

KITSAP COUNTY

**FORMAL BID
2016-116**



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**ADVERTISEMENT FOR BIDS KITSAP COUNTY
FORMAL BID # 2016-116**

South Kitsap Regional Park: Phase 1C

BID SUBMISSION TIME & LOCATION:

THURSDAY MAY 12, 2016 3:00PM

Mailing Address:
614 Division Street MS-07
Port Orchard, WA, 98366

Physical Address:
4th Floor Administration Building
619 Division Street
Port Orchard, WA 98366

BID OPENING TIME & LOCATION:

THURSDAY MAY 12, 2016 3:15PM

Port Madison Conference Room,
4th Floor
Administration Building
619 Division Street
Port Orchard, W A

ENGINEER'S ESTIMATE:

\$347,000

NOTICE IS HEREBY GIVEN: Sealed Bids for the Project designated above will be received by Kitsap County Purchasing Office before the day and time indicated. Bids will be received in the Kitsap County Purchasing Office. Bids will be publicly opened and read aloud in the 4th Floor Port Madison Conference room of the Kitsap County Administration Building, 619 Division Street, Port Orchard, Washington at 3:15 PM. After the review process has been completed, a bid tabulation will be available for public inspection.

Prospective Bidders are hereby notified that they are solely responsible for ensuring timely delivery of their Bid to the Kitsap County Purchasing Office on or before the bid opening date and time.

All Bids shall be accompanied by a Bid Proposal deposit in certified check, or cashier's check, made payable to Kitsap County Treasurer, or surety bond in an amount equal to five percent (5%) of the amount of such Bid Proposal. Should the successful Bidder fail to enter into such Contract and furnish satisfactory performance bond at contract signing the Bid Proposal deposit shall be forfeited to Kitsap County.

Each bid proposal shall be completely sealed in a separate envelope, properly addressed as stated above, with the name and address of the bidder and the name of

the project plainly written on the outside of the envelope. A complete bid proposal shall include the following:

1. Bid Form
2. Bid Guarantee
3. Non-Collusion Affidavit
4. Performance Bond (For review only)
5. Contract (For review only)

All of the above items must be complete in all respects, including signatures (notarized where required). Bidder shall acknowledge receipt of all addenda in the spaces provided. The successful Bidder will be required to submit a photocopy of their current Washington State Contractor's Registration. Failure to include all items may be cause for the Bid to be rejected as non-responsive.

Bids are likely to be rejected if the lowest responsive Bid received exceeds the Engineer's estimate by an unreasonable amount. In the event all Bids are rejected for this reason, this Project may be deferred for re-advertising for bids until a more competitive situation exists.

DESCRIPTION OF WORK:

All work shall be in accordance with plans, specifications, and other contract documents as administered by Kitsap County.

Kitsap County reserves the right to reject any and all bids and to waive informalities or irregularities.

Bids received after MAY 12, 2016 3:00 PM will not be considered.

PART 1 - GENERAL

GENERAL PROVISIONS

ADVERTISEMENT FOR BIDS

The Advertisement for Bids bund herewith is incorporated by the reference as a part of these instructions, including the following:

- A. The Kitsap County Purchasing Office will receive sealed proposals for the South Kitsap Regional Park: Phase 1C. Bids must be received in the Purchasing Office located in the Kitsap County Administration Building 619 Division St., Port Orchard, WA 98366. Bids received after the above stated date and time will not be considered. After the review process, a bid tabulation will be available to the public.
- B. A surety company bid bond on approved forms, a cashier's check or a certified check payable to Kitsap County, shall accompany each bid in an amount not less than five percent (5%) of the Basic Bid. Should the successful bidder fail to enter into a contract in accordance with the bid, and furnish all documents and bonds required within the time stated in the specifications, the bid deposit or bond shall be forfeited to Kitsap County.

Kitsap County hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to the advertisement, Women and Minority Business Enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, or national origin in consideration for an award. Minority Business Enterprises will be required to meet all requirements of law as related to Public Works contracts, including the provision of the Equal Employment Opportunity and Affirmative Action Plan on the basis of any other bidder.

Kitsap County reserves the right to reject any and all bids and to waive informalities or irregularities.

END OF SECTION 00100

PART 1 - GENERAL

1.01 - ADVERTISEMENT FOR BIDS

The Advertisement for Bids bound herewith is incorporated by this reference as a part of these Instructions, including the following:

1.02 INSTRUCTIONS TO BIDDERS

A. Bids may be rejected by the County as irregular if not made in accordance with these instructions, including the following:

1. Bids shall be made on a form identical to that bound herein.
2. Numbers shall be shown in both words and figures. In case of conflict, words shall govern.
3. The Form of Bid Proposal shall not be altered by interlineations, erasures or by any other method whatsoever.
4. The Bidder shall bid on all alternate bids as they are fully considered in making award. If a bidder fails to bid an alternate, or if he or she notes "no bid," it will be construed as meaning that there will be no change in the contract amount and that the alternate is included in the contract amount.
5. Each bid must be signed in longhand using indelible ink by an authorized representative of the bidder with the representative's usual signature and title. Bids by partnerships must be signed with the partnership name by at least one of the partners. Bids by corporations must be signed with the legal name of the corporation, followed by the signature of the president, secretary or other person authorized to bind the corporation in the matter; indicating the state of incorporation and whether or not the corporation is authorized to do business in the State of Washington. Type or print the name of each signatory below the signature of that corporation's representative. Where dealing under an assumed name, a certified copy of a duly filed Certificate of Assumed Name shall accompany the proposal.
6. Enclose the bid and bid guarantee deposit or a bond in the envelope provided in bid package showing title of the work (Kitsap County and the names of the bidder, and address it to:

MAIL:
Kitsap County Purchasing Office
614 Division Street MS-07
Port Orchard, WA 98366

HAND DELIVER:
Kitsap County Purchasing Office
619 Division Street
Port Orchard, WA 98366

1.03 ADDENDA

Where appropriate, responses to questions, inquiries or requests for additional information or for substitution of proposed material will be issued in the form of Addenda, and copies of each addendum will be issued to all prospective bidders of record. Additionally, addenda are on file at the Kitsap County Purchasing Office. During the bidding period, prospective bidders will be advised by Addendum of additions to, deletions from or changes in the requirements of the contract documents. Kitsap County will not be responsible for the authenticity or correctness of oral interpretations of contract documents or for information obtained in any other manner

than through the media of Addenda. Bidders shall acknowledge receipt of Addendum in their bid proposals and each Addendum shall be considered a part of the Contract Documents. Failure to acknowledge receipt of any Addenda issued will invalidate a proposal as incomplete.

1.04 QUALIFICATION OF BIDDERS

- A. Apparent low bidder will be required to furnish evidence of experience, personnel, equipment, financial resources, performance record and such other evidence as may be requested in order to evaluate the bidder's capability to perform the work.
- B. If two or more prospective bidders desire to bid jointly as a Joint Venture on a single contract, each must be deemed qualified, as provided above, and they must also include with the bid proposal packet an agreement to Joint Venture. The Joint Venture is then treated as a new firm and qualified as such. However, this Joint Venture and any of its members are subject to the conditions as stated elsewhere within these specifications. Any agreement to Joint Venture required to be filed shall be signed by each of the bidders and must specify each individual who is authorized to execute proposals, contracts, bond and other documents on behalf of the Joint Venture. If any of the bidders is a corporation, the agreement must be accompanied by a resolution of the corporation authorizing such Joint Venture agreement and designating the officer(s) authorized to sign such Joint Venture agreement or contract on behalf of such corporation.
- C. Kitsap County may reject the bid if the County feels rejection is justified because of unsatisfactory performance on a prior or current contract.

1.05 IRREGULAR PROPOSALS

- A. A bid may be considered irregular and may be rejected by the County for any of the following reasons, among others:
 - 1. If the bid proposal form furnished or authorized is either not used or is materially altered;
 - 2. If the bid proposal form as completed contains any additions, deletions, unauthorized alternate bids, or conditions;
 - 3. If the bidder adds any provisions reserving the right to reject or accept the award, or enter into the contract;
 - 4. If the bid is not properly executed;
 - 5. If the bidder is not qualified.
- B. The bid may be considered irregular and may be rejected by the County for any of the following reasons:
 - 1. If the bid fails to include a unit price for every bid item;
 - 2. If the County, for good cause, deems the bid bond inadequate or improper;
 - 3. If receipt of addenda is not acknowledged;
 - 4. If one partner of a joint venture and the joint venture Submit a bid for the same project.

1.06 DISQUALIFICATION OF BIDDERS

- A. The County, in its discretion, may determine that a bidder is not responsible and reject the bid proposal for any of the following reasons:
1. If mandatory not attending the pre-bid conference.
 2. More than one bid proposal on the same project from a bidder under the same or different names;
 3. Evidence of collusion with any other bidder(s). Participants in such collusion may be disqualified from submitting bids on any further work;
 4. Unsatisfactory performance records, judged from the standpoint of conduct of work, workmanship, or progress, as shown by past or current work for the County, or other entities;
 5. If the bidder has previously defaulted in the performance of or failed to complete a written public contract, or has been convicted of a crime arising from previous public contract;
 6. A bidder, by law, not authorized to do business in the State of Washington pursuant to RCW 39.06.010.
 7. **Pursuant to Title 39 of the RCW the bidder is required to submit, within one (1) hour of submission of the bid, a list of subcontractors whose contract amount is equal to or greater than 10% of the total contract amount. If the bidder does not submit the names within the one (1) hour time period, the bid must be treated as non-responsive and void.** List of subcontractors can be faxed to the Kitsap county Purchasing Office. Fax number is 360-337-4638.

1.7 OPENING OF BIDS

Bids received prior to the time of opening will be kept unopened and secured until the time of the bid opening as specified in Section 00100. No bid received thereafter will be considered. No responsibility will attach, and bidders waive any and all complaints against the County for premature opening of an improperly addressed or identified bid.

At the time and place fixed for the opening of bids, every bid received within appropriate time will be opened and publicly read aloud.

1.08 WITHDRAWAL OF BIDS

The bidder has no right to withdraw or modify the bid for any reason whatsoever after the time set for the opening thereof, unless the award of the contract is delayed for a period exceeding sixty (60) days from the time set for opening of the bids.

Prior to the time set for opening of bids, a bidder may withdraw or revise his bid proposal, provided that an individual authorized to sign proposals files the request for withdrawal or revision with the County Purchasing Office in writing. The original proposal, as modified in writing by an attached revision filed before the time set for opening of bids will be considered as the bid proposal by the bidder.

1.09 MODIFICATIONS

No oral, fax, telephone, or telegraphic bids or modifications will be considered or accepted.

1.10 . WASHINGTON STATE SALES TAX

Washington State Sales Tax on the Contract value is not to be included in the bid proposal. A proportionate amount of such tax will be added to each progress payment. All other applicable taxes & fees must be included in the basic bid amount.

1.11 FEDERAL EXCISE TAXES

Kitsap County is an arm and agency of the State of Washington and is exempt from payment of Federal retailer and manufacturers excise tax (Section 4055, Chapter 31, and Section 4224, Chapter 32, Internal Revenue Code of 1954) and the proposals are not to include such taxes.

1.12 STATE LAW

Applicable state laws concerning prevailing wages, hours, worker's compensation and other conditions of employment are called to the attention of the bidders for their compliance. All filing fees or permit fees required for completion of the work are to be included in the bid.

1.13 BID GUARANTEE

The bid guarantee shall be a cashier's check or a certified check, or a bid bond of a surety company licensed to do business in the State of Washington.

Should a bidder fail to enter into a contract and furnish the required bonds within seven (7) days after the proposal has been accepted, the bid bond may be retained by the County as liquidated damages, not as a penalty.

Bid bonds and checks will be returned to all except the three lowest bidders within seven (7) days after the bid award. Bid bonds or checks of each of the three lowest bidders will be returned within three (3) days after execution of the Contract, and after the execution of the Contract, and after the executed bonds have been approved by Kitsap County.

1.14 BIDDER'S RESPONSIBILITIES

The submission of a bid shall be conclusive evidence that a bidder has made sufficient examination and has investigated and is satisfied as to the conditions to be encountered, the character, quantity, quality and scope of work, the quantities and qualities of materials to be supplied and equipment and labor to be used, and the requirements of the contract and proposal submitted, including all addenda for performance of the work.

The bidder must be familiar with all state, federal and local laws, ordinances and regulations which in any manner might affect those engaged or Employed in the work, the materials, equipment or procedures used in the work, or which in any other way

might affect the conduct of the work. He/She is assumed to be familiar with such laws and regulations, and no plea of misunderstanding or ignorance of the law will be considered.

The bidder shall determine from careful examination the methods; materials, labor and equipment required to perform the work in full and shall reflect the same in his bid price. If, during the performance of the work, methods, materials, labor or equipment required are beyond those anticipated by the bidder, he will not be entitled to additional compensation except as may be provided for elsewhere in these specifications.

1.15 DISCREPANCIES

Should a bidder find discrepancies in, or omissions from, the drawings or specifications, or should the bidder be in doubt as to their meaning, the bidder shall at once notify the Architect or Construction Manager. If appropriate, the Architect or Construction Manager will send a written instruction to all bidders in the form of an Addendum. Neither the County nor the Architect may be held responsible for any oral instruction. Questions received by the Architect less than seventy-two (72) hours before bids close may not be answered. All addenda issued prior to the time of bid closing are incorporated into the contract.

1.16 REQUEST FOR CLARIFICATIONS AND DISCREPANCIES

Should a bidder have a Request for Clarification or find discrepancies, ambiguities or omissions in the drawings or specifications, or should a bidder be in doubt as to their meaning, bidder should notify Colby Wattling, in writing, via FAX. (360) 337-4638.

Interpretations, corrections and changes of the Bidding documents will be made by addendum only through the Kitsap County Purchasing Office. Interpretations, corrections and changes in the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

If there are any questions regarding the Kitsap County bidding process please contact Colby Wattling, Buyer, at 360-337-4638, Fax 360-337-4638, or email cwattling@co.kitsap.wa.us. Should there be any technical questions, please contact Ric Catron, Parks Project Coordinator at rcatron@co.kitsap.wa.us for Contract Terms and Conditions questions. **UNDER NO CIRCUMSTANCES SHALL THE COUNTY, OR CONSULTANTS BE CONTACTED BY ANY SUBCONTRACTOR OR SUPPLIER.**

Any Variances to specifications and contract documents shall not be accepted unless agreed to by the County, and Architect in writing.

Substitutions will not be considered unless submitted and agreed to prior to award of contract.

1.17 ACCEPTANCE OF BID (AWARD)

It is the intent of the County to award a Contract to the lowest, responsive bidder provided the Bid has been submitted in accordance with the requirements of the Bidding documents. The County shall have the right to waive informalities or

irregularities in bid received and to accept the bid which, in the County's judgment, is in the County's and project' own best interest. The COUNTY may reject any bid for a failure to agree to the proposed schedule for contract performance.

The County shall have the right to accept alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low bidder on the basis of the sum of the Base Bid and any Alternate's accepted.

The County retains the right to accept offered bids for 60 days following receipt of bids. If a longer duration is required the County retains the right to request the apparent low bidder to extend the award period or adjust their price accordingly. If an adjustment is requested, the County reserves the right to request the same adjustment from other bidders.

The County may reject all bids if they exceed budgeted cost or the County may negotiate bid pricing with the apparent low responsive bidder including changes in the contract plans and specifications, to bring the bid within budgeted cost (RCW 39.10.080).

1.18 SITE VISIT

Contractors who submit a bid certify that they have visited the jobsite and are completely familiar with the existing conditions, concurrently scheduled construction, access, staging and site limitations, and have made allowances for those conditions in their bid.

1.19 TIME OF COMPLETION:

The work of this project shall be completed within the time period established in the contract documents, from the date of Notice to Proceed. The project must be completed by no later than 120 days from Notice to Proceed.

1.20 NOTICE TO PROCEED

The County will issue a Notice to proceed upon receipt in proper form and approval of the required contract, bonds, certificates and other required submittals. No proposal is binding upon the County until the Board of County Commissioners duly executes the contract. No work shall be performed within the project limits prior to the receipt of the Notice to Proceed, and any work performed outside such area or materials ordered prior to the receipt of the Notice to Proceed shall be at the sole risk of the Contractor.

