER POLES
- SIGN
- ELECTRIC METER AND CONTROLLER ENCLOSURE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE

GRADING NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN. SEE SHEETS L0.1 AND L0.2 AND SPECIFICATIONS FOR FENCING AND OTHER REQUIREMENTS.
3. CONTOURS SHOWN IN 0.5' INCREMENTS.
4. SET STRAIGHT GRADES BETWEEN GIVEN ELEVATIONS UNLESS OTHERWISE INDICATED.
5. GRADE BREAK LINES ARE SHOWN GRAPHICALLY TO ILLUSTRATE DRAINAGE PATTERNS, AND ARE NOT INTENDED TO BE ACTUAL JOINT LINES, UNLESS THEY FALL ON EXPANSION JOINT LOCATIONS.
6. SPOT ELEVATIONS TAKE PRECEDENCE OVER LANDSCAPE CONTOURS.
7. PROVIDE 1.5% CROSS SLOPE ON ALL PAVED WALKS (2% MAX), TYP.
8. DO NOT DISTURB AREAS NOT TO BE GRADED.
9. ADJUSTMENTS OF SOFT SWALE AREAS ±2" MAY BE NECESSARY TO IMPROVE DRAINAGE. THESE ADJUSTMENTS SHALL BE DONE AT NO COST TO THE OWNER.
10. CONTRACTOR TO VERIFY EXISTING GRADES AT ALL LOCATIONS WHERE NEW PAVING IS MATCHING EXISTING PAVING; IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE IF DISCREPANCIES ARE FOUND.
11. DESIGN INTENT IS TO BALANCE THE CUT AND FILL ON THE SITE. GRADING OF SOFT-SURFACE AREAS MAY BE ADJUSTED IN ORDER TO BALANCE CUT AND FILL ON SITE.
12. ADDITIONAL STORMWATER TREATMENT AND/OR DRAINAGE FEATURES MAY BE REQUIRED, CONTINGENT ON A GEOTECHNICAL REPORT FOR THE SITE. GEOTECHNICAL REPORT TO BE PROVIDED BY NCPRD AT A FUTURE PHASE OF THE PROJECT.
13. SEE CIVIL DRAWINGS FOR UNDERGROUND UTILITIES AND DRAINAGE FEATURES.

ABBREVIATIONS

AD	AREA DRAIN (RIM ELEVATION)
BC	BOTTOM OF CURB
BF	BOTTOM OF FOOTING
CB	CATCH BASIN (RIM ELEVATION)
EL	ELEVATION
EQ	EQUAL
EX	EXISTING
HP	HIGH POINT
IE	INVERT ELEVATION
LP	LOW POINT
MATCH	MATCH EXISTING GRADE
MAX	MAXIMUM
MIN	MINIMUM
RIM	RIM ELEVATION
SIM	SIMILAR
TC	TOP OF CURB
TYP	TYPICAL

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WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

GRADING PLAN

REVISIONS

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DRAWN BY	KF, BM
DATE	03.01.18
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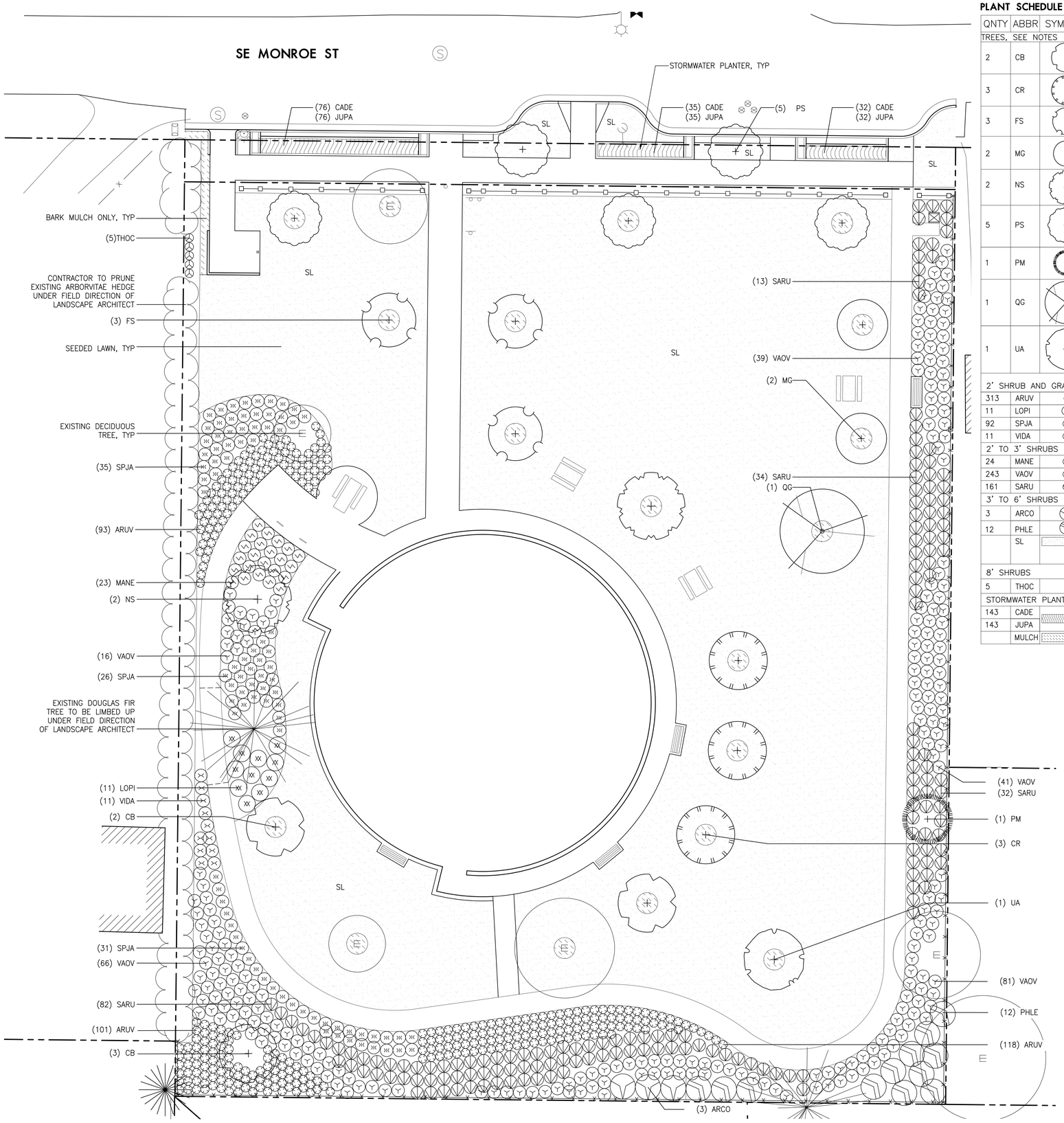
SHEET L3.1