1.21 SUMMARY OF BID DOCUMENTATION

IT IS MANDATORY THAT EACH BIDDER COMPLETE AND SUBMIT WITH ITS BID DOCUMENTATION REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

<u>Item</u>	<u>No. of Pages</u>
Proposal Form	Three (3) pages
Bid Guarantee	One (1) page

***Pursuant to Title 39 of the RCW the bidder is required to submit within one (1) hour of submission of the bid a list of the subcontractors whose subcontract amount is equal to or greater than 10% of the total contract amount. If the bidder does not submit the names within the one (1) hour time period, the bid must be treated as non-responsive and void.**

List of subcontractors can be faxed to the Kitsap County Purchasing Department. Fax number is 360-337-4638

END OF SECTION 00200

INSTRUCTIONS TO BIDDERS

PROPOSAL FOR PROJECT

TO: Kitsap County Board of Commissioners
614 Division Street MS-4
Port Orchard, WA 98366

Board of Commissioners:

The undersigned bidder agrees, if this bid is accepted, to enter into a contract with owner, in the form included in the specifications to perform and furnish the work as specified or indicated in the bidding documents for the bid price and within the bid times indicated in this bid and in accordance with the other terms and conditions of the contract documents.

In submitting this bid, bidder represents, as more fully set forth in the contract, that:

1. This bid will remain subject to acceptance for 60 days after the day of bid opening;
2. The owner has the right to reject this bid;
3. Bidder will sign and submit the contract with the bonds and other documents required by the bidding requirements within 10 days after the date of owner's Notice of Award;
4. Bidder has examined copies of all the bidding documents;
5. Bidder has visited the site and become familiar with the general, local and site conditions;
6. Bidder is familiar with federal, state, and local laws and regulations;
7. Bidder has correlated the information known to bidder, information and observations obtained from visits to the site, reports and drawings identified in the bidding documents and additional examinations, investigations, explorations, tests, studies, and data with the bidding documents;
8. Bidder agrees that the work will be substantially complete and final completion in accordance with the general conditions.

Bidder has received the following addenda, receipt of which is hereby acknowledged:

DATE	NUMBER
_____	_____
_____	_____
_____	_____
_____	_____

BASIC BID:

Pursuant to and in compliance with the advertisement for bids and instructions to bidders the undersigned hereby certifies having carefully examined contract documents entitled:

South Kitsap Regional Park: Phase 1C

and conditions affecting the work, and is familiar with the site; and having made the necessary examinations, here proposes to furnish all labor, materials, equipment, and services necessary to complete the work in strict accordance with the above named documents for the stipulated lump sum of:

Base Bid: _____ Dollars (\$ _____).

The above sum is hereby designated as the basic bid. The basic bid does not include Washington State and/or local sales taxes on the contract value.

CONTRACT AND BOND:

If notified of the acceptance of this bid within sixty (60) days of the time set for opening of bids, the undersigned agrees to execute a contract for the above work, for a compensation computed from the above-stated sums, on the Contract Form bound with the specifications and to furnish a bond as required by the specifications on the form bound therein.

BID GUARANTEE:

It is agreed that if the undersigned fails to execute said Contract and furnish said Bond within seven (7) days after written notice of award of Contract, then the Bid Guarantee shall be retained by the County as liquidated damages. If this bid is not accepted within sixty (60) days after the time set for the opening of bids, or if the undersigned delivers said Contract and Bond in a timely manner, then the check or cash shall be returned, or the Bid Bond shall become void.

SIGNATURE

Signed By: _____ Date _____

Please Print Name: _____

Title: _____

Name of Firm: _____

Address: _____

Telephone: (_____) _____

SUBCONTRACTOR LIST

Each Bidder is advised of the requirements of Washington Law, RCW 39.30.060. Pursuant to Title 39 of the Revised Code of Washington requires each bidder to submit as part of the bid, or within one hour after the published bid submittal time, a list of the subcontractors whose subcontract amount is equal to or greater than 10% of the total contract amount including the name of subcontractors with whom the bidder, if awarded the contract, will subcontract for performance of the work of heating, ventilation and air conditioning, plumbing as described in RCW 18.106 and electrical as described in RCW 19.28 or to name itself for the work. Failure to do so will render the bid non-responsive and therefore void.

The Bidder shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the bidder must indicate which subcontractor will be used for which alternate. Failure of the bidder to submit as part of the bid the names of such subcontractors or to name itself to perform such work or the naming of two or more subcontractors to perform the same work shall render the bidder's bid non-responsive and, therefore, void.

Please list your subcontractors appropriately.

SKATE PARK

Subcontractor Name: _____

LANDSCAPING

Subcontractor Name: _____

EARTHWORK

Subcontractor Name: _____

OTHER SUBCONTRACTORS _____

(Equal to or Greater than 10%)

TRENCH SAFETY: Pursuant to and in compliance with RCW 39.04.180 the undersigned hereby agrees to provide trench safety for all excavations required for this project for the stipulated lump sum of:

_____ Dollars (\$_____).

The above sum will be added to the Basic Bid above by the Owner for the purposes of evaluation of Low Bidder and will be added to the Basic Bid to help determine the Contract Amount. The trench safety sum does not include Washington State and /or local sales taxes on the Contract value.

STATEMENT OF BIDDER'S QUALIFICATIONS

Name of Firm: _____

Address: _____

Telephone No.: (_____) _____

Contact Person for this Project: _____

Number of years the Contractor has been engaged in the construction business under the present firm name, as indicated above:

List of five major projects including a minimum of three skate parks of a similar nature which have been completed by the Contractor within the last ten years and the gross dollar amount of each project:

Project Name	Amount	Owner	Phone #
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List major pieces of equipment which are anticipated to be used on this project by the Contractor and note which items are owned by the Contractor and which are to be leased or rented from others:

Have you changed bonding companies within the last three years? If yes, state reason (optional).

Have you ever been sued by the client or have you ever sued the client on any public works contract for a special district, municipality, county or state government?

For what reason? _____

Disposition of case, if settled _____

Do you have any outstanding payments due to the Department of Revenue?

Proposer agrees that the County shall retain the right to obtain any and all credit reports?

(_____) _____

Yes Signature

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as
Principal and, a corporation, organized and existing under and by virtue of the laws of the State of
_____ and legally doing business in the State of Washington, as Surety, are held
and firmly bound and obligated unto the State of Washington, in the full and just sum of _____
_____ Dollars, lawful money of the United States, for the payment of which sum well and truly to
be made, we do bind ourselves, and each of our heirs, executors and administrators, successors
and assigned, jointly and severally, firmly by these presents.

This bond is executed in pursuance of Chapter 39.08, Revised Code of Washington.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that whereas the Principal entered into a
certain contract with, dated the day of _____, 2016.

NOW THEREFORE, if the Principal shall faithfully perform all the provisions of such contract and
pay all laborers, mechanics and subcontractors and materialmen, and all persons who shall supply
such persons or subcontractors, with provisions and supplies for the carrying on of such work, then
this obligation is void; otherwise to remain in full force and effect. Provided, however, that the
conditions of this obligation shall not apply to any money loaned or advanced to the Principal or to
any subcontractor or other person in the performance of any such work.

Signed and sealed this _____ day of, _____ 2016.

Countersigned:

_____ (Seal)

Approved as to Form:

By: _____
_____ Attorney in Fact

SUBSTANTIAL COMPLETION CERTIFICATE

PROJECT: ARCHITECT:
ARCHITECT'S PROJECT NO:

TO: CONTRACTOR:
CONTRACT FOR:

DATE OF ISSUANCE: CONTRACT DATE:

PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

The work performed under this Contract has been reviewed and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby established as **September 30, 2016**, which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below or in the Contract Documents.

DEFINITION OF DATE OF SUBSTANTIAL COMPLETION:

The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the County can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A list of items to be completed or corrected, prepared by the Contractor and verified and amended by the Architect is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The date of commencement of warranties for items on the attached list will be the date of final payment unless otherwise agreed to in writing.

PROJECT MANAGER

By: _____

Date: _____

The Contractor will complete or correct the Work on the list of items attached hereto within **21** days from the above Date of Substantial Completion.

CONTRACTOR

By: _____

Date: _____

The County accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at _____ (time) on, 2016.

COUNTY

By: _____

Date: _____

SIGNATURE

Signed By: _____ Date _____

Please Print Name: _____

Title: _____

Name of Firm: _____

Address: _____

Telephone: (_____) _____

CAPITAL PROJECT CONTRACT

THIS CONTRACT is entered into in duplicate originals between the COUNTY OF KITSAP, a municipal corporation, with its principal offices at 614 Division Street, Port Orchard, Washington 98366, hereinafter called the OWNER, and , located at , hereinafter the CONTRACTOR.

In consideration of the mutual benefits and covenants contained herein, the parties agree as follows:

SECTION 1. DURATION OF CONTRACT

- a. The term of this Contract shall commence upon the effective date set forth below. The CONTRACTOR shall substantially complete all Work required under this Contract by **September 30, 2016**. Final completion and closeout of this Contract shall occur 21 calendar days after timely substantial completion, except as provided in Section 10 below. Time is of the essence in the performance of this Contract.
- b. The term "Substantial Completion" as used in this Contract means that stage in the progress of the Work where the OWNER has full and unrestricted use and benefit of the facilities for the purposes intended and only minor incidental work, replacement of temporary substitute facilities or minor correction or repair remains to physically complete the total contract. The term "Notice to Proceed" means a written notice from the OWNER to the CONTRACTOR that defines the date on which the Work under the Contract is to start.

SECTION 2 DESCRIPTION OF THE WORK

- a. The CONTRACTOR shall do all Work necessary to complete The Work shall consist of:
- b. The CONTRACTOR shall do all Work and furnish and pay for all materials, equipment, and labor in accordance with the attached Project Documents, including, but not limited to, any drawings, specifications, addenda thereto, and all terms and conditions contained in the Call for Bids, Instructions to Bidders and Bid documents. Specific items considered to be Project Documents and project drawings listed herein, which Project Documents are incorporated herein by reference. Further, the CONTRACTOR shall perform any alterations in or additions to the Work covered by this Contract and any extra Work which may be ordered as provided for in this Contract if requested to do so by the OWNER pursuant to Section 16.
- c. The CONTRACTOR shall perform according to standard industry practice for the requested Work specified in this Contract.
- d. The CONTRACTOR shall complete its Work in a timely manner and in accordance with the agreed schedule submitted by the CONTRACTOR and approved by the OWNER.

- e. The CONTRACTOR shall, from time to time, during the progress of the Work, confer with the OWNER. The CONTRACTOR shall prepare and present status reports and other information that may be pertinent and necessary, or as may be requested by the OWNER.

SECTION 3. CONTRACT REPRESENTATIVES

- a. Each party to this Contract shall have a representative. Each party may change its representative upon providing written notice to the other party. The parties' representatives are as follows:

For CONTRACTOR:	FOR OWNER:
Name of Representative	James R. Dunwiddie
Title	Director
Mailing Address	Kitsap County Parks
City, State and Zip Code	614 Division, MS#1
Telephone Number	Port Orchard, WA 98366
Fax Number	360-337-5385
E-mail Address	parks@co.kitsap.wa.us

- b. All instructions, modifications, and changes to the Contract shall be conveyed to the CONTRACTOR through the OWNER'S REPRESENTATIVE. Any work executed upon the direction of any person or entity other than the OWNER'S REPRESENTATIVE may be considered defective and will be performed without reimbursement for said work to the CONTRACTOR. The OWNER'S REPRESENTATIVE shall have the authority to reject any and all nonconforming or defective work under the Project Documents.

SECTION 4. CONTRACT AMOUNT

The OWNER hereby agrees to pay the CONTRACTOR according to the CONTRACTOR's Bid in the amount of (including accepted alternates and excluding Washington State Sales Tax (WSST)), at the time and manner and upon the conditions provided for in this Contract.

SECTION 5. NOTICE TO PROCEED

The COUNTY shall issue a Notice to Proceed after the execution of the Contract and receipt of all necessary required documents, including, where applicable, Performance and Payment Bond (or 50% letter if contract amount, including WSST, is \$25,000 or less), a copy of insurance policies and/or any and all Certificates of Insurance and Additional Insured Endorsements. The Notice to Proceed shall provide the Start Date.

SECTION 6. PREVAILING WAGES

Pursuant to RCW Chapter 39.12 and WAC 296-127, the CONTRACTOR shall pay not less than the prevailing rate of per diem wages to its employees and provide documentation to the OWNER of its compliance with prevailing wage laws and regulations. A copy of such prevailing rates of per diem wages shall be posted by the CONTRACTOR at the Work site. The CONTRACTOR must submit a Statement of Intent to Pay Prevailing Wages to the State Department of Labor and Industries for approval. Copies of an approved "Statement of Intent" shall be provided to the OWNER prior to any payment being made to the CONTRACTOR. An "Affidavit of Wages Paid" must be submitted to and approved by the State Department of Labor and Industries by

the CONTRACTOR prior to release of the retained percentage. Copies of these documents shall be sent to the OWNER. The fee for each of these documents shall be paid by the CONTRACTOR.

SECTION 7. PAYMENT

- a. At least ten (10) calendar days before the first Application for Payment, the CONTRACTOR shall submit to the OWNER'S REPRESENTATIVE a Schedule of Values which allocates the total cost of the project to various categories. This schedule, unless returned for revision by the OWNER'S REPRESENTATIVE, shall be used as the OWNER'S REPRESENTATIVE'S basis for reviewing the CONTRACTOR'S Applications for Payment. For contracts using unit pricing, the unit pricing schedule provided in the CONTRACTOR'S bid shall be used by the OWNER'S REPRESENTATIVE as the basis for reviewing the CONTRACTOR'S Applications for Payment.
- b. At monthly intervals, unless determined otherwise by the OWNER, the CONTRACTOR shall submit to the OWNER an Application for Payment. An Application for Payment is a written request submitted by the CONTRACTOR to the OWNER for payment of Work. The Application shall be submitted on a form reviewed and approved by the OWNER'S REPRESENTATIVE. Within thirty (30) calendar days of receiving an Application for Payment, the OWNER shall pay ninety-five (95) percent of the Application for Payment if such Application is acceptable to the OWNER. Five (5) percent of the Application for Payment amount shall be retained in accordance with RCW Chapter 60.28. No Application for Payment will be considered until all schedules have been met and other documentation required by the Project Documents have been submitted.
- c. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payment may be similarly made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored off site shall be conditioned upon compliance by the CONTRACTOR with procedures satisfactory to the OWNER to establish the OWNER's title to such material and equipment or otherwise protect the OWNER's interest.
- d. No certificate given or payment made shall be evidence of the performance of the Contract, either wholly or in part, against the claim of the OWNER to the contrary, and no payment will be construed to be an acceptance of any defective Work which may before or afterward appear.
- e. Neither OWNER nor OWNER'S REPRESENTATIVE shall have an obligation to pay or to see the payment of money to a subcontractor except as may otherwise be required by law.

SECTION 8. PERFORMANCE AND PAYMENT BOND

Pursuant to RCW Chapter 39.08, the CONTRACTOR shall make, execute, and deliver to the OWNER a performance and payment bond for the contract amount of \$ (including WSST). This bond shall also cover all approved change orders. The bond must be submitted within ten (10) days after notice of the award, exclusive of the day of notice. If the bidder to whom the contract is awarded fails to enter into the contract and

provide the performance bond as required the amount of the bid deposit will be forfeited to the county and the contract awarded to the next lowest and best bidder.

SECTION 9. FINAL COMPLETION AND FINAL PAYMENT

- a. Upon receipt of a final Application for Payment, the OWNER'S REPRESENTATIVE will promptly make a final inspection and, when the OWNER'S REPRESENTATIVE finds the Work acceptable under the Project Documents and the Contract fully performed, the OWNER will promptly issue final payment pursuant to Paragraph 7.
- b. Before final payment, the CONTRACTOR shall furnish to OWNER or the OWNER'S REPRESENTATIVE, in addition to the other documents required by the Contract, record drawings of changes from the construction drawings showing deviations in a manner requested by the OWNER or the OWNER'S REPRESENTATIVE, and originals of all warranties for such equipment and materials where warranties are specified in the Contract.

SECTION 10. RETAINED PERCENTAGE

- a. In accordance with RCW Chapter 60.28, the OWNER shall release any retained percentage withheld in the manner set forth in Section 7.b., if after sixty (60) calendar days of final completion and acceptance of all contract Work, no liens or claims are filed against the project, and after receipt of the Department of Revenue's Certificate designating taxes due or to become due are discharged and receipt of by the OWNER of an "Affidavit of Wages Paid" from L&I. The provisions of this paragraph shall supersede any other conflicting provisions.