1 PLANTING PLAN

SCALE: 1" = 10'

0 5' 10' 20'

N

PLANT SCHEDULE

QNTY	ABBR	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE/COND	SPACING
TREES, SEE NOTES						
2	CB		Carpinus betulus 'Fastigiata'	Fastigiate European Hornbeam	2½" CAL., B&B	As Shown
3	CR		Cornus x 'Rutban'	Aurora Dogwood	2½" CAL., B&B	As Shown
3	FS		Fagus sylvatica 'Dawyck'	Fastigiate Beech (Green)	2½" CAL., B&B	As Shown
2	MG		Magnolia grandiflora 'Victoria'	Victoria Magnolia	2½" CAL., B&B	As Shown
2	NS		Nyssa sylvatica	Tupelo Tree	2½" CAL., B&B	As Shown
5	PS		Prunus sargentii 'Columnaris'	Columnar Sargent Cherry	2½" CAL., B&B	As Shown
1	PM		Pseudotsuga menziesii	Douglas Fir	8' HT., B&B	As Shown
1	QG		Quercus garryana	Oregon White Oak	1" CAL., B&B	As Shown
1	UA		Ulmus 'Accolade'	Accolade Elm	2½" CAL., B&B	As Shown
2' SHRUB AND GRASSES						
313	ARUV		Arctostaphylos uva ursi	Kinnikinnick	#1/CONT	As Shown
11	LOPI		Lonicera pileata	Boxleaf Honeysuckle	#2/CONT	As Shown
92	SPJA		Spiraea japonica 'Goldmound'	Goldmound Spirea Japonica	#3/CONT	As Shown
11	VIDA		Viburnum davidii	David Viburnum	#3/CONT	As Shown
2' TO 3' SHRUBS						
24	MANE		Mahonia nervosa	Low Oregon Grape	#3/CONT	As Shown
243	VAOV		Vaccinium ovatum	Evergreen Huckleberry	#5/CONT	As Shown
161	SARU		Sarcococca ruscifolia	Fragrant Sweet Box	#2/CONT	As Shown
3' TO 6' SHRUBS						
3	ARCO		Arctostaphylos columbiana	Hairy Manzanita	#5/CONT	As Shown
12	PHLE		Philadelphus lewisii	Mock Orange	#5/CONT	As Shown
	SL		SEEDED LAWN PRO-TIME SUPREME MIX; SEED AT 8#/1000 SF, AVAILABLE AT HOBBS & HOPKINS (503) 239-7518			
8' SHRUBS						
5	THOC		Thuja occidentalis 'Emerald Green'	Emerald Green Arborvitae	6' HT	As Shown
STORMWATER PLANTER						
143	CADE		Carex densa	Dense Sedge	#1/CONT	As Shown
143	JUPA		Juncus patens	Spreading Rush	#1/CONT	As Shown
	MULCH		BARK MULCH ONLY			

PLANTING NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN. SEE SHEETS L0.1 AND L0.2 AND SPECIFICATIONS FOR FENCING AND OTHER REQUIREMENTS.
3. EXISTING ON-SITE SOIL SHALL BE USED FOR PLANTING AND SHALL BE AMENDED ACCORDING TO THE RECOMMENDATIONS IN THE SOIL TEST REPORT; SEE SPECIFICATIONS.
4. ALL PLANT MATERIAL SHALL BE NURSERY GROWN, WELL ROOTED, AND WELL BRANCHED. ALL TREES MUST BE FREE OF INSECTS, DISEASES, MECHANICAL INJURY, AND OTHER OBJECTIONABLE FEATURES WHEN PLANTED. ALL PLANT MATERIAL SHALL CONFORM TO "AMERICAN STOCK STANDARDS" LATEST EDITION.
5. ALL PLANT MATERIAL TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. SEE SPECIFICATIONS.
6. PLANT SPACING SHALL TAKE PRECEDENCE OVER IRRIGATION VALVE BOX LOCATIONS. INSTALLED VALVE BOXES THAT CONFLICT WITH ACCEPTED PLANT LAYOUT SHALL BE MOVED TO POSITION BETWEEN PLANTS.
7. STREET TREE PLANTING SHALL BE DONE PER CITY OF MILWAUKIE REQUIREMENTS, SEE DETAIL 15/L6.3. SEE DETAIL 12/L6.3 FOR ALL OTHER TREE PLANTING.
8. TOTAL PLANT QUANTITIES ARE ESTIMATES BASED ON PLANT SPACING, SEE DETAIL 14/L6.3. EXACT PLANT QUANTITIES AND LOCATIONS TO BE DETERMINED IN FUTURE PHASES OF THE PROJECT.
9. CLEAR PLANT BEDS OF ALL GRAVEL AND DEBRIS PRIOR TO SOIL PREPARATION AND PLANTING, FOR APPROVAL BY OWNER'S REPRESENTATIVE.

ABBREVIATIONS

B&B	BALLED & BURLAPPED	MAX	MAXIMUM
CAL	CALIPER	NO	NUMBER
CONT	CONTAINER	O.C.	ON CENTER
DIA	DIAMETER	SIM	SIMILAR
DBH	DIAMETER AT BREAST HEIGHT	SL	SEEDED LAWN
EQ	EQUAL	SPECS	SPECIFICATIONS
HT	HEIGHT	TYP	TYPICAL
MIN	MINIMUM	#	CONTAINER SIZE

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WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