SECTION 11. HOLD HARMLESS AND INDEMNIFICATION

- a. The CONTRACTOR shall hold harmless, indemnify and defend the OWNER, its officers, officials, employees and agents, from and against any and all claims, actions, suits, liability, loss, expenses, damages, and judgments of any nature whatsoever, including, but not limited to, reasonable costs and attorneys' fees in defense thereof, for injury, sickness, disability or death to persons or damage to property or business, caused by or arising out of the performance of the services rendered under this contract by the CONTRACTOR, its employees, agents, or subcontractors or anyone for whose acts any of them may be liable. PROVIDED HOWEVER, that the CONTRACTOR'S obligation hereunder shall not extend to injury, sickness, death or damage caused by or arising out of the sole negligence of the OWNER, its officers, officials, employees or agents. PROVIDED FURTHER, that in the event of the concurrent negligence of the parties, the CONTRACTOR'S obligations hereunder shall apply only to the percentage of fault attributable to the CONTRACTOR, its employees, agents, or subcontractors.
- b. In any and all claims against the OWNER, its officers, officials, employees and agents by any employee of the CONTRACTOR, subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or subcontractor under Workers Compensation acts, disability benefit acts, or other employee benefit acts, it being clearly agreed and understood by the parties hereto that the CONTRACTOR expressly waives any immunity the CONTRACTOR might have had under such laws. By executing the Contract, the CONTRACTOR acknowledges that the

foregoing waiver has been mutually negotiated by the parties and that the provisions of this Section shall be incorporated, as relevant, into any contract the CONTRACTOR makes with any subcontractor or agent performing Work hereunder.

- c. The CONTRACTOR'S obligations hereunder shall include, but are not limited to, investigating, adjusting and defending all claims alleging loss from action, error or omission, or breach of any common law, statutory or other delegated duty by the CONTRACTOR, the CONTRACTOR'S employees, agents or subcontractors.

SECTION 12. INSURANCE

- a. **Workers' Compensation and Employer's Liability:** The CONTRACTOR shall maintain workers' compensation insurance as required by Title 51, RCW, and shall provide evidence of coverage to the OWNER. If this contract is over \$50,000, then the CONTRACTOR shall also maintain Employees Liability Coverage with a limit of not less than \$1 million.
- b. **Commercial General Liability:** The CONTRACTOR shall maintain Commercial General Liability coverage for bodily injury, personal injury, and property damage, subject to limits of not less than Two Million Dollars (\$2,000,000.00) per loss. The general aggregate limit shall apply separately to this Contract and be no less than Five Million Dollars (\$5,000,000.00).

The CONTRACTOR will provide Commercial General Liability coverage which does not exclude any activity to be performed in fulfillment of this Contract. Specialized forms specific to the industry of the CONTRACTOR will be deemed equivalent provided coverage is no more restrictive than would be provided under a standard Commercial General Liability policy, including contractual liability coverage. Coverage shall include liability arising out of activities performed by or on behalf of the CONTRACTOR; products and completed operations of the CONTRACTOR; or premises owned, leased, or used by the CONTRACTOR.

- c. **Automobile Liability:** The CONTRACTOR shall maintain Business Automobile Liability insurance or equivalent form with a limit of not less than \$1,000,000.00 each accident combined Bodily Injury and Property Damages and an aggregate limit of at least \$2,000,000.00. Coverage shall include owned, hired and non-owned automobiles.
- d. **Builders Risk:**
 - i. Contractor shall purchase and maintain, until final acceptance by the Owner, property insurance in the amount of the Contract Sum including all Change Orders for the Work on a replacement cost basis. The insurance shall cover the interest of Owner, Contractor, and any Subcontractors, as their interests may appear.
 - ii. Contractor property insurance shall be placed on an "all risk" basis and insure against the perils of fire and extended coverage and physical loss or damage including theft, vandalism, malicious mischief, collapse, false work, temporary buildings, debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for A/E's services and expenses required as a result of an insured loss.

- iii. Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E's sub consultants, separate contractors described in Section 5.20, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this section or other property insurance applicable to the work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

e. **Other Insurance Provisions**

- i. The CONTRACTOR'S liability insurance provisions shall be primary with respect to any insurance or self-insurance programs covering the OWNER, its elected and appointed officers, officials, employees and agents.
- ii. The CONTRACTOR'S Commercial General Liability insurance shall include the OWNER, its officers, officials, employees and agents as additional insured with respect to performance of services.
- iii. The CONTRACTOR'S Commercial General Liability insurance shall contain no special limitations on the scope of protection afforded to the OWNER as additional insured.
- iv. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the OWNER, its officers, officials, employees, or agents.
- v. The CONTRACTOR'S insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- vi. The CONTRACTOR shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.
- vii. The insurance limits mandated for any insurance coverage required by this Contract are not intended to be an indication of exposure nor are they limitations on indemnification.
- viii. The CONTRACTOR shall maintain all required policies in force from the time services commence until services are completed. Certificates, policies, and endorsements expiring before completion of services shall be promptly replaced as well as the verification sent to the OWNER.

- f. **Verification of Coverage and Acceptability of Insurers:** The CONTRACTOR shall place insurance with insurers licensed to do business in the State of

Washington and having A.M. Best Company ratings of no less than A:7 with the exception that excess and umbrella coverage used to meet the requirements for limits of liability or gaps in coverage need not be placed with insurers or re-insurers licensed in the State of Washington.

- i. The CONTRACTOR shall furnish the OWNER with properly executed certificates of insurance or a signed policy endorsement which shall clearly evidence all insurance required in this Section within ten (10) calendar days after the effective date of the contract. The certificate will at a minimum, list limits of liability and coverage. The certificate will provide that the underlying insurance contract will not be canceled, allowed to expire, or be materially reduced in coverage except on thirty (30) calendar days prior written notice to the OWNER. Any certificate or endorsement limiting or negating the insurer's obligation to notify the OWNER of cancellation or changes shall be altered so as not to negate the intent of this provision.
- ii. The CONTRACTOR shall furnish the OWNER with evidence that the additional insured provision required above has been met. Acceptable forms of evidence are the endorsement pages of the policy showing the OWNER as an additional insured or an Additional Insured Endorsement page.
- iii. Certificates of Insurance shall show the Certificate Holder as Kitsap County and include c/o of the Office or Department issuing the Contract. The address of the Certificate Holder shall be shown as the current address of the Office or Department.
- iv. The CONTRACTOR shall request that their Washington State Department of Labor and Industries, Workers Compensation Representative send written verification to Kitsap County that CONTRACTOR is currently paying Workers Compensation within ten (10) calendar days after the effective date of the Contract.
- v. Written notice of cancellation or change shall be mailed to the OWNER at the following address:

Attn: Risk Manager
Department of Administrative Services
614 Division Street
Port Orchard, Washington 98366
- vi. The CONTRACTOR or its broker shall provide a copy of any and all insurance policies specified in this Contract upon request of the Kitsap County Risk Manager.

SECTION 13. CONTRACTOR RESPONSIBILITY FOR WORK

- a. The CONTRACTOR shall supervise and direct all Work herein 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 herein.

- b. The CONTRACTOR shall be responsible to the OWNER for the acts and omissions of the CONTRACTOR'S employees, agents, subcontractors and their agents and employees, and any other person performing Work under a contract with the CONTRACTOR.

SECTION 14. WARRANTY

In addition to any special warranties provided elsewhere in the Project Documents, the CONTRACTOR warrants to the OWNER and OWNER'S REPRESENTATIVE that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Project Documents, and that the Work will conform with the requirements of the Project Documents as described herein. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and may be rejected. The CONTRACTOR'S warranty excludes remedy for damage caused by abuse, improper or insufficient maintenance, or improper operation. If required by the OWNER'S REPRESENTATIVE or OWNER, the CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment provided.

SECTION 15. SALES TAX AND OTHER FEES

The CONTRACTOR shall pay Washington State sales tax and any other tax, and shall secure and pay for permits as indicated in the general conditions.

SECTION 16. CHANGES

Changes to the contract shall be governed in accordance with Part 7, of the General Conditions for Kitsap County Facility Construction.

SECTION 17. CHANGE ORDER PRICING

- a. The value of any Work covered by Change Order, or of any request for an equitable adjustment in the Contract Amount, shall be determined by one or more of the following methods:
 - 1. Lump sum;
 - 2. Unit price; or
 - 3. Fixed or percentage fee.
- b. Charges for the Work covered by an approved change shall be submitted by the CONTRACTOR to the OWNER on breakdown sheets for change proposal submittal and the proposals shall be prepared in a manner consistent with the Project Documents.

SECTION 18. TERMINATION

- a. The OWNER may terminate this Contract in whole or in part whenever the OWNER determines, in its sole discretion that, such termination is in the best interests of the OWNER. The OWNER may terminate this Contract upon giving ten (10) calendar days written notice by Certified Mail to the CONTRACTOR. In that event, the OWNER shall pay the CONTRACTOR for all costs incurred by the CONTRACTOR in performing the Contract up to the date of such notice. Payment shall be made in accordance with Section 7 of this Contract.
- b. In the event that funding for this project is withdrawn, reduced or limited in any way after the effective date of this Contract, the OWNER may summarily terminate this

Contract notwithstanding any other termination provision of this Contract. Termination under this paragraph shall be effective upon the date specified in the written notice of termination sent by the OWNER to the CONTRACTOR. After the effective date, no charges incurred under this Contract are allowable.

- c. If the CONTRACTOR breaches any of its obligations hereunder, and fails to cure the breach within ten (10) calendar days of written notice to do so by the OWNER, the OWNER may terminate this Contract, in which case the OWNER shall pay the CONTRACTOR only for the costs of services accepted by the OWNER, in accordance with Section 7 of this Contract. Upon such termination, the OWNER, at its discretion, may obtain performance of the Work elsewhere or seek recourse against the performance and payment bond. The CONTRACTOR shall bear all costs and expenses incurred by the OWNER in completing the Work and all damage sustained by the OWNER by reason of the CONTRACTOR'S breach.

SECTION 19. NON-WAIVER OF RIGHTS

The parties agree that the excuse or forgiveness of performance, or waiver of any provisions of this Contract does not constitute a waiver of such provisions for future performance, or prejudice the right of the waiving party to enforce any of the provisions of this Contract at a later time.

SECTION 20. INDEPENDENT CONTRACTOR

- a. The CONTRACTOR shall perform this Contract as an Independent Contractor and not as an agent, employee or servant of the OWNER. The CONTRACTOR specifically has the right to direct and control CONTRACTOR'S own activities in providing the agreed services in accordance with the specifications set out in this Contract.
- b. The CONTRACTOR acknowledges that the Work performed under this Contract does not include any OWNER benefits, including, but not limited to: vacation pay, holiday pay, sick leave pay, medical, dental, or other insurance benefits, fringe benefits, or any other rights or privileges afforded to Kitsap County employees.
- c. The CONTRACTOR shall have and maintain complete responsibility and control over all of its subcontractors, employees, agents, and representatives. No subcontractor, employee, agent, or representative of the CONTRACTOR shall be or deem to be or act or purport to act as an employee, agent, or representative of the OWNER, unless otherwise directed by the terms of this Contract.
- d. The CONTRACTOR agrees to immediately remove any of its employees or agents from assignment to perform services under this Contract upon receipt of a written request to do so from the OWNER'S REPRESENTATIVE or designee.

SECTION 21. COMPLIANCE WITH LAWS

The CONTRACTOR shall comply with all applicable federal, state and local laws, rules and regulations in performing this Contract.

SECTION 22. NONDISCRIMINATION

The CONTRACTOR, its assignees, delegates, or subcontractors shall not discriminate against any person in the performance of any of its obligations hereunder on the basis of race, color, creed, religion, national origin, age, sex, marital status, veteran status or

the presence of any disability. Implementation of this provision shall be consistent with Washington State Initiative 200, Sec. 1 (Effective 12/3/98).

SECTION 23. DISPUTES

Disputes or claims arising from contract shall be governed in accordance with Part 8 of the General Conditions for Kitsap County Facility Construction.

SECTION 24. CHOICE OF LAW, JURISDICTION AND VENUE

- a. This Contract has been and shall be construed as having been made and delivered within the State of Washington, and it is agreed by each party hereto that this Contract shall be governed by the laws of the State of Washington, both as to its interpretation and performance.
- b. Any action at law, suit in equity, or judicial proceeding arising out of this Contract shall be instituted and maintained only in any of the courts of competent jurisdiction in Kitsap County, Washington.

SECTION 25. SUCCESSORS AND ASSIGNS

The OWNER, to the extent permitted by law, and the CONTRACTOR each bind themselves, their partners, successors, executors, administrators, and assigns to the other Party to this Contract and to the partners, successors, administrators, and assigns of such other party in respect to all covenants of this Contract.

SECTION 26. SEVERABILITY

- a. If a court of competent jurisdiction holds any part, term or provision of this Contract to be illegal, or invalid in whole or in part, the validity of the remaining provisions shall not be affected, and the parties' rights and obligations shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.
- b. If it should appear that any provision of this Contract is in conflict with any statutory provision of the United States or the State of Washington, said provision which may conflict therewith shall be deemed inoperative and null and void insofar as it may be in conflict therewith, and shall be deemed modified to conform to such statutory provision.

SECTION 27. ENTIRE AGREEMENT

The parties agree that this Contract is the complete expression of its terms and conditions. Any oral or written representations or understandings not incorporated in this Contract are specifically excluded.

SECTION 28. NOTICES

Any notices shall be effective if personally served upon the other party or if mailed by registered or certified mail, return receipt requested, to the addresses set out in Section 3. Notice may also be given by facsimile with the original to follow by regular mail. Notice shall be deemed to be given three days following the date of mailing or immediately if personally served. For service by facsimile, service shall be effective upon receipt during working hours. If a facsimile is sent after working hours, it shall be effective at the beginning of the next working day.

SECTION 29. INSPECTION

The OWNER or the OWNER'S REPRESENTATIVE shall have the right (a) to inspect and obtain copies of all written licenses, permits, or approvals issued by any

governmental entity or agency to the CONTRACTOR, its delegates, or subcontractors, which are applicable to the performance of this Contract, and (b) to inspect all Work and Materials for conformity with the Contract terms. The CONTRACTOR shall be responsible for ensuring the Work and materials conform to the Contract terms even if the OWNER or the OWNER'S REPRESENTATIVE conducts any inspection of the same.

SECTION 30. MODIFICATION

Except as provided in Section 16, all amendments or modifications to the Contract shall be in writing, signed by both parties, and attached to this Contract.

SECTION 31. LIQUIDATED DAMAGES

Upon written notice by the OWNER, liquidated damages at a rate of \$500.00 per working day or any portion thereof will be assessed against the CONTRACTOR for late performance or delay in the substantial completion of the work to be performed under this Contract. This provision in no way limits the OWNER's right to seek damages for the CONTRACTOR's breach of any other of its obligations under this Contract pursuant to Section 18 of this Contract or to actual damages for the CONTRACTOR's failure to achieve final completion within the time set forth in Section 1.

SECTION 32. CONTRACTS PROVISION

In the event language in this Contract conflicts with the requirements in the Project Documents, the language in the Contract controls.

This Contract is executed by the persons signing below who certify that they have the authority to execute the Contract. The parties to this Contract have executed this Contract to take effect as of the date written below.

This Contract shall take effect this _____ day of _____, 2016.

CONTRACTOR

KITSAP COUNTY
BOARD OF COUNTY COMMISSIONERS

FIRM

EDWARD E, WOLFE, Chair

SIGNATURE

CHARLOTTE GARRIDO, Commissioner

PRINTED NAME

ROBERT GELDER, Commissioner

TITLE

CONTRACTOR'S REGISTRATION NO.

ATTEST

FEDERAL TAX I.D. NO.

DANA DANIELS, Clerk of the Board

SECTION 01 1100

SUMMARY OF WORK

PART 1 - GENERAL

1.01 PROJECT DESCRIPTION

- A. Briefly and without force and effect upon the Contract Documents, the Work of the Contract can be summarized as follows:
 - 1. Construct the South Kitsap Regional Park: Skatepark Phase 1C, Port Orchard WA.
 - 2. The project includes construction improvements of an existing 80-acre park and includes site clearing and earthwork, landscaping, pedestrian trails, site pavements consisting of concrete and crushed aggregate, and skatepark addition.
- B. Provide materials, labor, equipment, temporary facilities and construction expertise as required to complete the Project as shown in the Contract Documents.
- C. Contractor represents that he has carefully examined prior to bidding, all Contract Documents and site conditions, and understands the character, quality and quantity of work called for and all conditions affecting the Contract Work.

1.02 GENERAL INFORMATION

- A. Project: South Kitsap Regional Park: Phase 1C
- B. Consulting Services:
 - 1. The Consultants involved in the preparation of the Drawings and Specifications are:
 - Landscape Architecture:
BCRA – Alan McWain, PLA
414 Stewart St., Ste. 200
Seattle, WA 98101
 - Civil Engineer:
BCRA – Justin Gorocho, PE
2106 Pacific Avenue, Suite 300
Tacoma, WA 98402
 - Skatepark:
New Line Skateparks, Inc. – Kyle Dion
6249 205th St., Suite 101
Langley, BC, CANADA
V2Y 1N7

1.03 CONTRACT METHOD

- A. Construct the Work under a guaranteed single fixed-price Contract.

- B. The General Contractor is responsible for coordinating, understanding and directing the work of all trades involved in the project.
- C. Contractor is responsible for coordinating and scheduling work of each subcontractor to expedite progress of the Project. Cooperate and coordinate with any other separate Contractors under Contract with the Owner.

1.04 EXISTING UTILITIES

- A. Refer to Section 02 1725.

1.05 OBJECTIONS TO APPLICATION OF PRODUCTS

- A. All Contractors submitting a bid for this Project shall thoroughly familiarize themselves with specified products and installation procedures and submit to Landscape Architect any objections (in writing) no later than ten days prior to Bid Date. Submittal of Bid constitutes acceptance of products and procedures specified.

1.06 EXISTING INFORMATION

- A. Verify on site existing conditions prior to bidding. Submit to Landscape Architect any discrepancies no later than ten days prior to Bid Date. Submittal of bid constitutes acceptance of existing conditions.

1.07 MISCELLANEOUS

- A. Items include, but are not limited to:
 - 1. Maintain pedestrian and vehicular access to and around existing facilities.
 - 2. Do not encumber site access with materials or equipment.
 - 3. Do not overload structure with weight endangering structure.
 - 4. Obtain and pay for use of additional storage or work areas needed for operations.

1.08 COMPLETION TIME

- A. Time is of the essence, the Owner needs this project completed within the times listed so that they can use the spaces for their intended purpose and fulfill commitments they have already made. Provide the necessary management, equipment and manpower, including any overtime, double-shifting, or special work schedules, required to achieve completion of the Project within the times listed in the following Completion Schedule.
- B. Completion Schedule:
 - 1. Start Construction work: Date noted in Notice To Proceed.
 - 2. Substantial Completion: Complete all project work by **March 4, 2016** calendar days from date noted in Notice to Proceed.
 - 3. Complete Punchlist Items: Within 14 calendar days of Substantial Completion.
 - 4. Achieve Final Completion within 21 calendar days after date Substantial Completion.

1.09 LIQUIDATED DAMAGES

- A. Refer to the Bid Proposal and General Conditions for liquidated damages amount and provisions.

1.10 CONTRACTOR'S USE OF BUILDING AND SITE

- A. The Contractor has direct responsibility for and control of the Contractor occupied construction areas for the duration of the Project, subject to the following:
- B. Contractor's Use of Site and Buildings: Limit use of the site and buildings for work, storage and access only as required to achieve work of this contract.
- C. Work Restrictions: Work shall be accomplished during normal working hours between 7:00 AM and 6:00 PM Mondays through Fridays.
- D. Construction Facilities and Temporary Controls: Refer to Section 01 5000.
- E. Emergency Vehicle Access: Maintain access roadway and fire lanes on site for use by emergency vehicles. Coordinate requirements with local authority having jurisdiction
- F. Access Routes to Construction Areas: Contractor shall maintain site access routes in a clean and safe manner free of construction materials, debris and dirt.
- G. Public Safety: Contractor is responsible for performing a safety analysis for the site and implementing conclusions from their analysis and, for maintaining site in a manner which prevents any unsafe or potentially unsafe condition.
- H. Security: Assume full responsibility for the protection and safekeeping of products installed under this Contract or stored on the site.

1.11 CONSTRUCTION DOCUMENTS

- A. The Landscape Architect will provide 1 complete printed sets of the Contract Documents to the Contractor at no charge. If additional sets are required, the Landscape Architect will provide the reproducible originals of the Contract Documents and Addenda to the printing company of the Contractor's choice for the purpose of printing as many sets of Documents as the Contractor requires for the construction of this project. All printing of additional sets and document delivery costs will be paid by the Contractor.
- B. Contractor is responsible for posting any addendums in the Contract Drawings and Project Manual.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 2900

SCHEDULE OF VALUES & PAYMENT APPLICATION

PART 1 - GENERAL

1.01 FORMAT

- A. Type Schedule of Values on 8-1/2 x 11 inch bond paper.
- B. Prepare Schedule of Values and Payment Application on format required by Owner.
- C. For Specification Divisions 2 through 17 of the Project Manual follow the Table of Contents for minimum listing of schedule of values. Identify each line item by number and title of each Specification section. Complex line items may be required to be listed in component parts of the line item.
- D. List material and labor costs on separate line items for any work item where payment for materials on site will be requested prior to any labor being done.
- E. For Specification Division 1 as a minimum include one line item for each of the following: mobilization, General Conditions, bonds and insurance, punchlist correction, "record" drawings, O&M manuals, and demobilization.

1.02 REQUIREMENTS

- A. These requirements are in addition to the requirements found in the General Conditions.
- B. Two weeks prior to submission of first Application and Certificate for Payment, submit schedule of values to Landscape Architect for review.
- C. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest dollar.
- D. List guarantees/warranties as separate line items for each type of work, such as roofing, painting, etc. Show the value of each of these on the Schedule of Values.
- E. For each major subcontract, list products and operations of that subcontract as separate line items.
- F. For each line item of installed value exceeding \$30,000, show breakdown by major products or operations as separate line items.
- G. Coordinate listings with Progress Schedule.
- H. All line item listings shall each include a directly proportional amount of Contractor's overhead and profit.

- I. For items on which payments will be requested for stored products, list subcontractor-values for cost of stored products.
- J. Include separate line item for Project Completion. Cost for this item shall be either one-half of the Contractor's mobilization cost or 1 percent of the total Contract Amount, whichever amount is greater.

1.03 SUBMITTAL

- A. Submit five copies of Schedule.
- B. Transmit under transmittal letter. Identify Project by title and by contract number.

1.04 SUBSTANTIATING DATA

- A. When Landscape Architect requires substantiating information, submit data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of Application and Certificate for Payment.

1.05 APPLICATION AND CERTIFICATE FOR PAYMENT

- A. Refer to General Conditions of the Contract.
- B. The approved Schedule of Values will be typed by the Contractor onto Application and Certificate for Payment Forms approved by the Owner.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**SECTION 01 3100
PROJECT MANAGEMENT & COORDINATION**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for
 1. Project Management
 2. Coordination
 3. Variations, Revisions And Clarifications
 4. Request For Information
 5. Preconstruction Conference
 6. Progress Meetings
 7. Pre-Installation Conferences

1.03 PROJECT MANAGEMENT

- A. General: Provide direct, effective, experienced, cooperative, team-oriented, hands-on management of the Work including the daily construction operations on the project site and that part of the Work that the Contractor chooses to delegate to Subcontractors/Suppliers.
 1. Project management personnel shall be employees of the Contractor and shall not be subcontracted, or delegated to others.
 2. Site Management Personnel: This Project requires a minimum of 1 full time project management personnel on the Project site, a Superintendent as specified below.

- B. SUPERINTENDENT: Employ a Project Superintendent (different person than the Project Manager) on the project site to oversee, direct, and manage the construction of the Work and including, but not limited to, the following minimum characteristics and responsibilities:
 1. A good communicator, organized, effective and capable of managing multiple tasks, difficult personalities and tight deadlines without losing self-control or management effectiveness.
 2. Trained, knowledgeable and experienced in jobsite safety and shall be responsible for managing safety issues on site in conformance with all Federal, State and Local regulations.
 3. Superintendent shall become thoroughly familiar with the requirements of the Contract Documents before work is started.
 4. Responsible for executing the Work in conformance with the Construction Schedule specified in Section 01 3215 so that Project is completed on time.
 5. Oversee and direct the work of Subcontractors and suppliers and confirm they are conforming to the requirements of the Contract Documents.
 6. Jointly with the Project Engineer, coordinate the Work of this project as

- specified under "Coordination" in this Section.
7. Responsible for determining the means and methods used to execute the Work.
 8. Responsible for coordinating Work requiring independent inspection with the testing agency(s).
 9. Responsible for managing and controlling the quality of the Work (including work by Subcontractors) in conformance with the Contract Documents and good construction practice.
 10. As-Built Drawings: Manage the preparation of the as-built drawings specified in Section 01 7000.
 - a. Coordinate Subcontractor as-built data incorporation into the as-built drawing set.
 - b. Maintain up-to-date as-built drawing set in the field office for review by Landscape Architect and Engineers upon request or at monthly payment request review.
 11. Responsible for coordinating with the local Building Department and Building Inspector(s) inspections and requirements.
 12. Responsible for coordinating the final inspections required by Authorities having jurisdiction required for issuance of the Certificate of Occupancy.
 13. Responsible for inspecting the work jointly with the Project Manager and preparing the Contractor's Punch List as specified in Section 01 7800.

1.04 COORDINATION

- A. General: Coordinate the Work and construction operations required in different Sections of the Specifications:
 1. Ensure efficient and orderly installation of each part of the Work.
 2. Coordinate different work and trades that depends on each other for proper installation, connection, and operation.
 3. No additional compensation will be approved for extra work incurred through the lack of cooperation and coordination.
- B. Coordination Planning & Administration: Plan out the Work in advance and anticipate the interrelationships between each subcontractor and their relationship to the overall Project.
 1. Provide the leadership, direction and decisions necessary to prevent subcontractor and supplier problems and disputes from affecting the project schedule or the quality of the work.
 2. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure proper, efficient and orderly sequence of preparation and installation of interdependent construction elements, with provisions for accommodating items installed later.
 3. Hold coordination meetings with each trade to determine Work requiring coordination with other trades/Sections.
 4. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Subcontractor Coordination: Provide direct supervision and coordination of each Subcontractor and each part of the Work; require each Subcontractor to coordinate their portion of the Work and provide their requirements for coordination of their Work

with other related Work.

1. Schedule such work so as to prevent delays in dependent work and so that all related work will progress together.
 2. Fully inform each trade or Subcontractor of the relation of its work to other work, and require each to make necessary provisions for the requirements of such other work.
 3. Do not delegate Subcontractor coordination responsibility to any subcontractor.
- D. Sequence of Work Coordination: Coordinate the Work of all trades and other Sections to ensure that all elements of the work are installed in their proper sequence, without the need for unplanned modifications to work already installed.
- E. Underground Utilities Coordination: Coordinate each underground utility with the other utilities, with existing utilities, site improvements and the work of other trades.
1. Coordinate space requirements and installation sequence of underground utilities.
 2. Lay out, work through and resolve any conflicts or problems involving underground utilities that share the same space or require a special sequence of installation prior to starting any fabrication or installation. Provide coordination drawings wherever needed to maintain control of the installation in areas involving numerous trades.
- F. Mechanical and Electrical Coordination: Coordinate mechanical and electrical Work with that of other trades in order that various components of systems are installed at proper time, fit available space, and allow proper service access to those requiring maintenance, including equipment specified in other Divisions.
1. Coordinate the mechanical and electrical work with the work of other trades to assure proper fit and the proper operation of all systems and equipment.
 2. Coordinate space requirements and installation of mechanical and electrical work. Route pipes, ducts, and conduit, as tight and compact as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 3. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
 4. Lay out, work through and resolve any conflicts or problems involving mechanical and electrical work that share the same space or require a special sequence of installation prior to starting any fabrication or installation. Provide coordination drawings wherever needed to maintain control of the installation in areas involving numerous trades.
 5. Leave adequate space for maintenance access, by a normal size maintenance man, to all equipment and items without the need for special equipment or removal of items that block access.
- G. Completion & Closeout Coordination: Coordinate the efficient completion and closeout of the Work by each Subcontractor.
1. Coordinate completion and clean up of Work of separate trades in preparation for Completion.
 2. After substantial completion, coordinate access to site for correction punch list items; minimize disruption to the building occupants if applicable.

- H. Existing Conditions Coordination:
 - 1. Lay out and mark all existing utilities requiring protection or which remain operational or active during construction, to prevent any accidental damage or disruption of building services during this Project.

1.05 VARIATIONS, REVISIONS AND CLARIFICATIONS

- A. Variations, revisions and clarifications to the work not involving an adjustment to the Contract Sum or Contract Time will be confirmed in writing. These written confirmations may be included in the project minutes, memos to the Contractor and Owner, or in answers to written Requests for Information (RFI).

1.06 REQUEST FOR INFORMATION (RFI)

- A. Contractor shall review the Contract Documents and understand their requirements well in advance of doing the actual work to make sure they see no conflicts or unanswered questions that could delay the Work and to avoid requesting information from the Landscape Architect at the same time the work is scheduled to be accomplished.
- B. Contractor may send Landscape Architect a request for information when an interpretation or additional information is required to complete the Work, subject to the following restrictions:
 - 1. Contractor shall assign a number to each RFI following standard numerical order.
 - 2. RFI shall be submitted on the RFI form included at the end of this Section. This form must be completely filled out by the Contractor prior to submission.
 - 3. RFI must be legible and clearly written.
 - 4. RFI shall be limited to a single subject and discipline, do not submit RFI with multiple unrelated questions.
 - 5. RFI shall not request information that is already shown on the Drawings.
 - 6. RFI shall not request resolution of coordination issue that is Contractor's responsibility to resolve.
 - 7. RFI shall allow a reasonable length of time for Landscape Architect to research and respond given the nature of the question; requests for unreasonable response times by Landscape Architect shall not be used as the basis for any increase in time or cost. Landscape Architect will endeavor to answer RFI in the shortest time possible and not exceeding 5 working days unless mutually agreed by both parties.
 - 8. RFI shall not include requests for information that can be, or already have been addressed on the shop drawing/submittal.
 - 9. RFI shall not request information that the Contractor already possess.
 - 10. RFI shall not be used as a means to leverage or angle for a claim.
 - 11. Contractor shall not proceed in accordance with any response to an RFI that will result in additional cost until the cost is identified and authorized by the Owner.
- C. RFI may be sent to Landscape Architect via mail, fax or e-mail.
 - 1. Attachments to e-mailed RFI shall be electronic files in Adobe Acrobat PDF format.

- D. Contractor shall distribute RFI with Landscape Architect's response to all Subcontractors and suppliers that have work that may be affected in any way by Landscape Architect's response.

1.07 PRECONSTRUCTION CONFERENCE

- A. Landscape Architect and Owner will schedule a preconstruction conference after Contract is issued.
- B. Agenda:
 - 1. Designation of personnel representing the parties in Contract and the Landscape Architect.
 - 2. Discussion of list of Subcontractors, schedule of values, and project schedule.
 - 3. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
 - 4. Scheduling.
 - 5. Coordination with Owner.
 - 6. Testing and inspection coordination.
 - 7. Procedures for maintaining record documents.
 - 8. Requirements for start-up of equipment.
 - 9. Inspection and acceptance of equipment put into service during construction period.

1.08 PROGRESS MEETINGS

- A. Progress meetings will be held on a regularly scheduled basis not exceeding once per week.
- B. Location of Meeting: Progress meetings will be held at the job site.
- C. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review Four-Week Schedule, including Work in progress accomplished since previous meeting and work planned.
 - 3. Review Project Schedule.
 - 4. Identification of problems which impede planned progress.
 - 5. Corrective measures to regain projected schedules.
 - 6. Review submittal schedules and status of submittals.
 - 7. Review of off-site fabrication and delivery schedules.
 - 8. Review of Request For Information (RFI).
 - 9. Review deliveries to site.
 - 10. Review proposed changes.
 - a. Affect of proposed changes on progress schedule and coordination.
 - b. Affect on other contracts of the Project.
 - 11. Review project technical concerns/questions.
 - 12. Field observations, problems, and decisions.
 - 13. Review As-Built Drawings.
 - 14. Inspection and Test Reports.
 - 15. Maintenance of quality and work standards.
 - 16. Other business relating to Work.