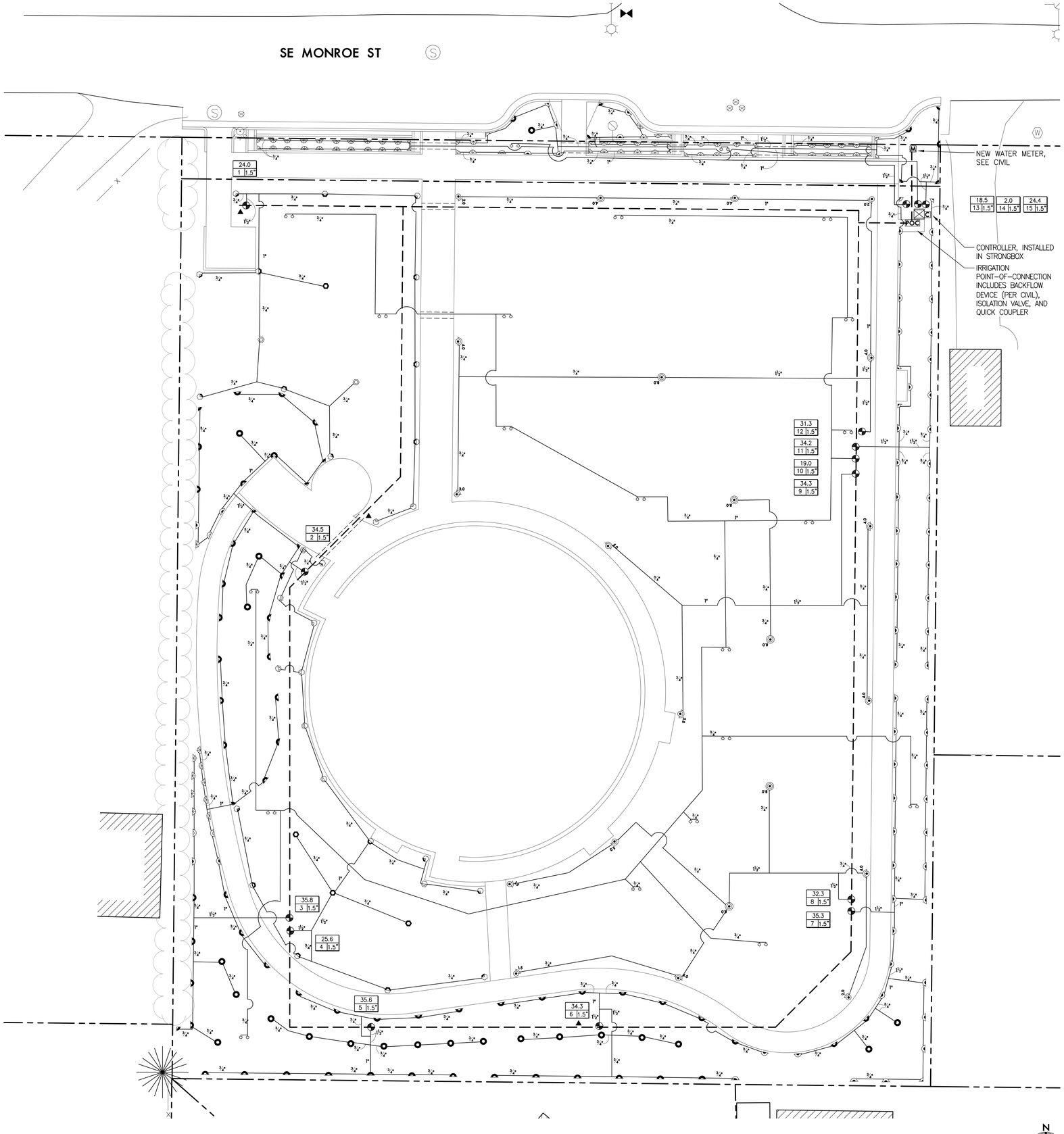
BID SET

PLANTING PLAN

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
PROJECT NO.	1723

SHEET L4.1



1 IRRIGATION PLAN

SCALE: 1" = 10'

IRRIGATION LEGEND

EQUIPMENT	
Symbol	Description
	REMOTE CONTROL VALVE, SEE SPECS AND DETAILS
	LOW-FLOW CONTROL ZONE KIT, SEE SPECS AND DETAILS
	ISOLATION VALVE, SEE SPECS AND DETAILS
	QUICK COUPLER, SEE SPECS AND DETAILS
	SWING CHECK VALVE, SEE SPECS AND DETAILS
C	CONTROLLER, SEE SPECS AND DETAILS
POC	POINT-OF-CONNECTION INCLUDES MASTER VALVE, ISOLATION VALVE AND QUICK COUPLER
M	WATER METER, BY OTHERS; FIELD VERIFY
DCV	DOUBLE-CHECK VALVE, SEE CIVIL
	NEW MAINLINE, SCH. 40 PVC, 2" OR AS NOTED
3/4"	NEW LATERAL LINE, SCH 40 PVC, SIZE AS NOTED
	NEW IRRIGATION SLEEVE, 4" SCH. 40 PVC, OR AS NOTED

23.8 14 1.5" — GALLONS PER MINUTE; VALVE SIZE; ZONE NUMBER

IRRIGATION NOTES

1. THIS PLAN IS BASED ON A SURVEY BY HANER, ROSS AND SPORSEEN, DATED 8/25/2014. NOTIFY ARCHITECT OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. INSTALL IRRIGATION SYSTEM IN ACCORDANCE WITH ALL LOCAL CODES AND ORDINANCES.
3. PRIOR TO COMMENCEMENT OF ANY IRRIGATION WORK, VERIFY MINIMUM FLOW RATE OF 50 GPM AND MINIMUM DYNAMIC (WORKING) PRESSURE OF 50PSI WHEN FLOWING AT THE POINT OF CONNECTION.
4. PROTECT EXISTING VEGETATION TO REMAIN. SEE SHEETS L0.1 AND L0.2 AND SPECIFICATIONS FOR FENCING AND OTHER REQUIREMENTS.
5. IRRIGATION PLANS ARE DIAGRAMMATIC. PLACE ALL IRRIGATION HEADS IN PLANTED AREAS AND PLACE ALL VALVES IN SHRUB AREAS. FIELD ADJUST LINES TO AVOID CONFLICT WITH UTILITIES.
6. ALL PIPES SHOWN BENEATH PAVING SURFACES FOR GRAPHIC CLARITY ONLY. ACTUAL LOCATION OF PIPES SHALL BE IN PLANTING AREAS, UNLESS OTHERWISE NOTED.
7. PROVIDE SLEEVES UNDER ALL PAVED AREAS FOR IRRIGATION MAINLINE AND LATERALS.
8. COORDINATE IRRIGATION POINTS OF CONNECTION AND LOCATION OF REMOTE CONTROL VALVE ASSEMBLIES AND SLEEVES. COORDINATE ALL WORK WITH OTHER TRADES INVOLVED.
9. PLACE ALL VALVES IN VALVE BOXES AND IN A MANNER THAT FACILITATES ACCESS FOR MAINTENANCE. SIZE BOXES TO ACCOMMODATE COMPLETE VALVE ASSEMBLY. MAINTAIN MIN. 12" BETWEEN VALVE BOXES AND PAVEMENT.
10. IRRIGATION LATERALS ARE SIZED STARTING AT VALVE AND CONTINUING IN DIRECTION OF FLOW. REDUCTIONS IN PIPE SIZE ARE LABELED BEGINNING DOWNSTREAM OF NEAREST FITTING. ALL LATERALS NOT SIZED ARE MINIMUM 3/4" OR SAME SIZE AS NEAREST ADJACENT PIPE.
11. CONTRACTOR TO MARK LAYOUT OF TRENCHES AND VALVE LOCATIONS FOR PREVIEW BY OWNER IN FIELD PRIOR TO CONSTRUCTION. TRENCHING UNDER EXISTING TREES WILL NOT BE ALLOWED UNLESS APPROVED BY CERTIFIED ARBORIST.
12. INSTALL AND ADJUST ALL COMPONENTS OF IRRIGATION SYSTEM TO PROVIDE ADEQUATE COVERAGE OF ALL PLANTING AREAS AND MINIMIZE OVERSPRAY ONTO BUILDINGS AND PAVING AREAS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE WORKING SYSTEM.
13. PROVIDE 12" POP-UP SPRINKLER BODIES FOR ALL SHRUB AND GROUNDCOVER BEDS, AND 4" SPRINKLER BODIES FOR LAWN AREAS AND SHRUB BEDS IMMEDIATELY ADJACENT TO PARKING AREAS.
14. SEE MATERIALS PLAN FOR RAIN SENSOR LOCATION.

IRRIGATION LEGEND

ROTORS						
Sym	Rotor	Nozzle	Arc	GPM	PSI	Radius
1.5	RAINBIRD 5004+PC	1.5	40-360°	1.54	45	35'
2.0	RAINBIRD 5004+PC	2.0	40-360°	2.07	45	37'
2.5	RAINBIRD 5004+PC	2.5	40-360°	2.51	45	37'
3.0	RAINBIRD 5004+PC	3.0	40-360°	3.09	45	40'
4.0	RAINBIRD 5004+PC	4.0	40-360°	4.01	45	42'
5.0	RAINBIRD 5004+PC	5.0	40-360°	5.09	45	45'
6.0	RAINBIRD 5004+PC	6.0	40-360°	6.01	45	46'
8.0	RAINBIRD 5004+PC	8.0	40-360°	8.03	45	47'
SPRAY HEADS						
Sym	Spray Head	Nozzle	Arc	GPM	Radius	
	RAINBIRD 1800	4VAN-90	90°	.29	4'	
	RAINBIRD 1800	4VAN-180	180°	.45	4'	
	RAINBIRD 1800	4VAN-270	270°	.73	4'	
	RAINBIRD 1800	6VAN-90	90°	.37	6'	
	RAINBIRD 1800	6VAN-180	180°	.60	6'	
	RAINBIRD 1800	6VAN-270	270°	1.10	6'	
	RAINBIRD 1800	8VAN-90	90°	.75	8'	
	RAINBIRD 1800	8VAN-180	180°	.75	8'	
	RAINBIRD 1800	8VAN-270	270°	.75	8'	
	RAINBIRD 1800	10VAN-90	90°	.75	10'	
	RAINBIRD 1800	10VAN-180	180°	1.45	10'	
	RAINBIRD 1800	10VAN-270	270°	2.10	10'	
	RAINBIRD 1800	10VAN-360	360°	2.60	10'	
	HUNTER RZWS-36	BUBBLER		.50	N/A	
	RAINBIRD 1800-SAM-P45	R13-18 90	90°	.49	13'-18'	
	RAINBIRD 1800-SAM-P45	R13-18 180	180°	.98	13'-18'	
	RAINBIRD 1800-SAM-P45	R13-18 360	360°	1.96	13'-18'	
	RAINBIRD 1800-SAM-P45	R17-24 90	90°	.92	17'-24'	
	RAINBIRD 1800-SAM-P45	R17-24 180	180°	1.84	14'-19'	
	RAINBIRD 1800-SAM-P45	R17-24 360	360°	3.67	14'-19'	

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IRRIGATION PLAN

REVISIONS

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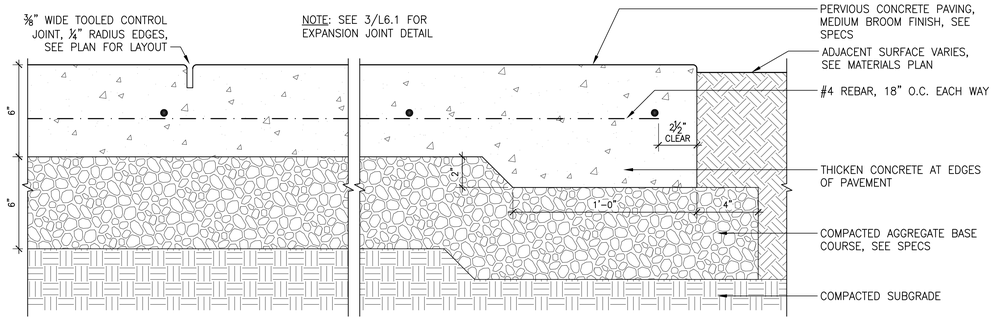
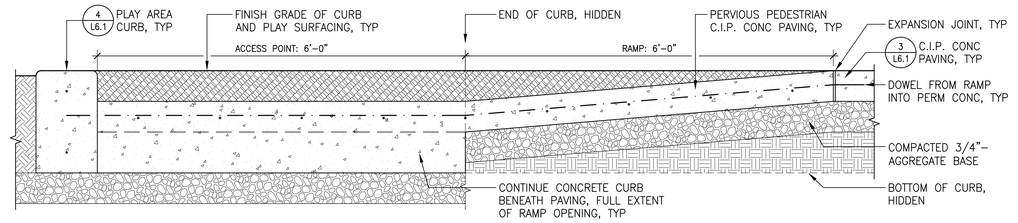
SHEET L5.1



1 PERVIOUS VEHICULAR CONCRETE PAVING

Section

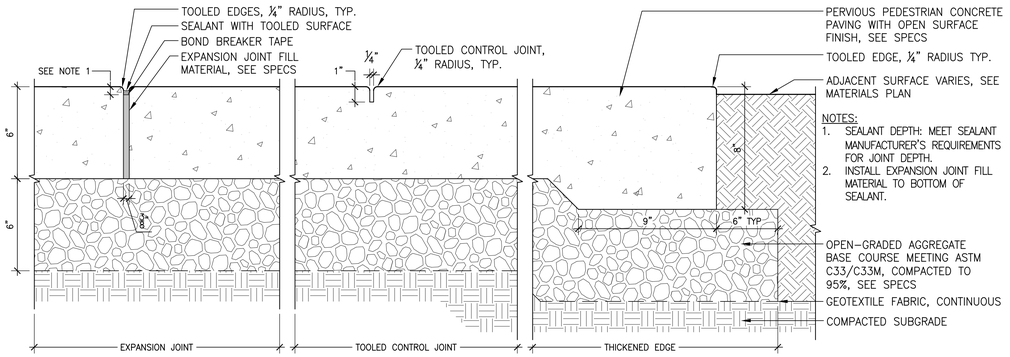
SCALE: 3" = 1'-0"



2 PLAY AREA RAMP, LONGITUDINAL SECTION

Section

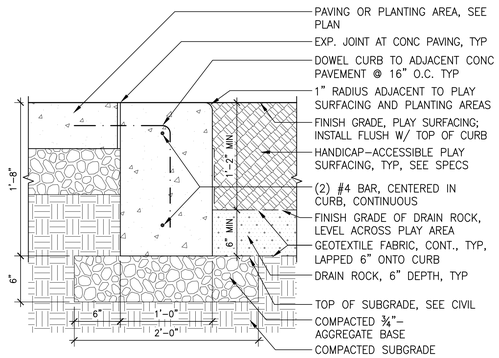
SCALE: 1" = 1'-0"