- D. **Four-Week Schedule:**
 - 1. Prior to each meeting, the Contractor will prepare a 4 week schedule of work that is in progress for the current week and work planned for the next 3 weeks on the schedule form included at the end of this Section. This 4 week schedule, which is revised weekly by the contractor, will be presented by the Contractor at the progress meeting and a copy will be given to the Landscape Architect and to the Owner at that time.
 - 2. In the event that a progress meeting is not scheduled for the current week, the Contractor will still prepare the 4 week schedule and will forward it to the Landscape Architect in the same week.
- E. Meeting Notes: Landscape Architect will record notes of the meeting and distribute to the Contractor and Owner.
 - 1. Contractor shall be responsible for distributing meeting notes to subcontractors, suppliers and other persons of interest or in attendance.

1.09 PRE-INSTALLATION CONFERENCES

- A. When required in individual specification Section, the Contractor shall convene a pre-installation conference at work site prior to commencing work of the Section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific Section.
- C. Notify Landscape Architect seven calendar days in advance of meeting date.
- D. The Contractor to prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to participants, with 3 copies to the Landscape Architect.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

REQUEST FOR INFORMATION

TO: BCRA
414 Stewart St. Ste 200
Seattle WA 98126

ATTN: _____

RFI # _____

PROJECT: South Kitsap Regional Park: Skatepark Phase 1C

REFERENCE DRAWING OR SPEC: _____

SUBJECT OF RFI: _____

DESCRIPTION: _____

CONTRACTOR: _____ RESPONSE REQUESTED BY (DATE): _____

BY: _____ DATE: _____

RESPONSE: _____

A/E: _____

BY: _____ DATE: _____

COPIES TO: _____

This is not an authorization to proceed with work involving additional cost and/or time. Contractor shall obtain approval/authorization *prior to* proceeding with this work if the response in this RFI will result in additional cost and/or time.

SECTION 01 3215 CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for the Contractor's Construction Schedule.

1.03 GENERAL

- A. The intent of the construction schedule is to assist the Contractor in planning and execution of the Work in a timely manner and assist the Contractor, Landscape Architect and Owner in monitoring the construction progress for the purpose of coordination, communication, evaluation of Applications and Certificates for Payment, and evaluation of time extension requests.
- B. This Section supplements the General Conditions with additional schedule requirements.
- C. Any plan by the Contractor to complete the Work or any part of the Work earlier than any contract required milestone or specific completion date shall not be construed as creating any responsibility or liability for the Owner or Landscape Architect should their actions, or lack thereof, prevent the Contractor from achieving the planned early completion. The Owner and Landscape Architect shall not be liable to the Contractor for any costs or other damages if the Contractor is unable to achieve early completion of the Work before a milestone or completion date.
- D. Float Time: Float time is the amount of time between the earliest start date and the latest start date, or between the earliest finish date and the latest finish date of a chain of activities on the CPM Schedule. Float time belongs to the project and is not for the exclusive use or benefit of either the Contractor or the Owner; float time may be used by either the Contractor or Owner for offsetting delays. Use of float suppression techniques such as preferential sequencing, special lead/lag logic restraints, zero total or free float constraints, extended activity times or imposed dates shall be cause for rejection of the Construction Schedule or any revisions or updates.
- E. Scheduling Personnel: Contractor's shall employ scheduling personnel or consultant with a minimum of 5 years of experience using the proposed scheduling software on projects of similar size and scope. If requested, provide a list of scheduling experience with copies of the schedules.

- F. Schedule shall anticipate and include sufficient float time for weather dependent work tasks to allow for any delays due to normal inclement weather (defined as any inclement weather within the ten year average of accumulated record mean values from climatological data compiled by the National Oceanic and Atmospheric Administration (NOAA), for the locale of the project, over the full duration of the Contract Time).

1.04 CONSTRUCTION SCHEDULE

- A. Construction Schedule:
1. Schedule Methodology: Critical Path Method (CPM) for the planning, scheduling and reporting of the work required by this contract.
 2. Schedule Type: Precedence Diagramming Method (PDM).
 3. Acceptable Software Programs:
 - a. Microsoft Project
 - b. Microsoft Excel
 4. Schedule Sheet Size: 11 x 17 inches
 5. Schedule Contents: Schedule shall contain the following information:
 - a. Task ID number (numbered in ascending order, (e.g. 1, 2, 3, 4, etc.)
 - b. Task Name (activity), provide a two or three word description of each activity; identify each activity with the applicable Specification Section number (e.g. *Domestic Water Distribution- 02510*).
 - c. Task Duration (e.g. 10 days)
 - d. Early Task Start Date (e.g. *Mon 7/22/02*)
 - e. Late Task Start Date (e.g. *Mon 7/29/02*)
 - f. Early Task Finish Date (e.g. *Mon 7/22/02*)
 - g. Late Task Finish Date (e.g. *Mon 7/29/02*)
 - h. Float Time (e.g. 7 days)
 - i. Calendar: List the Weeks, Months and Year(s) across top of each page of the schedule. Show a graphic task duration bar indicating the start and finish date corresponding to the calendar for each task.
- B. Schedule Requirements: Include the following requirements:
1. List every work activity required to complete the Work in the Task Name column and include the following:
 - a. Task Name shall describe individual work activities in a defined area of the project, not multiple work activities for the entire project, e.g. *underslab plumbing rough-in – west wing* instead of *plumbing* for the entire project. Provide as many activities as necessary to clearly show how the project will be constructed within the time allowed.
 - b. Include milestone dates as defined by the Contract Documents including Substantial Completion and Final Completion dates.
 - c. Include submittal dates including specified Landscape Architects' review time for shop drawings, product data, and samples.
 - d. Indicate date required for selection of colors and finishes as applicable.
 - e. Include product delivery dates, including those furnished and/or installed by separate contractors or the Owner.
 - f. Show dates when application for separate permits (ie. fire alarm, fire sprinkler, etc.) will be made and when permit will be received.
 - g. Include task for curing each concrete slab pour with task duration corresponding to the specified curing time.
 - h. Include dates for Contractor's Punch List review and Contractor's completion of punchlist items

- i. Include dates for Landscape Architect's Punch List review and Contractor's completion of punchlist items.
 - j. Show dates for all final inspections required by authorities having jurisdiction required to release Certificate of Occupancy.
 - k. Include dates for preparation and submission of operation and maintenance manuals and project record drawings (minimum of 30 days before final completion). Show Landscape Architect's review time and resubmittal of corrected manuals and drawings.
2. Keep individual tasks listed to short durations with limited scope of work (one to two weeks maximum) unless the task is dependent on several activities of longer duration.
 3. Each task shall have a corresponding time duration bar to the right of the columns graphically showing the duration of each activity on the calendar.
 4. Show complete sequence of construction by activity, identifying work of separate contractors or Owner required to complete the Work.
 5. Graphically indicate each task that is on the critical path for completion (by color or pattern) on the task duration bar. Show the interrelationship of each critical path task to other critical path tasks by drawing arrows between the task duration bar finish and start points.
 6. Include sufficient additional float time in the duration of those specific activities that are weather dependent (such as: earthwork, concrete slabs, masonry, roofing, painting, etc.) to prevent delaying critical path activities due to normal inclement weather based on the time of year the tasks are being accomplished and the corresponding historic weather data averages for those dates.
 - a. Weather related float time shall be calculated after late task finish date and shall be included in the critical path time calculation.
 - b. Identity additional weather related time allowed in the duration or include as a separate task directly under the affected work task.

1.05 UPDATING SCHEDULES

- A. Update the construction schedules monthly to reflect actual work activity dates accomplished and any revised work activity dates.
- B. Maintain Construction Schedules to record actual start and finish dates of activities as they are completed.
- C. Indicate progress of each activity at the time of the revision date. Update diagrams to graphically depict current status of Work.
- D. Indicate revision date on revised schedule.
- E. Show changes occurring since previous Schedule submission such as:
 1. Any major changes in scope;
 2. Activities modified since previous submission;
 3. Revised projections for progress and completion, as applicable;
 4. Any other identifiable changes.
- F. Provide narrative report as needed to define:
 1. Problem areas; anticipated delays; and impact on schedule.

2. Corrective action to be taken by the Contractor to get the project back on schedule. This report will define how and when the Contractor will accomplish this.

1.06 RECOVERY SCHEDULE

- A. Whenever completion of any critical path activity(s) extends beyond its late finish date or in any way jeopardizes timely completion of a Contract milestone date or completion date the Contractor shall prepare a recovery schedule showing how work activity start and finish dates will be revised to allow the completion of milestone and completion dates on schedule.
- B. Recovery schedule shall be prepared as soon as possible after discovery of any delay affecting critical path activity(s), but not longer than 7 days.

1.07 SUBMITTALS

- A. Prepare and submit proposed construction schedule to Owner and Landscape Architect as soon as possible after Notice to Proceed and prior to first Application for Payment.
- B. Submit updated schedule with each Application for Payment or more frequent if required.
- C. Applications for Payment will not be processed until schedule is in conformance with requirements of the specifications.

1.08 DISTRIBUTION

- A. Distribute copies of construction schedule to project site file, Subcontractors, suppliers, Owner, Landscape Architect, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.
- C. Construction Office: Post a copy of the current Construction Schedule on the wall in the construction office where the job meetings will be held; suspend a moveable vertical line on the current date to facilitate review and discussion of schedule progress and issues at weekly job meetings.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 3300 SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for project submittals.

1.03 SUBMITTAL PROCEDURES

- A. Schedule submittals to expedite the Project. Transmit submittals in accordance with Construction Schedule and in such sequence to avoid delay in the Work. Coordinate submission of related items with schedule.

- B. Contractor Shall:
 - 1. Review and approve each submittal prior to submission to Landscape Architect.
 - 2. Reproduce and distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions. Pay all costs for reproduction, distribution and materials.
 - 3. Coordinate submittals into logical groupings to facilitate inter-relation of the several items:
 - a. Finishes which involve Landscape Architect selection of colors, textures, or patterns.
 - b. Associated items which require correlation for efficient function or for installation.
 - 4. Identify, in writing, variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.
 - 5. Accompany submittals with transmittal letter containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Number of copies of Shop Drawings, Product Data and Samples submitted.
 - e. Identification of submittal as it relates to:
 - 1) Subcontractor/Supplier/Manufacturer:
 - Name.
 - Address.
 - Telephone number.
 - Representative's name.
 - 2) Detail number and location in Construction Documents.
 - 3) Specification reference number and paragraph.
 - 4) Applicable Standards.

- 5) Finishes.
- 6) Identification of deviations from Contract Documents.

- C. Additional Information Required:
1. Relation to adjacent structure or materials.
 2. Fabrication methods, assembly, special installation requirements, accessories, fasteners, and other pertinent information.
 3. Field dimensions, clearly identified.
 4. Coordination with other trades. Stamped and signed by affected trades.
- D. Distribution:
1. Deliver submittals to Landscape Architect for review.
 2. Send copy of Landscape Architect reviewed submittal to all Subcontractors with work affected by or requiring information from or coordination with the submittal information to perform their work properly.

1.04 SUBCONTRACTOR'S LIST

- A. Prior to submission of First Application for Payment, submit complete list of subcontractors and suppliers to be used for the Work. Provide specification section identification number, addresses and telephone numbers for each listed subcontractor and supplier providing materials in excess of the amount stated in the General Conditions.

1.05 SHOP DRAWINGS

- A. Present in clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.
- B. Identify field dimensions; show relation to adjacent or critical features or Work or products.
- C. Minimum Sheet Size: 8-1/2 x 11 inches.
- D. Do not submit freehand drawings.
- E. On shop drawings requiring Code Agency approval, submit on format and media required by Approval Agency. Include information required by Project Documents and Approval Agency.
- F. For shop drawings larger than 11" x 17" submit shop drawings in the form of two opaque reproductions. The Landscape Architect will return to the Contractor a single copy of the reviewed reproduction with comments. After review, the Contractor will reproduce and distribute copies of the shop drawings.

1.06 PRODUCT DATA

- A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.
- C. Submit number of copies Contractor requires, plus 2 copies for Landscape Architect and 1 copy for the Owner.

1.07 SAMPLES

- A. Submit two samples of the specified color and texture for each product unless specified otherwise in individual specification sections; samples will be retained by Landscape Architect.
- B. Where a specific color has not been specified, submit full range of manufacturer's standard and special finishes except when more restrictive requirements are specified, indicating colors, textures, and patterns, for Landscape Architect selection.
- C. Submit samples which may be used in the Work as indicated in the Specification section.
- D. Label each sample with identification required for transmittal letter.
- E. Field samples are to be maintained at the site of the Work and are to be removed after substantial completion unless directed otherwise.
- F. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.08 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturer's certificate to Landscape Architect for review, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Landscape Architect/Engineer.

1.09 CONTRACTOR REVIEW

- A. Coordinate submittals with requirements of Work and of Contract Documents.
- B. Apply Contractor's stamp with signature. The submittal signed by the Contractor certifies that the Contractor has reviewed the submittal for accuracy, completeness and compliance in accordance with the General Conditions. It also certifies that the Contractor has verified products required, field dimensions, adjacent construction work, and coordination of information, in accordance with the requirements of the Work and Contract Documents. Submittals without Contractor's stamp and signature are rejected. Notify Landscape Architect in writing at time of submittal, of any deviations from requirements of Contract Documents.

1.10 RESUBMITTALS

- A. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- B. Shop Drawings and Product Data:
 - 1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
 - 2. Indicate any changes which have been made including those requested by the Landscape Architect.
- C. Samples: Submit new samples as required.

1.11 LANDSCAPE ARCHITECT REVIEW

- A. Landscape Architect or their consultant(s) will review shop drawings, product data, and samples and return submittals to Contractor.
- B. Landscape Architect's review is qualified by the following language included on the review stamp: "This review is only for general conformance with design concept of the Project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of his or her Work with that of all other trades; and for performing all work in a safe and satisfactory manner".
 - 1. Any action shown is subject to Contract Document's requirements. Landscape Architect will mark the review submittal in one of the following boxes on review stamp:
 - Reviewed
 - Furnish As Corrected
 - Rejected
 - Revise and Resubmit
 - Submit Specified Item
- C. Landscape Architect/Engineer review of individual or separate items does not constitute review of assembly in which it functions.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**SECTION 01 4500
QUALITY CONTROL**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for project quality control.

1.03 CONTRACTOR QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Employ/assign quality control personnel to monitor the Work of this project for conformance to the requirements of the Contract Documents and to good construction practices.
 - 1. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of the Contract Documents.
 - 2. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve specified requirements.
- C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- D. Perform work by persons qualified to produce workmanship of specified quality.
- E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion and disfigurement.
- F. Inspections and reports issued by special inspector or testing laboratory do not relieve the Contractor from his responsibility to construct Work in conformance with the requirements of the Contract Documents.
- G. Contractor is responsible to review and confirm that substrate construction, site conditions and work by others complies with requirements of Contract Documents and manufacturer's requirements for subsequent work prior to installation or cover.

1.04 REFERENCE STANDARDS

- A. Conform to reference standard referred to in individual specification section by date of issue current on date of Contract Documents.

- B. Obtain copies of reference standards that govern work performed on site.
- C. Should specified reference standards conflict with Contract Documents, the most stringent and restrictive requirement shall prevail except where Landscape Architect/Engineer provides other direction.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 INSPECTION AND TESTING LABORATORY SERVICES

- A. Owner will appoint, employ, and pay for services of an independent firm to perform inspection and testing.
- B. Scope of Inspection/Testing:
 - 1. The independent firm will perform inspections, tests, and other services as required by:
 - a. International Building Code and local Building Official
 - b. Individual specification sections in the Project Manual
 - c. As noted on the Drawings
 - d. As required by the Owner or Landscape Architect/Engineer.
 - 2. Inspections/Testing is required for the following, refer to specific specification sections and Structural General Notes on Drawings for detailed requirements:
 - a. Existing subgrade soil under buildings and pavements.
 - b. Soils used for structural fill.
 - c. Site cast concrete and reinforcing steel.
- C. Reports: Inspection and test reports will be submitted by the independent firm to the Authority Having Jurisdiction, Landscape Architect, Engineer, Contractor, and Owner, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- D. Contractor's Responsibility: Cooperate with independent firm; furnish safe access to the work to be inspected/tested, samples of materials, design mix, equipment, scaffolding, tools, storage, electrical power and assistance as requested.
 - 1. Schedule work to accommodate the time and sequence required for inspections and sampling.
 - 2. Coordinate inspection times for work in progress directly with independent firm.
 - 3. Notify Owner and independent firm 24 hours prior to expected time for operations requiring services.
 - 4. Provide safe access to test locations on site for testing lab personnel, including ladders, scaffolding, lifts, trench box, etc.
 - 5. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Retesting: Site visits and retesting required because of scheduling problems caused by the Contractor and/or non-conformance to specified requirements shall be performed by the same independent firm. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Representative to submit written report describing testing observations and recommendations. Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions shall also be included.
- C. Submit report in duplicate within 30 calendar days of observation to Landscape Architect for review.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

**SECTION 01 5000
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for the Contractor's construction facilities and temporary controls.

1.03 DESCRIPTION

- A. This Section specifies minimum actions required. Other actions may be specified elsewhere in the Contract Documents, manufacturer's literature, and governing regulations.
- B. Nothing in this Section is intended to limit types or amounts of construction facilities and temporary controls.
- C. No omission from this Section will be recognized as a temporary activity that is not required to complete the Work.

1.04 PROTECTION OF EXISTING UTILITIES

- A. Contractor shall confirm the location and layout of all utilities before making any connections or doing any work that could affect any existing utilities – refer to Section 02 1725 – Existing Site Utilities for additional requirements.
- B. If unknown utilities are encountered in the course of construction, protect them from damage and notify the utility Owner immediately. Do not remove or disable any unknown existing utility without the approval of the utility Owner.
- C. In the event utilities are damaged during construction, temporary services and/or repairs must be made immediately to maintain continuity of services at Contractor's expense.

1.05 DISPOSAL OF WASTE MATERIALS

- A. Dispose of all refuse and waste material, including excess earth from excavation, off Owner's property. Do not stockpile waste material on Owner's property. Immediately clean up any spilled material.
- B. Clean all trash and debris from work area daily. Keep work area, site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

- C. Provide on-site containers for collection of waste materials, debris and rubbish. Periodically remove waste from the site.
- D. Waste Construction Liquid Disposal: Provide portable containers for disposal of any waste construction liquids or fluids that are generated by or needed for the construction work. Do not dump any waste construction liquid or fluid (including paint, solvents, plaster mud, brush and tool cleanup water, etc.) down the building sanitary or storm drain systems or anywhere on the site (except clean water). Dispose of contents of all portable containers off site daily.
- E. Dispose of all flammable, hazardous, and toxic waste materials daily. Storage of these materials will not be permitted on the interior of building.

1.06 TEMPORARY ELECTRICITY

- A. The Contractor shall provide electrical power, including temporary power service or electrical generator(s) required to complete the work of this Contract. The Contractor will provide for all connection costs including but not limited to fees, meters, transformers, disconnects, cabling, etc. and shall remove temporary connections after Work is completed.
- B. Provide temporary electric feeders from electrical service. Power consumption shall not disrupt Owner's need for continuous service. Verify type of service characteristics and provide temporary feeders accordingly.
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes. Provide OSHA/WISHA approved flexible power cords as needed.
- D. Provide temporary service disconnect and over current protection at convenient location.

1.07 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations. Provide sufficient lighting to ensure proper workmanship everywhere.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as needed.
- C. Maintain lighting and provide routine repairs.

1.08 TELEPHONE SERVICE

- A. Provide and pay for telephone service to the job office for use of the Contractor, Landscape Architect and Owner. Install telephone service at time of mobilization and maintain throughout construction until demobilization is complete.
- B. Provide long distance phone service from vendor of contractor's choice and as approved for billing by the local phone company.

- C. Superintendent shall carry a digital/voice pager or a cellular phone to allow voice communication at all times.

1.09 TEMPORARY WATER SERVICE

- A. Provide, maintain, and pay for suitable quality water service required for construction operations. Pay all costs of connection and piping required to perform the work.
- B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.10 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain temporary OSHA/WISHA required portable toilet facilities and enclosures; in sufficient numbers and locations to accommodate the size of workers on site. Maintain daily in clean and sanitary condition.

1.11 TEMPORARY BARRIERS

- A. Provide barriers to protect the public from any potentially unsafe conditions, and from damage and/or dust from construction operations.
- B. Provide protection for existing plant life designated to remain. Replace damaged plant life.
- C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.12 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water.
- C. Provide settling basins and erosion control.
- D. Protect any facilities on-site and off-site from damage due to uncontrolled water.

1.13 TEMPORARY STORAGE

- A. The Contractor shall make whatever provisions necessary to ensure the safe and weathertight protection of materials, or equipment temporarily stored.

1.14 EXTERIOR ENCLOSURES

- A. After roof is installed and insulation or interior finishes are started, provide temporary, weather-tight enclosure over any portion of the building exposed to the weather to prevent the structure and finishes from getting wet.

1.15 PROTECTION OF INSTALLED WORK

- A. Protect installed work. Provide special protection where specified in individual specification sections or as required to prevent any type of damage or defacement.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- C. Prohibit traffic or storage upon poured concrete or shotcrete surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer and install protection. Remove and replace waterproofing or roofing material damaged during the work.
- D. Prohibit construction worker access to all rooms and areas which do not have construction work. After work in any area or room is complete, prohibit further worker access.
- E. Prevent any construction dust and dirt from entering the HVAC equipment and ductwork, computer equipment, electrical switchgear, building systems/equipment, smoke detectors or anything that will be adversely affected.

1.16 SECURITY

- A. Lock up any gates on the site each day prior to leaving the site to prevent unauthorized entry into the building or site.
- B. Maintain building security until the Owner takes permanent occupancy or until substantial completion is achieved, whichever occurs first.

1.17 ACCESS ROADS

- A. Provide and maintain access to fire hydrants, free of obstructions. Do not block access roads or prevent emergency vehicles access to site.

1.18 PROGRESS CLEANING

- A. Provide periodic cleaning to prevent any buildup or accumulation of construction debris and dirt on the site.
- B. Maintain areas free of waste materials, debris, rubbish and dust. Maintain site in a clean and orderly condition.
- C. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

1.19 ENVIRONMENTAL PROCEDURES

- A. ***Comply with all environmental and health safety regulations.***
- B. ***Burning on site is not permitted.***

1.20 FIELD OFFICE

- A. Office: Weather-tight, with lighting, electrical outlets, HVAC equipment, and equipped with sturdy furniture, plan rack and drawing display table.
- B. Provide office large enough to comfortably house the Superintendent, and to accommodate weekly jobsite meetings, with table and chairs adequate for all attendees.
- C. Provide copy and fax machine on site for use of Contractor, Landscape Architect and Owner.
- D. Provide computer(s) with Microsoft Word, Excel, and Adobe Acrobat software programs and internet connection for e-mail communication with Superintendent.
- E. Maintain office in organized and clean condition.

1.21 MACHINERY AND EQUIPMENT RESTRICTIONS

- A. Equipment and Internal Combustion Engine Noise: The noise level of each vehicle or piece of equipment shall not be greater than 90 DB(A) at a distance of 50 feet as measured under noisiest operating conditions. Mufflers for stationary engines shall be hospital-area quality of silencing.

1.22 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities, materials,
- B. Remove temporary underground installations to a minimum depth of 2 feet.
- C. Clean and repair damage caused by installation or use of temporary work.

1.23 EMERGENCY CONTACTS

- A. Provide Owner with two emergency contact names (Superintendent and Project Manager), with home phone, cell phone and pager numbers.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**SECTION 01 6000
MATERIAL AND EQUIPMENT**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for materials and equipment related to:
 - 1. Transportation and handling
 - 2. Storage and protection
 - 3. Product options
 - 4. Substitutions

1.03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.
- B. Provide interchangeable components of the same manufacturer, for similar components.

1.04 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide and pay for off-site storage and protection when site does not permit on-site storage or protection.

- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.06 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
- D. Products Specified by "Similar To" a Listed Manufacturer: Products with same function and similar quality and features to listed manufacturer.

1.07 SUBSTITUTIONS

- A. Substitutions will be considered up to 10 calendar days prior to bid opening date.
- B. Substitutions may be considered after contract award only when a product becomes unavailable through no fault of the contractor, or when the Owner deems it to be in the Owner's best interest to do so.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request constitutes a representation that the Bidder/Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the Substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, if they have not been previously approved.
- F. Substitution Submittal Procedure:

1. All substitution requests shall be accompanied with the Substitution Request Form, completely filled out. Substitution Request Forms are bound in the Project Manual in Section 01 6001. Limit each request form to one proposed substitution.
 2. Submit a minimum of 3 complete sets of substitution request forms and supporting data.
 3. Clearly indicate with red arrows on the supporting data the proposed substitution and accessories.
- G. Substitution Review Procedure: Because of the number of substitution requests typically received before bidding and the coordination required to review these, the following procedures will apply:
1. Substitution requests received after the time specified in paragraph 1.05 A. will not be reviewed nor listed on addenda.
 2. The Substitution Request Form and submitted data will not be returned to the submitter.
 3. Only approved substitutions will be listed on addenda. All proposed substitutions not listed on addenda shall be considered by the submitter and the Contractor as a non-acceptable substitution and shall not be used.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**SECTION 01 6001
SUBSTITUTION REQUEST FORM**

TO: **BCRA**
414 Stewart St. Ste 200
Seattle WA 98101

PROJECT NAME: South Kitsap Regional Park: Phase 1C

We hereby submit for consideration, the following product instead of specified item for above project:

Section _____ **Paragraph** _____ **Specified Item** _____

Proposed Substitution: _____

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

The undersigned states that the following paragraphs are correct:

1. The proposed substitutions does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantees or warranties of proposed product is equivalent to; or exceeds that of the specified product.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Certification of Equal Performance And Assumption Of Liability For Equal Performance:

Undersigned attests that the performance, function and quality of this proposed substitution are equal to or superior to the specified item and waives any rights to additional payment and time which may subsequently be necessitated by failure of the substitution to perform adequately, and for the required rework to make corrections thereof.

Submitted By:

Name (type or print neatly)

Signature (*has the authority to legally bind firm to the above terms*) Title

Firm

Address

City, State Zip

Telephone Date

Accept _____ Decline _____

Date Date

END OF SECTION

SECTION 01 7000 EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Work by Owner
 - 5. Owner-furnished, Contractor-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.

1.03 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Refer to Section 02 1725 for utility location requirements.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework,

investigate and verify the existence and location of underground utilities and other construction affecting the Work as specified in Section 02 1725.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Start of work/installation indicates acceptance of existing conditions as not conflicting with the requirements of the Contract Documents or the design intent and being acceptable without any modification.

3.02 PREPARATION

- A. Coordination: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Landscape Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.03 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Landscape Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels as needed to locate each element of Project.
 2. Establish horizontal layout as shown on the Control Plans included in the Drawings. Do not scale Drawings to obtain required dimensions.
 - a. Landscape Architect will provide an AutoCAD drawing file of the Control Plans to the surveyor upon request, subject to surveyor's agreement to Landscape Architect's standard release agreement.
 - b. Surveyor is responsible for verifying the data shown on the AutoCAD Drawing file **prior** to start of any construction operation as follows:
 - 1) Check the survey points shown from more than one control point.

- 2) Verify the accuracy of the layout shown against the existing site conditions.
- 3) Verify that the relationships shown on Drawings between utilities, buildings and site improvements matches the actual survey relationships.
- c. Notify Landscape Architect of any discrepancies in the survey points shown on the AutoCAD Drawing file immediately and assist in resolving the discrepancy prior to installing the construction staking or start of any construction operation.
3. Inform installers of lines and levels to which they must comply.
4. Notify Landscape Architect when deviations from required lines and levels exceed the following tolerances:
 - a. Horizontal Layout: 1 inch in 400 feet
 - b. Vertical Layout: 0 inches
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Structure Lines and Levels: Locate and lay out control lines and levels for structures, foundations, and slab levels. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Landscape Architect.

3.04 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 1. Do not change or relocate existing benchmarks or control points without prior written approval of Landscape Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Landscape Architect before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

3.05 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling, or as approved by the Landscape Architect.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Landscape Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.06 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

- E. Concealed Spaces: Remove dirt and debris from concealed spaces and remove dust using a commercial vacuum before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.07 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Arrange for a factory-authorized service representative to inspect and repair any piece of equipment that does not function properly or cannot be made to operate as specified.

3.08 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.09 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.

- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

**SECTION 01 7800
CONTRACT CLOSEOUT**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General Conditions and Supplemental General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for the contract closeout including:
 - 1. Closeout Procedures
 - 2. Final Cleaning
 - 3. Project Record Documents
 - 4. City Approved Permit Drawing Set
 - 5. Operation & Maintenance Data
 - 6. Spare Part and Maintenance Materials
 - 7. Punch List Re-Review Fees
 - 8. Final Adjustment of Accounts

1.03 CLOSEOUT PROCEDURES

- A. Comply with the General Conditions of the Contract.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to punchlist review.
- B. Clean site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and temporary construction facilities from the site.

1.05 ADJUSTING

- A. Adjust operating products and equipment in accordance with manufacturer's recommendations and specification section to ensure smooth and unhindered operation.

1.06 PROJECT RECORD DOCUMENTS

- A. The Project Record Documents shall consist of the following:
 - 1. Contract Documents (Drawings, Project Manual, Addendums and Change Orders).
 - 2. Drawings of Contractor-designed systems, (i.e. irrigation systems, plumbing, HVAC system, fire sprinkler systems, controls, electrical, fire alarms, etc.).
- B. Maintain on-site throughout the construction period, one set of the project record documents and record actual revisions to the work on these documents.
 - 1. Store Record Documents separate from documents used for construction.
 - 2. Record information concurrent with construction progress.
 - 3. Project Manual: Legibly mark, cloud and flag Project Manual changes and include a description of actual Products installed, including the following:

- a. Manufacturer's name and product model and number.
 - b. Product substitutions or alternates utilized.
 - c. Changes made by Addenda and Change Order.
4. Contract Drawings: Legibly mark, cloud and flag each item to record actual construction including:
- a. Measured depths of foundations in relation to finish first floor datum.
 - b. Measured horizontal and vertical locations of underground utilities referenced to permanent surface improvements.
 - c. Measured location of internal utilities concealed in construction, referenced to visible and accessible features of the work.
 - d. Field changes of dimensions and detail.
 - e. Details not on original Contract Drawings.
 - f. Transcribe Addenda to Project Record Documents.
 - g. Transcribe Change Orders to Project Record Documents.

C. Prior to contract closeout, prepare and deliver record documents to Landscape Architect as follows:

- 1. Project Manual: One copy of Project Manual (in good, clean condition) legibly marked with red ink to record construction changes and as-built conditions.
- 2. A copy of each addendum and each change order in three-ring binder(s) (match binders specified for Operations and Maintenance Data). Include the Field Authorizations and/or Change Order Proposals directly behind each Change Order. Insert a labeled, tabbed divider for each Addendum and Change Order. Label front cover and spine of binder as follows:

Record Addendums & Change Orders
 South Kitsap Regional Park: Phase 1C
 Prepared by *(name of Contractor)*
(Date)

D. Computer Aided Drafting (CAD) Generated Contract Drawings and Contractor-Design Drawings:

- 1. Landscape Architect will provide Contractor with a CD-ROM containing the Contract Bid Drawings formatted as AutoCAD .dwg electronic files. Contractor shall obtain CAD electronic drawing files for CAD generated subcontractor-designed system from subcontractor responsible.
- 2. Using AutoCAD drafting software, transfer all information required to be recorded on the record drawings during construction into the CAD electronic Drawing file for each Contract Bid Drawing. Using an unused layer titled "Record Drawing", cloud and flag each changed condition and note "Record Drawing" in the revision box with the completion date. Add the following text box at the bottom right corner of each Drawing:

RECORD DRAWING
 This record drawing represents the as-constructed condition as derived from the undersigned Contractor's records and measurements. This information shall be used only in conjunction with field verification in that modifications and ongoing maintenance by others may have altered this record information.
 BY: _____ (Insert Contractor's Name) _____ Date: _____
 _____ (Insert Contractor's Address) _____

3. Transfer the revised record drawing files onto a CD-Rom (Auto-CAD .dwg files) and permanently label CD-Rom as follows:

Record Drawings

South Kitsap Regional Park: Phase 1C
Prepared by *(name of Contractor)*
(Date)

4. Submit three (3) bound, full-size sets of Xerox prints on 20 lb. white paper copied from the CD-ROM Record Drawings and the reviewed paper shop drawings.
5. Submit prior to Final Application and Certificate for Payment.
6. Pay all CAD drafting, printing and binding costs.

1.07 CITY APPROVED PERMIT DRAWING SET

- A. Transmit the city approved Permit Set of drawings to the Owner for their permanent record.
- B. Maintain Permit Set of drawings in good, clean condition, protect from damage or marks.