3 PERVIOUS PEDESTRIAN CONCRETE PAVING

Section

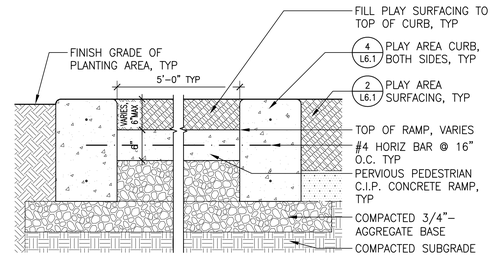
SCALE: 3" = 1'-0"



4 PLAY AREA CURB AND SURFACING

Section

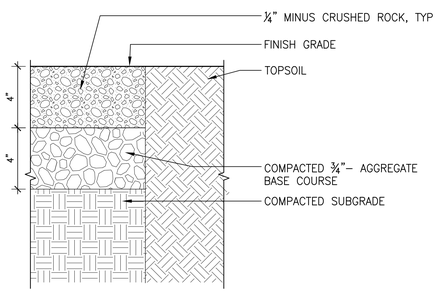
SCALE: 1 1/2" = 1'-0"



5 PLAY AREA RAMP, CROSS SECTION

Section

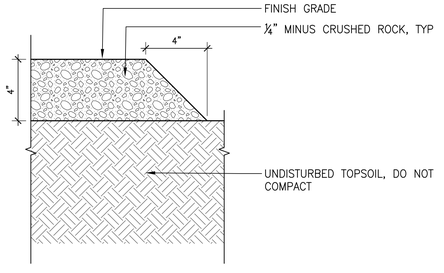
SCALE: 1" = 1'-0"



6 GRAVEL PAVING

Section

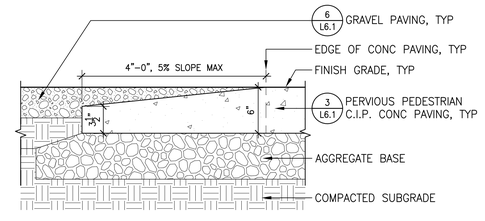
SCALE: 3" = 1'-0"



7 GRAVEL PAVING AT EXISTING TREE

Section

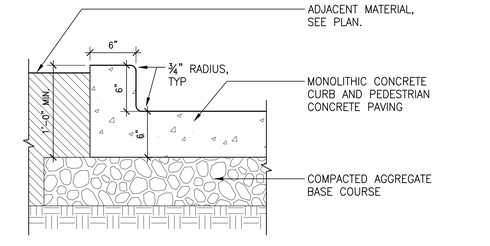
SCALE: 3" = 1'-0"



8 GRAVEL TRANSITION RAMP

Section

SCALE: 1 1/2" = 1'-0"



9 CONCRETE CURB

Section

SCALE: 1 1/2" = 1'-0"

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Kurt Lango
OREGON
3/20/96

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

LANDSCAPE DETAILS

REVISIONS

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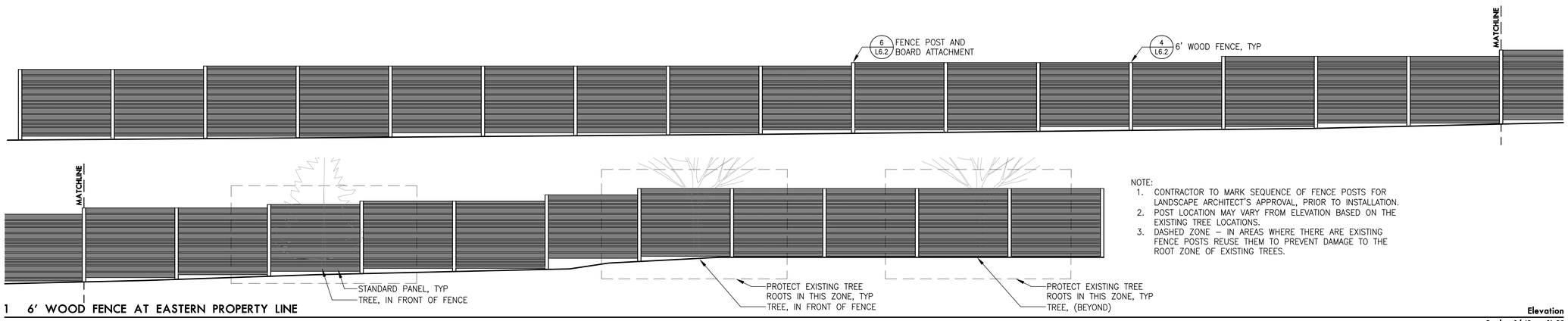
SHEET

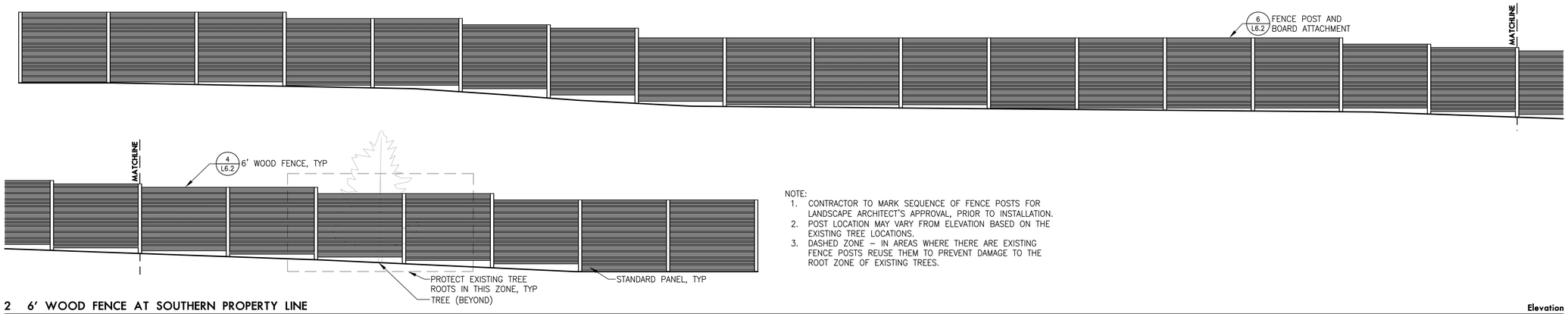
L6.1



NOTE:
1. CONTRACTOR TO MARK SEQUENCE OF FENCE POSTS FOR LANDSCAPE ARCHITECT'S APPROVAL, PRIOR TO INSTALLATION.
2. POST LOCATION MAY VARY FROM ELEVATION BASED ON THE EXISTING TREE LOCATIONS.
3. DASHED ZONE – IN AREAS WHERE THERE ARE EXISTING FENCE POSTS REUSE THEM TO PREVENT DAMAGE TO THE ROOT ZONE OF EXISTING TREES.