1.08 OPERATION AND MAINTENANCE DATA

- A. Prepare three (3) complete sets of Operation and Maintenance Data Binders prior to Substantial Completion, typed on 8-1/2 x 11 inch text pages, bound in black trapezoid-type three ring binder.
 1. Binders shall have durable plastic covers, heavy duty metal rings, metal piano hinges, rounded steel backs with label holders and be similar to Dennison National Brand Series 98 binders.
 2. All binders shall be same manufacturer, size and color where more than one binder is required.
- B. Prepare binder covers (front cover and spine label) with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
 1. When more than one volume is required, identify the volume number (e.g. Volume 1 of 3).
- C. Internally subdivide the binder contents with permanent page dividers similar to Avery PI Series dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified. Type on 30 lb. white paper.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Landscape Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers. Name and signature of Owner's representatives instructed in operation of equipment. Extra parts listing with signature of Owner's representative acknowledging receipt.
- F. Part 2: Operation and maintenance instructions arranged by system and subdivided

by specification section. For each category identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:

1. Product data and any shop drawings of 11" x 17" size or smaller.
 2. Significant design criteria.
 3. List of equipment.
 4. Parts list for each component.
 5. Operating instructions.
 6. Maintenance instructions for equipment and systems.
 7. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 8. Certificates required by specification sections.
 9. Guaranty and Warranty documentation (fully executed as applicable).
- G. Submit one copy of completed volumes in final form to Landscape Architect/Engineer for review at least 30 calendar days prior to Substantial Completion.
1. This copy will be returned with Landscape Architect/Engineer comments within 2 weeks.
 2. Revise content of documents in accordance with Landscape Architect/Engineer review comments prior to final submittal.
- H. Submit final revised volumes by Substantial Completion date.

1.09 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
- B. Deliver to project site and place in location as directed. Obtain receipt signed by Owner's representative prior to final payment and include receipts in Part 1 of Operation and Maintenance binders.

1.10 PUNCH LISTS

- A. Contractor's Punch List: Prior to Substantial Completion, the Contractor shall inspect the completed work and prepare a punch list of uncompleted, unacceptable or missing work.
1. Punch list shall be typewritten on 8-1/2"x11" paper and organized in numerical order by each room/area and building system.
 2. Punch list shall identify name of Subcontractor/Supplier responsible for correcting each item.
 3. Contractor shall not request Landscape Architect's punch list review until all items on Contractor's punch list have been completed.
 4. Upon completion, send copy of punch list showing completion of all items to the Landscape Architect.
- B. Landscape Architect's Punch List: Upon completion of the Contractor's Punch List and prior to Substantial Completion, the Contractor shall provide written notification to Landscape Architect that the Work is completed and request the Landscape Architect provide a punch list review.
1. Any notification to Landscape Architect of completion of the Work shall be accompanied by a copy of the Contractor's Punch List showing that all items have been satisfactorily completed.

2. Allow sufficient advance notice to allow the Landscape Architect and Consultants to schedule time for the Punch List review.
 3. Landscape Architect and Consultants will review the work and prepare a Punch List of any deficiencies in the Work for correction by the Contractor.
 4. Upon receiving the Landscape Architect's Punch List, the Contractor shall immediately notify the Landscape Architect of any disputed items, otherwise the Punch List deficiencies will be corrected as written.
- C. Punch List Re-Review Fees: The project budget provides for two final visits to the project site by the Landscape Architect/Engineer. The first will be in response to the Contractor's notice of substantial completion of the Work and if necessary, the second will be after notification by the Contractor that all punch list items and deficiencies noted during punch list review have been corrected.
- D. Should additional reviews by the Landscape Architect/Engineer be required due to the Contractor's failure to correct all deficient work, the Owner will deduct the amount of Landscape Architect/Engineer compensation for re-review services from final payment to Contractor.

1.11 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to Landscape Architect.
- B. Reflect all adjustments to Contract Sum. Indicate following:
1. The Original Contract Sum;
 2. Additions and deductions resulting from:
 - a. Previous change orders;
 - b. Alternates;
 - c. Unit price adjustments;
 - d. Deductions for uncorrected work;
 - e. Deductions for liquidated damages;
 - f. Deductions for additional review services;
 - g. Other adjustments;
 3. Total Contract Sum, as adjusted;
 4. Previous Payments; and
 5. Sums remaining due.
- C. Prior to processing of Final Application and Certificate for Payment, all Closeout Documents including Project Record Documents, Operations and Maintenance Manuals and Warranty Binders must be submitted, reviewed and accepted by the Landscape Architect.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

**END OF SECTION
SECTION 02 1725**

EXISTING SITE UTILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including Division 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Shutdown requirements for existing utilities/systems.
- B. Location, identification and protection of existing public and private site utilities.

1.03 GENERAL

- A. The Contractor shall, as part of the work of this contract, locate, identify and protect the existing site utilities wherever earthwork is performed for this project.
- B. The Owner will not provide any utility location service for existing utilities and assigns this responsibility to the Contractor.
- C. The Contractor is responsible for locating all utilities, whether public or private.

1.04 SHUTDOWNS OF EXISTING UTILITIES

- A. Continuity of existing utilities serving adjacent offsite areas shall be maintained for the duration of the Project. Utility shutdowns required to facilitate construction work shall be accomplished by utility owner; or, by Contractor, when approved or directed by utility owner, in accordance with the following requirements:
 - 1. Equipment and utility shutdowns shall be scheduled during times dictated by the utility owner.
 - 2. Schedule shutdown of utilities with the utility owner in advance of shutdown.
 - 3. Confirm requests for utility shutdowns in writing to the utility owner.
 - 4. The duration of shutdowns shall be held to maximum approved by utility owner.
 - 5. Materials and equipment required for the work to be accomplished during shutdown shall be complete and available on the job for review by utility owner on the day prior to the shutdown, if requested. If Contractor is not adequately prepared, the shutdown will be canceled and rescheduled.
 - 6. When requested by utility owner, the utility owner's personnel will take the responsibility for shutting down and restarting utilities.

1.05 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Contractor shall determine safe excavation and dewatering methods, monitor

excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.

3. It is not the intent of the Construction Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods for achieving the work of this section conforming to their safety plan as required to locate and protect existing utilities.

PART 2 - PRODUCTS

2.01 EXCAVATION EQUIPMENT FOR POT HOLING

- A. Excavation Equipment: Contractor shall select the most appropriate equipment for pot-holing excavation including the following:
 1. Hand Excavation: Use hand shovel for excavating active utilities that must be protected from damage and maintained operational.
 2. Machine Excavation: Backhoe; not suitable for pot holing active utilities that must be protected from damage and maintained operational: Caution: Do not pot hole for active gas or electrical lines with a backhoe or other power machinery.
 3. Hydro Excavation Equipment: High capacity, truck-mounted unit having the following equipment and capabilities:
 - a. High capacity, high pressure water pump and jetting equipment, including hoses, probes and heads required for high speed hydro excavation in the soil types and conditions found on project site.
 - b. High capacity bulk debris wet vacuum and collection tank capable of sucking the soil and water muck away from the existing underground utility without damage to the utility.
 - c. Operator personnel experienced in the safe and proper operation of the equipment.

PART 3 - EXECUTION

3.01 EXISTING UTILITIES LOCATION, IDENTIFICATION AND PROTECTION

- A. This site contains both public and private existing utilities:
 1. Public Utilities: Utilities owned and operated by utility companies who have either a franchise or contract to provide service to a given area.
 2. Private Utilities: Utilities owned and operated by a private entity.
 3. The majority of the utilities on this site are private utilities requiring a private utility location service to be employed (the public utility location service that responds to calls placed to (800) 424-5555 will not locate private utilities).
- B. The public street right of way fronting this site contains utilities owned and operated by Kitsap County and utility companies who have either a franchise or contract to provide service to this area.
- C. Utilities of record are shown on the Drawings insofar as possible to do so. These, however, are shown for convenience only and the Owner and Architect/Engineer assume no responsibility for improper locations or failure to show existing utility locations on the Drawings. The Contractor is responsible for determining the location of existing utilities prior to commencing work.
- D. **Prior to excavation/construction work** the Contractor shall:

1. Public Utilities: Call underground utility locate service and request utility locations be marked in areas to be excavated at least 48 hours prior to starting excavation work. After utilities have been located and marked, carefully expose the utility by excavation wherever the work of this contract will uncover or cross an existing utility.
 - a. Contractor shall determine, with the help of the underground utility locate service, what building or area each utility serves.
2. Private Utilities: Locate existing utilities using the method appropriate for the type of utility, including, but not limited to, any of the various types of electronic locators, flow testing, smoke bombs, dye, witching, and pot holing (excavation) methods.
 - a. Use of a private underground utility location service with electronic locating equipment is acceptable provided Contractor confirms the electronic locations by carefully exposing the utility by excavation wherever the work of this contract will uncover or cross an existing utility.
 - b. The Contractor shall locate, identify and protect existing private utilities whether shown on the Drawings or not.
 - c. Contractor shall determine what building or area each utility serves.
 - d. Locate, pothole, expose and take measures to protect any existing utilities that cross through or could potentially be exposed by the excavation or trenching work of this project.
 - e. If existing utilities are found that are not shown on the Drawings, determine whether they are active or abandoned. If active, determine what areas/buildings they serve and mark their location in the areas affected by the work of this project.
3. Pot Holing Method: Utilize the most appropriate equipment as specified in Part 2 of this section so that existing utility is exposed without damage.
4. Locate and mark shutoff valves, vaults, catch basins and other control structures/devices which are a part of the underground utilities within the work area or that control utilities within the work area.
5. Confirm exact location, depth and grade of existing underground utilities by uncovering short sections of each utility wherever the work of this contract will uncover or cross an existing utility.
6. Inform Utility purveyor of schedule for work as it will directly affect each utility, for utilities that will be shut down and for utilities that will remain in operation during earthwork operations.
7. Make arrangements to have materials and fittings and equipment required to make immediate repair to any utility that is inadvertently damaged during earthwork operations.
8. Provide temporary cover over, or barrier fence around, any excavations left open to prevent any unsafe or hazardous condition for workers or the public.

E. During excavation/construction work the Contractor shall:

1. Make provisions for the immediate containment, collection, pumping and shut off (as appropriate) for utility lines known or suspected to be in the area to prevent damage to the site or wildlife and to adjacent properties, streams or bodies of water.
2. Provide a shut-off key on each valve on pressurized lines that are located within the excavation work area to allow immediate shut off of any pressurized utility line accidentally damaged during excavation. Remove the shut-off key at end of each work day to prevent unauthorized use. Test the existing valve for proper

- operation (with utility provider present if required) prior to starting excavation work.
3. Protect and maintain utilities in operational condition during construction; provide temporary pumps, supports, shoring, etc. required to maintain utility operational during the construction work until the utility can be rerouted and/or abandoned.
 4. If existing utilities are uncovered that are not shown on the Drawings, advise the Architect and Owner immediately and protect utility from damage; determine whether utility is active or abandoned.
- F. Repair any utilities damaged by construction operations immediately using materials and methods of the type approved or recommended for the specific use required and equal to or exceeding the existing materials/condition at the Contractor's expense.
- G. As-Built Drawings: Show the actual locations of each utility uncovered.
- H. Pot Hole Excavation Backfill: Fill and compact any pot hole excavations with structural fill in accordance with requirements in Section 31 2333.

END OF SECTION

**SECTION 03 1000
CONCRETE FORMWORK FOR SITE WORK**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 DESCRIPTION

- A. Construct all formwork systems to provide only those lines and delineations indicated, unless otherwise approved by the Engineer, construct formwork to allow erection in proper sequence and to permit removal without damage to the finished concrete surfaces. Construct all formwork to the shapes, lines and dimensions of concrete members with specified tolerances.

1.03 REGULATIONS

- A. Conform to requirements of Kitsap County Building Code for concrete, as supplemented and modified herein.

1.04 REFERENCE STANDARDS

Conform to requirements of the following Reference Standards as the Engineer judges them applicable and as modified and supplemented herein.

- A. ACI Specifications for Structural Concrete for Buildings, ACI 301.
- B. ACI Recommended Practice for Concrete Formwork, ACI 347.

1.05 RELATED SECTIONS

Section 12 9300 - Site Furnishings

1.06 QUALITY ASSURANCE

- A. Special Inspection: Notify the Engineer at least 48 hours before inspection of forms will be required.
- B. Inspection by Other Trades: Where items, such as anchors, fastenings, conduit, piping and other items are supplied by other trades and specified elsewhere in these specifications, in the forms, obtain approval of their placement prior to placing any concrete.

1.07 HANDLING

- A. Protection of Forms: Design, construct, and erect all forms for reuse; withdraw projecting nails or other objects from contact surfaces before reusing; clean and

completely recondition all forms prior to reuse; repair any damage to forming surfacing cause during previous usage. Obtain approval for each reuse; formwork with patches or repairs affecting appearance of the concrete surfaces will not be permitted.

- B. In order that reused forms will not contain patches resulting from alterations, reuse forms on identical sections only; reuse no forms showing excessive surface wear or other imperfections impairing quality of finish of concrete surface.
- C. Precautions: Contractor is responsible for the strength and suitability of the formwork.

PART 2 - PRODUCTS

2.01 FORMS

For Footings and Concrete Slabs: Fabricate forms of MDO plywood, metal or plastic as judged best suited for shapes. Construct with a minimum of joints, sufficiently tight to prevent leakage.

2.02 INSERTS/SLEEVES

- A. As required by Manufacturer's specifications.

2.03 FORM RELEASE AGENTS

- A. Release agent with non-staining and non-interference characteristic with bonding capabilities of paints, plasters, adhesives, other surface coatings or materials. Contractor shall guarantee proper bonding of such subsequent coatings or materials applied over concrete.

PART 3 - EXECUTION

3.01 DESIGN AND CONSTRUCTION

- A. Erect forms to conform accurately to the shapes, dimensions, locations and profiles indicated; fit joints between adjacent assembled panels and components tightly and seal with gasket material. Inspect all contact surfaces prior to concrete placement; verify that surfaces are clean, smooth, and free from foreign matter or imperfections affecting appearance of finished concrete.
- B. Camber: Design and erect formwork for anticipated deflection due to weight and pressure of fresh concrete. Provide positive means for adjustment of shores and struts to take up settlement during placement.

3.02 FORM TREATMENTS

Before erection of forming, plug and seal all cracks, holes, slits, gaps and other "telegraphing" imperfections in contact surfaces. Apply bond-breaking coating in amounts that will leave surfaces in proper condition to receive subsequent material application. Contractor shall be responsible for being certain that bond release coatings are applied only in amounts that will leave surfaces in proper condition to receive subsequent material application.

3.03 FORM REMOVAL

A. Formwork designed for easy removal without damaging or marring finished surfaces of the concrete. Prying against face of concrete will not be permitted; where mechanical means are necessary to release forms, use wood wedges only and then only if approved by the Engineer.

B. Removal Strength: Formwork for footings shall remain in place until concrete has hardened sufficiently to resist damage from the removal operations. Determine concrete removal strength based on test cylinders, field cured under the most unfavorable conditions prevailing for any portion of the work represented, or as approved by the Engineer.

END OF SECTION

**SECTION 03 2000
CONCRETE REINFORCEMENT**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- B. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all concrete reinforcement related to the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. Provide all steel reinforcement for construction of Portland Cement Concrete works for the skate park.
- C. Related Work:
 - 1. Section 03 20 00 – Concrete Reinforcement
 - 2. Section 03 30 00 – Cast-In-Place Concrete
 - 3. Section 03 37 13 – Shotcrete

1.03 REFERENCES

- A. Comply with the applicable reference specifications as specified in the General Conditions and in accordance with applicable laws, codes and regulations required by Kitsap County.
- B. Comply with the current provisions of the following Codes and Standards:
 - 1. ASTM - American Society for Testing and Materials.
 - 2. Standard Specifications – Agency Specified
 - 3. Uniform Building Code
- C. American Concrete Institute (ACI):
 - 1. ACI 315-80, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
 - 2. ACI 318-77, Building Code Requirements for Reinforced Concrete.
- D. American Society for Testing and Materials (ASTM - latest editions):
 - 1. ASTM A233 - Mild Steel Arc Welding Electrodes.
 - 2. ASTM A615 - Deformed Billet-Steel Bars for Concrete Reinforcement.
 - 3. ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
 - 4. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.
- E. Concrete Reinforcing Steel Institute (CRSI): Manual of Standard Practice, latest edition.

- F. American Welding Society (AWS): Reinforcing Steel Welding Code, D12.1-75, including latest revisions.