1 6' WOOD FENCE AT EASTERN PROPERTY LINE

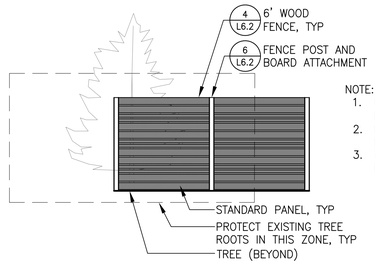
Elevation
Scale: 1/4" = 1'-0"



NOTE:
1. CONTRACTOR TO MARK SEQUENCE OF FENCE POSTS FOR LANDSCAPE ARCHITECT'S APPROVAL, PRIOR TO INSTALLATION.
2. POST LOCATION MAY VARY FROM ELEVATION BASED ON THE EXISTING TREE LOCATIONS.
3. DASHED ZONE – IN AREAS WHERE THERE ARE EXISTING FENCE POSTS REUSE THEM TO PREVENT DAMAGE TO THE ROOT ZONE OF EXISTING TREES.

2 6' WOOD FENCE AT SOUTHERN PROPERTY LINE

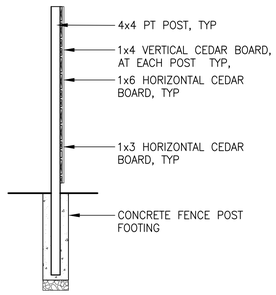
Elevation
Scale: 1/4" = 1'-0"



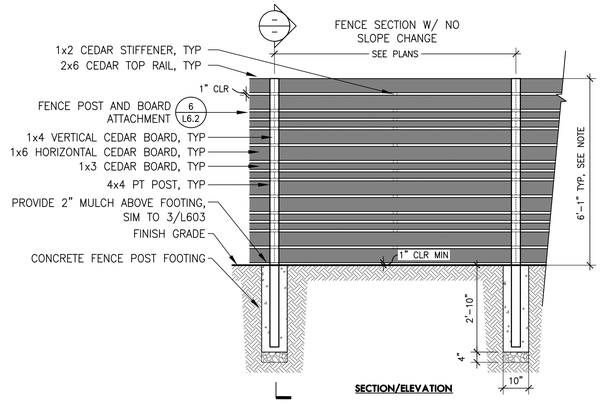
NOTE:
1. CONTRACTOR TO MARK SEQUENCE OF FENCE POSTS FOR LANDSCAPE ARCHITECT'S APPROVAL, PRIOR TO INSTALLATION.
2. POST LOCATION MAY VARY FROM ELEVATION BASED ON THE EXISTING TREE LOCATIONS.
3. WITHIN THE DASHED ZONE – IN AREAS WHERE THERE ARE EXISTING FENCE POSTS REUSE THEM TO PREVENT DAMAGE TO THE ROOT ZONE OF EXISTING TREES.

3 6' WOOD FENCE AT WESTERN PROPERTY LINE

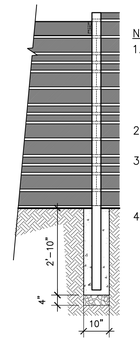
Elevation
Scale: 1/4" = 1'-0"



SECTION (AT 6' POST)



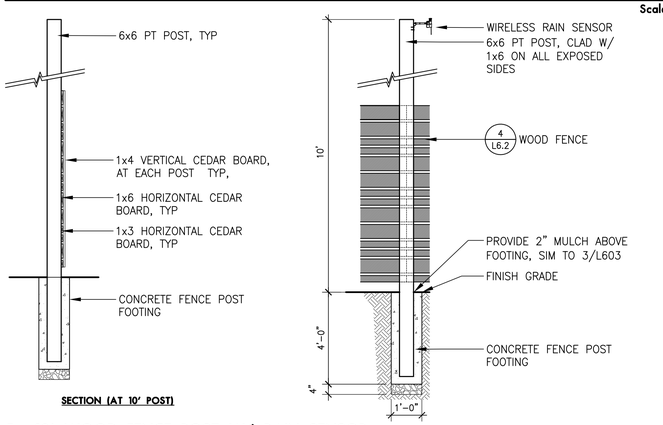
SECTION/ELEVATION



NOTES:
1. TOP OF FENCE SHALL BE LEVEL BETWEEN POSTS. ADJUST POST HEIGHT AS REQUIRED TO ALLOW FOR GRADE CHANGE ACROSS THE SITE, 2" MAX.
2. SEE SPECS FOR FENCE STAIN/FINISH.
3. MARK SEQUENCE OF FENCE POSTS FOR LANDSCAPE ARCHITECT'S APPROVAL PRIOR TO INSTALLATION
4. CONTRACTOR TO PROVIDE SHOP DRAWINGS

4 6' WOOD FENCE

Section/ Elevation
SCALE: 1/2" = 1'-0"

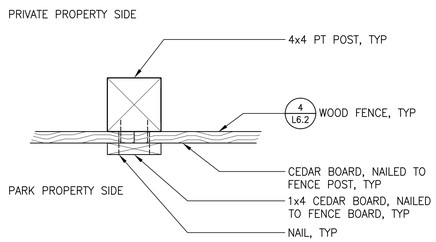


SECTION (AT 10' POST)

5 10' WOOD FENCE POST W/ RAIN SENSOR

Section
SCALE: 1/2" = 1'-0"

NOTE:
SEE SPECS FOR FENCE
HARDWARE



6 FENCE POST AND BOARD ATTACHMENT

Section
SCALE: 3" = 1'-0"

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LANDSCAPE DETAILS

REVISIONS

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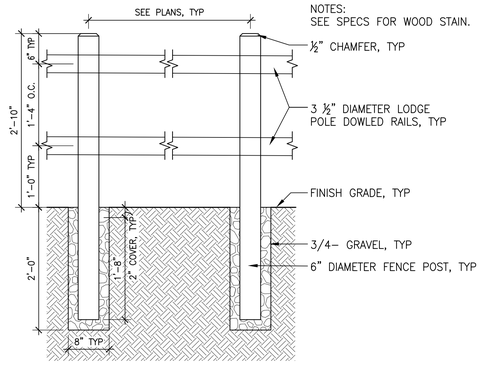
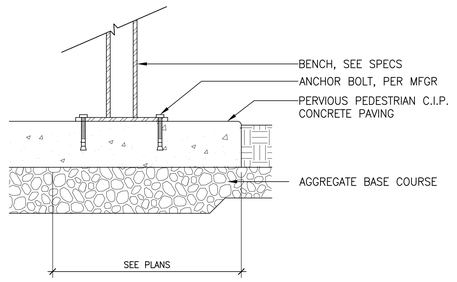
SHEET
L6.2



1 POLE AND POST FENCE

Section

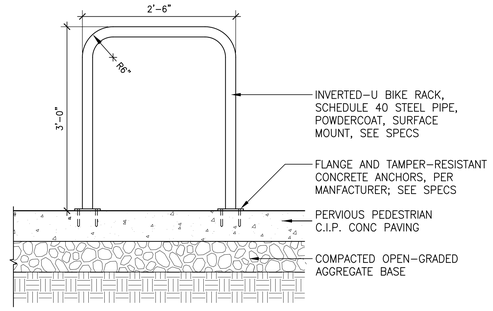
SCALE: 1" = 1'-0"



2 BENCH

Section

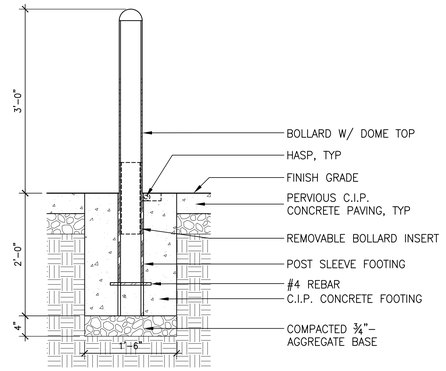
SCALE: 1" = 1'-0"



3 BIKE RACK

Section

SCALE: 1" = 1'-0"



4 REMOVABLE BOLLARD

Section

SCALE: 1" = 1'-0"

5 DISK GOLF TARGET

Section

SCALE: 1" = 1'-0"

6 DRINKING FOUNTAIN (ADD ALTERNATE #1)

Section

SCALE: 1" = 1'-0"

7 PICNIC TABLE ANCHOR

Section

SCALE: 1-1/2" = 1'-0"

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WICHITA PARK
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

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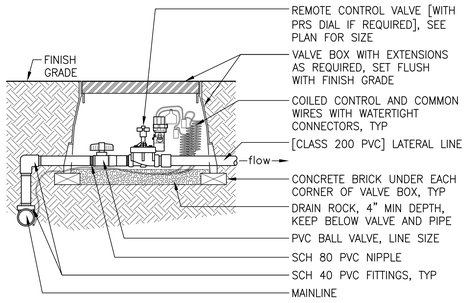
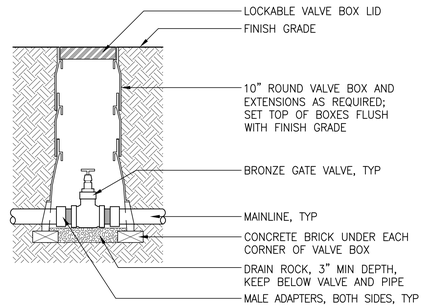
SHEET L6.3



NOTES:
1. PVC PIPE AND FITTINGS UPSTREAM OF VALVE TO BE SAME SIZE AS MAINLINE OR AS INDICATED ON PLAN.
2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

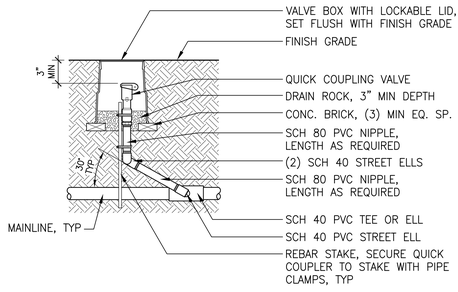
1 REMOTE CONTROL VALVE

Section
NTS



2 ISOLATION (GATE) VALVE

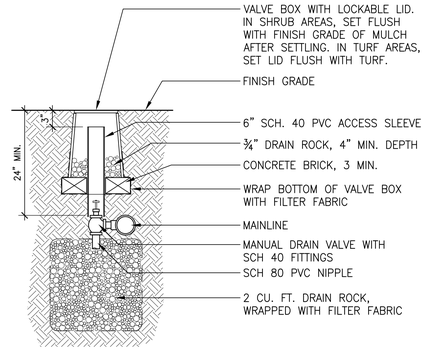
Section
NTS



NOTE: USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

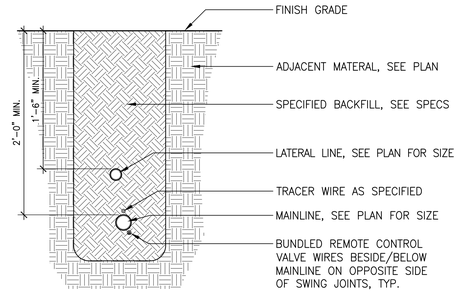
3 QUICK COUPLER

Section
NTS



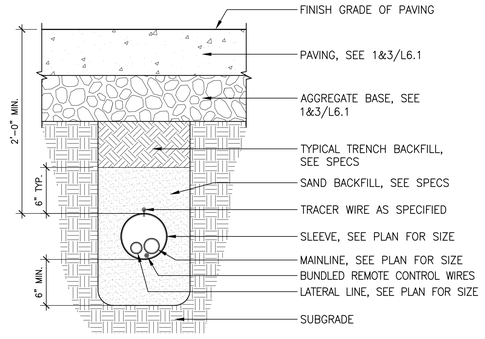
4 MANUAL DRAIN VALVE

Section
NTS



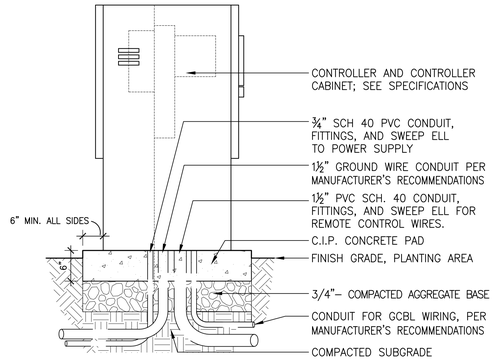
5 IRRIGATION TRENCH

Section
NTS



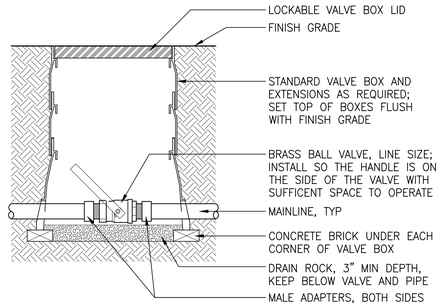
6 IRRIGATION SLEEVE

Section
NTS



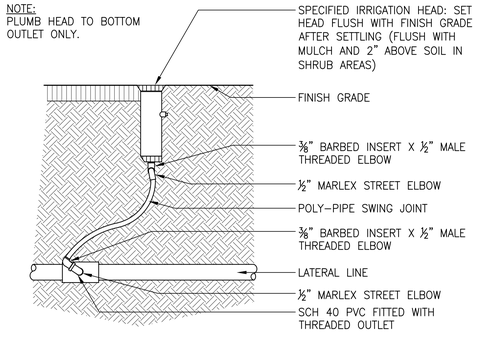
7 IRRIGATION CONTROLLER AND CABINET

Section
NTS



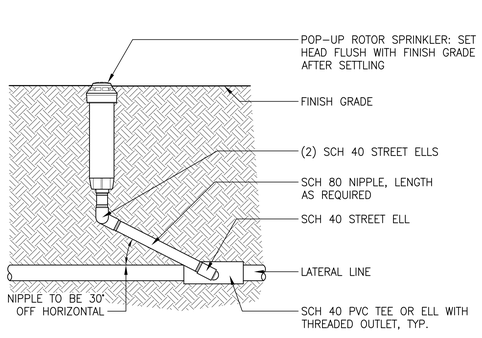
8 BALL VALVE

Section
NTS



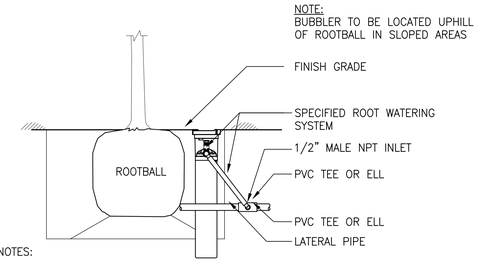
9 SPRAY HEAD

Section
NTS



10 ROTOR

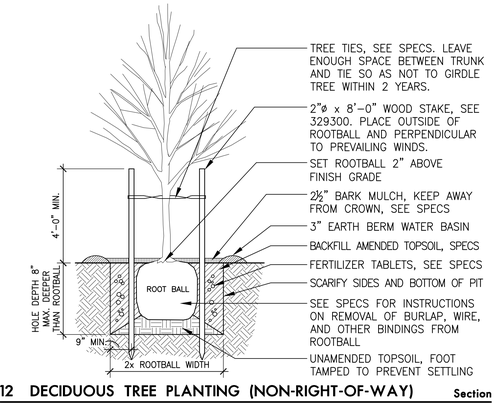
Section
NTS



NOTES:
1. INSTALL PRODUCT SO THAT THE GRATE IS EVEN WITH FINISH GRADE OR TOP OF MULCH.
2. WHEN INSTALLING IN EXTREMELY HARD OR CLAY SOILS, ADD 3/4" (1,9 CM) GRAVEL UNDER AND AROUND THE UNIT TO ALLOW FASTER WATER INFILTRATION AND ROOT PENETRATION.
3. ONCE RWS HAS BEEN INSTALLED FILL THE BASKET WITH PEA GRAVEL BEFORE LOCKING LID.

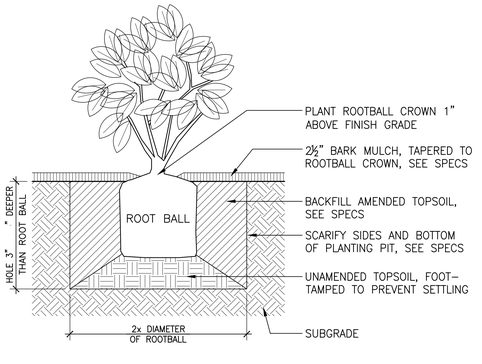
11 BUBBLER AT TREE

Section
NTS



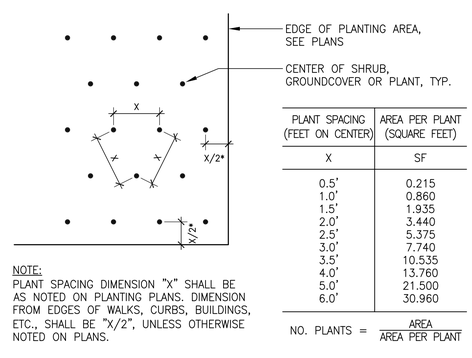
12 DECIDUOUS TREE PLANTING (NON-RIGHT-OF-WAY)

Section
NTS



13 SHRUB PLANTING

Section
NTS



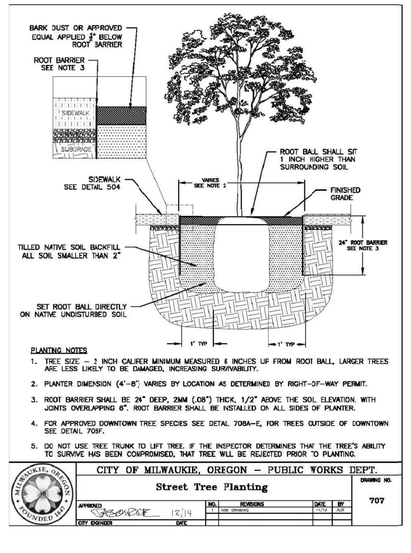
NOTE:
PLANT SPACING DIMENSION "X" SHALL BE AS NOTED ON PLANTING PLANS. DIMENSION FROM EDGES OF WALKS, CURBS, BUILDINGS, ETC., SHALL BE "X/2", UNLESS OTHERWISE NOTED ON PLANS.

PLANT SPACING (FEET ON CENTER)	AREA PER PLANT (SQUARE FEET)
X	SF
0.5'	0.215
1.0'	0.860
1.5'	1.935
2.0'	3.440
2.5'	5.375
3.0'	7.740
3.5'	10.535
4.0'	13.760
5.0'	21.500
6.0'	30.960

NO. PLANTS = AREA / AREA PER PLANT

14 TRIANGULAR PLANT SPACING

Plan
NTS



PLANTING NOTES
1. TREE SIZE – 3 INCH CALIPER MINIMUM MEASURED 6 INCHES UP FROM ROOT BALL, LARGER TREES ARE LESS LIKELY TO BE DAMAGED, INCREASING SURVIVABILITY.
2. PLANTER DIMENSION (4'–8") VARIES BY LOCATION AS DETERMINED BY RIGHT–OF–WAY PERMIT.
3. ROOT BARRIER SHALL BE 24" DEEP, 2MM (.08") THICK, 1/2" ABOVE THE SOIL ELEVATION. WITH JOINTS OVERLAPPING 6". ROOT BARRIER SHALL BE INSTALLED ON ALL SIDES OF PLANTER.
4. FOR APPROVED DOWNTOWN TREE SPECIES SEE DETAIL 708A–E, FOR TREES OUTSIDE OF DOWNTOWN SEE DETAIL 708F.
5. DO NOT USE TREE TRUNK TO LIFT TREE. IF THE INSPECTOR DETERMINES THAT THE TREE'S ABILITY TO SURVIVE HAS BEEN COMPROMISED, THAT TREE WILL BE REJECTED PRIOR TO PLANTING.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.
Street Tree Planting
DRAWING NO. 707
APPROVED
CITY ENGINEER DATE
NO. REVISIONS DATE BY

15 CITY STANDARD STREET TREE PLANTING

Section
SCALE: NTS

LANDSCAPE ARCHITECTS PC
lango . hansen
1100 nw gilsan #3B portland OR 97209 T 503 295.2437

REGISTERED 345 Kurt Lango OREGON 3/20/96 LANDSCAPE ARCHITECT

WICHITA PARK

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT
CITY OF MILWAUKIE

BID SET

LANDSCAPE DETAILS

REVISIONS

SCALE	AS NOTED
DRAWN BY	KF, BM
DATE	03.01.18
PROJECT NO.	1723

SHEET
L6.4