1.04 DELIVERY AND STORAGE

- A. Store materials in dry and protected locations and protect from damage. Stack reinforcing steel in staggered tiers. Mark each length, size, shape and location. Maintain reinforcement free of dirt, mud, paint or rust.

1.05 SUBMITTALS

- A. In accordance with Section 01 3300
- B. Shop Drawings: Indicate complete reinforcing method for each concrete member including materials, sizes, bends, dimensions, stirrup spacing, and placing details not shown on drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Steel Reinforcement: Conforming to ASTM A615, Grade 60, clean and free of rust, dirt, grease or oils.
- B. Welded Steel Reinforcement: Deformed low-alloy steel, ASTM A706, carbon content not exceeding 0.30% and manganese content not exceeding 0.60%. Identify and tag with manufacturer's heat identification number.
- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars in place.

2.02 FABRICATION

- A. Fabricate to sizes, shapes, and lengths detailed in accordance with requirements of ACI 318-71 and ACI 315-65.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover over reinforcement.
- D. Accurately place reinforcing steel in accordance with drawings. Thoroughly clean reinforcement of any coating which would reduce bonding. Do not heat, cut, or bend

bars without Landscape Architect's approval. Do not splice reinforcement at points of maximum stress. Stagger splices in adjacent bars and provide a minimum overlap of 30-bar diameters at splices unless specifically noted otherwise on Drawings.

- C. Securely saddle tie intersections with No. 18 gauge black annealed wire. Rigidly secure reinforcement in place. Provide concrete coverage as shown on Drawings.

3.02 WELDING REINFORCEMENT

- A. Weld deformed steel reinforcement bars in strict accordance with AWS 12.1, using recommended pre-heat temperature and electrode for type of steel being welded.
- B. Do not weld steel reinforcement bars without proper heat identification of bars.

3.03 CLEANUP

- A. Upon completion of the concrete reinforcement work, remove surplus construction materials, loose earth, trash and debris so that the job site is left in a neat and orderly condition.

END OF SECTION

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 2 and 1 Specification Sections, apply to work of this Section.

1.02 SPECIALTY SKATE PARK CONSTRUCTION

- A. Work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section and have been pre-qualified may perform this work as specified herein.

1.03 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all Portland Cement Cast-In-Place Concrete related to the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. Related Work:
 - 1. Section 03 1000 – Concrete Formwork
 - 2. Section 03 2000 – Concrete Reinforcement
 - 3. Section 03 3713 – Shotcrete
 - 4. Section 03 3900 – Concrete Curing

1.04 REFERENCES

- C. Comply with the applicable reference specifications as specified in the General Conditions and in accordance with applicable laws, codes and regulations required by Kitsap County. Comply with the current provisions of the following Codes and Standards:
- D. ASTM - American Society for Testing and Materials:
 - 1. ASTM C33 – Concrete Aggregates.
 - 2. ASTM C94 – Ready-Mixed Concrete.
 - 3. ASTM C143 – Test for Slump of Portland Cement Concrete.
 - 4. ASTM C150 – Portland Cement.
 - 5. ASTM C260 – Air-Entraining Admixtures for Concrete.
 - 6. ASTM C494 – Chemical Admixtures for Concrete.
 - 7. ASTM C618 – Fly Ash and Raw or Calcined Natural Pozzolans for Use in Portland Cement Concrete
 - 8. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.
- E. ACI – American Concrete Institute:
 - 1. ACI 211.1-81 – Recommended Practice for Selecting Proportions for Normal-Weight Concrete.

2. ACI 211.3-81 – Recommended Practice for Selecting Proportions for Lightweight Concrete.
 3. ACI 301 – Specifications for Structural Concrete for Buildings.
 4. ACI 305 – Recommended Practice for Hot Weather Concreting.
 5. ACI 306 – Recommended Practice for Cold Weather Concreting.
 6. ACI 318 – Building Code Requirements for Reinforced Concrete.
- F. UBC – Uniform Building Code
- G. AWS – American Welding Society
1. AWS 3.0-41 – Standard Qualifications Procedure.
 2. AWS D1.4 – Structural Welding Code – Reinforcement.
 3. AWS D12.1-61 – Reinforced Concrete Construction.
- H. CRSI – Concrete Reinforcing Steel Institute: MSP-1 – Manual of Standard Practice

1.05 SUBMITTALS

- A. Design of Concrete Mixes:
1. Contractor shall be responsible for and pay for design of concrete mixes. Design of concrete mixes shall be performed by a Testing Laboratory selected by Contractor and approved by the consultant. Design methods to be in accordance with ACI 318-71.
 2. Make three trial mixes using aggregate proposed.
 3. Make advance tests of trial mixes with proposed materials. Test four cylinders in accordance with ASTM C 39 at 7 days and 28 days. Do not place concrete on project until laboratory reports and breaks of confirmation cylinders indicate that the proposed mixes will meet the strength requirements as indicated on the Drawings.
 4. Check mix design and revise, if necessary, wherever changes are made in aggregate or in surface water content of aggregate or workability of concrete. Slump shall be the minimum to produce workable mix. Laboratory shall prescribe minimum quantity of water.
 5. If Portland Cement reducers or other additives are used, submit control mix design without reducers or additives as well as mix exactly proposed to be used. Submit W.R. Grace Co. recommendations for retarder and shrinkage compensation of slab on grade.
 6. Sample of Workmanship: Provide on site, minimum 48"x48" sample (not part of finished project) of each flatwork finish.
 7. Forward one copy of design mix to consultant for approval. Email PDF where appropriate.
- B. Submit product data and manufacturer's instructions for:
1. Color admixture.
 2. Expansion joint fill material.
 3. Curing compound.
 4. Dowel aligners/caps.
 5. Waterstop.
 6. Crack repair materials.
 7. Form facing materials.
 8. Form release agents.
 9. Proprietary cleaning agents.

- 10. Plastic film for curing.
- 11. Surface retarders.

- C. Samples:
 - 1. Samples for Color Selection: Submit color additive manufacturer's color chart & sample chip set; indicate color additive number and required dosage rate. Samples indicate general color and may vary from concrete finished in field according to Specifications.
 - 2. Expansion Joint Fill Material: Submit one 12-inch length.

- D. Test Reports: Compressive strength of concrete test cylinders taken upon delivery of concrete.

- E. Delivery Documentation: Batch tags for each load of concrete, for informational purposes.

1.06 QUALITY ASSURANCE

- A. Pre-Bid Conference: Prior to submitting bid, attend pre-bid conference with consultant to review mock-up requirements and artistic effect desired.

- B. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.

- C. Contractor Mock-Ups:
 - 1. Contractor shall prepare 4-foot x 4-foot mock-ups for each paving type indicated on Drawings, prior to installation.
 - 2. Mock-Ups shall be completed to the satisfaction of the consultant and Owner including aggregates, texture, color, and finishes.
 - 3. These mock-ups will become the standard of quality by which future paving samples and work will be judged.
 - 4. Mock-Ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If mock-ups are damaged or removed, Contractor shall repair/replace in-kind immediately.

- D. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

- E. Contractor Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references.

- F. Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.

- G. ACI Requirements: Meet all requirements of ACI 301.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store materials in dry and protected locations and protect from damage.
- B. Do not change brand of cement or source of aggregate during course of Work.

1.08 SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Submit plan to monitor wind velocity, relative humidity, temperature, and concrete temperature in order to maintain specified maximum rate of evaporation.
 - 2. Do not place concrete when sub base surface temperature is less than 40 degrees F, nor when surface is wet.
 - 3. Protect concrete against extreme cold and heat, frost, rapid drying, and damage by rain.
- B. Coordination:
 - 1. Coordinate schedules of concrete placement to allow adequate time for installation of other related work.
 - 2. Verify that anchor bolts and other embedded steel items to be cast into concrete are properly placed.
 - 3. Coordinate size and location of mechanical and electrical equipment concrete pads.
 - 4. Coordinate earthwork and soils report requirements with placement requirements.
 - 5. Coordinate with form-work and finishes sections to provide finish floor levelness and flatness as specified herein. Slope to drains at grades and percent slope shown on contract documents.
 - 6. Ensure that irrigation sleeves, electrical conduit, drainage lines and other utility elements are accommodated and as-built located prior to placing concrete.

1.09 WARRANTY

- A. General Description: In addition to manufacturer's warranties, warrant Work for a period of one year from the Date of Final Completion against defects in materials and workmanship.
- B. Additional Items Covered: Warranty shall also cover repair of damage to other materials and workmanship resulting from defects in materials and workmanship.
- C. Exceptions: Contractor shall not be held responsible for failures due to ordinary wear, neglect by Owner, vandalism, or other causes beyond the Contractor's control.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Ready Mixed Concrete: Batched, mixed and transported in accordance with ASTM C 94 – Specifications for Ready Mixed Concrete.

- B. Portland Cement: Refer to Drawings for specific paving type and finish required and conform to ASTM C-150, Type II. Use same brand of cement from single source throughout entire project for each paving type.
- C. Fine Aggregate (washed concrete sand): Clean, hard, durable, uncoated washed natural sand, free from silt, loam or clay, and conforming to ASTM C 33.
- D. Coarse Aggregate: Clean, hard, durable, un-coated coarse aggregate conforming to ASTM C33. Use same coarse aggregate from single source throughout entire project.
- E. Water: Potable and free from deleterious materials such as oils, acids, and organic matter.
- F. Admixture: Cement-dispersing, water-reducing compound, ASTM C 494, Type A, as made by Master Builders, Sika, or Gifford-Hill Co., or equal. Depending upon weather conditions at time of placing, ASTM C 494, Type D (water-retarding) or Type E (water-reducing, accelerating) may be used if approved by Owner's Representative.

2.02 PROPORTIONS AND MIXING

- A. Proportions and Design: In accordance with approved mix design. Minimum allowable compressive strength at 28 days is 4000 psi.
- B. Admixture: No admixtures without approval. Introduce admixtures in quantities and according to methods recommended by admixture manufacturer. Add air-entraining agent to concrete as scheduled.
- C. Slump: Not to exceed 3 ½”
- D. Mixing: Ready mixed concrete in accordance with ASTM C-94. Do not transport or use concrete after 1-1/2 hours have elapsed from time of initial mixing. Supplier of transit-mixed concrete shall have a plant of sufficient capacity, and adequate transportation facilities to assure continuous delivery at required rate, to provide continuous concrete placement throughout a pour.
- E. Grout and Dry Pack: Non-Shrink, Non-Metallic: U.S. Grout Corp. “Five Star Grout” ASTM C-877, C-191, and C-109, 5,000 PSI.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect subgrade, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, and other work required to be built into concrete and report any discrepancies. Notify Owner’s Representative at least 5 working days in advance of scheduled placement.
- B. Correct unsatisfactory work prior to placing concrete.
- C. Remove rubbish from formwork immediately prior to placing concrete.

3.02 INSTALLATION

- A. Placing Concrete:
 - 1. Convey and place concrete allowing no separation of ingredients in accordance with ACI 304 and as specified below.
 - 2. Maximum height of concrete free fall - five feet.
 - 3. Regulate rate of placement to maintain plasticity and flow into position.
 - 4. Deposit concrete continuously until panel or section is completed.
 - 5. Place concrete in horizontal layers 18" maximum thickness.

- B. Consolidation:
 - 1. Use mechanical vibrating equipment for consolidation.
 - 2. Vertically insert and remove hand-held vibrators at 18" O.C. for 10 to 15 seconds.
 - 3. Do not use vibrators to transport concrete in forms.
 - 4. Provide vibrators with minimum speed of 8000 RPM and with amplitude to consolidate effectively.
 - 5. Thoroughly consolidate concrete and work around reinforcement, embedded items and into corners of forms. Thoroughly consolidate layers of concrete with previous layers.

- C. Construction Joints:
 - 1. Unless otherwise shown on Drawings, each footing, wall, beam, and slab shall be considered as a single unit of operation and shall be monolithic in construction.
 - 2. Where construction joints are absolutely unavoidable, locate joints at or near quarter points of spans where approved by consultant and/or shown on plan.
 - 3. Saw Cut joints, Expansion Joints and Key Joints as detailed in contract documents.

- D. Expansion Joint Fillers:
 - 1. Refer to Drawings for Expansion Joint locations and details.
 - 2. Finish joint material flush with concrete surface.

- E. Hot Weather Placement:
 - 1. Prevent high temperature in fresh concrete during hot weather in accordance with ACI 305.
 - 2. Use water reducing set retarding admixtures in such quantities as especially recommended by manufacturer to assure that concrete remains workable and lift lines will not be visible.

- F. Flatwork:
 - 1. Cast slabs-on-grade in alternate sections, unless permanent forms are used. Wait 48 hours between all adjacent concrete castings.
 - 2. Plane Surface Tolerance: Exterior- Class AX, 3/16" in 10' with no ponding.
 - 3. Maximum 1:500 slope from indicated plane at any point.

- G. Finish:
 - 1. Smooth Trowel finish to match approved Mock-Up finish.

2. After surface water disappears and floated surfaces have sufficiently hardened, steel trowel then retrowel the surface to a smooth and consistent finish.
 3. After concrete has set enough to provide edge troweling, retrowel edges to a smooth and uniform finish.
- H. Cracking:
1. Cracking from inadequate curing is not allowed. Sawcut joints and construction joints are shown on drawings. Contractor may, with approval of consultant, recommend and detail other joints required to prevent cracking.

3.03 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, defective, or does not meet the requirements of this Section or conformance with ASTM F 2480 - Standard Guide for In-ground Skate Parks.
- B. Protect concrete from damage until Final Payment. Exclude traffic from paving for at least 28 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete paving free of stains, discoloration, dirt, wax, and other foreign material until Final Payment.

3.04 CLEAN-UP

- A. At completion of Work, remove concrete stains from adjacent work, including but not limited to dissimilar paving types, walls, columns, railing posts, light fixtures, plant materials, to satisfaction of consultant.

END OF SECTION

**SECTION 03 3713
SHOTCRETE**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SPECIALTY SKATE PARK CONSTRUCTION

- A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section and have been pre-qualified may perform this work as specified herein.

1.03 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all Shotcrete related to the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. Refer to Drawings for specific locations of shotcrete.
- C. Related Work:
 - 1. Section 03 10 00 – Concrete Formwork
 - 2. Section 03 20 00 – Concrete Reinforcement
 - 3. Section 03 30 00 – Cast-In-Place Concrete
 - 4. Section 03 39 00 – Concrete Curing
 - 5. Section 05 50 00 – Metal Fabrications

1.04 REFERENCES

- A. Comply with the applicable reference specifications as specified in the General Conditions and in accordance with applicable laws, codes and regulations required by the Kitsap County. Comply with the current provisions of the following Codes and Standards:
- B. ASTM - American Society for Testing and Materials:
 - 1. ASTM C33 – Concrete Aggregates.
 - 2. ASTM C39 – Test Method of Compressive Strength of Cylindrical Concrete Specimens.
 - 3. ASTM C94 – Ready-Mixed Concrete.
 - 4. ASTM C143 – Test for Slump of Portland Cement Concrete.
 - 5. ASTM C150 – Portland Cement.
 - 6. ASTM C260 – Air-Entraining Admixtures for Concrete.
 - 7. ASTM C494 – Chemical Admixtures for Concrete.
 - 8. ASTM C979 – Pigments for Integrally Colored Concrete.
 - 9. ASTM C618 – Fly Ash and Raw or Calcined Natural Pozzalans for Use in Portland Cement Concrete.
 - 10. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.

- C. ACI – American Concrete Institute:
 1. ACI 211.1-81 – Recommended Practice for Selecting Proportions for Normal-Weight Concrete.
 2. ACI 211.3-81 – Recommended Practice for Selecting Proportions for Lightweight Concrete.
 3. ACI 301 – Specifications for Structural Concrete for Buildings.
 4. ACI 305 – Recommended Practice for Hot Weather Concreting.
 5. ACI 306 – Recommended Practice for Cold Weather Concreting.
 6. ACI 318 – Building Code Requirements for Reinforced Concrete.

- D. IBC – International Building Code

- E. AWS – American Welding Society
 1. AWS 3.0-41 – Standard Qualifications Procedure.
 2. AWS D1.4 – Structural Welding Code – Reinforcement.
 3. AWS D12.1-61 – Reinforced Concrete Construction.

- F. CRSI – Concrete Reinforcing Steel Institute: MSP-1 – Manual of Standard Practice

1.05 SUBMITTALS

- A. Manufacturer's Data: Current printed specifications with application and installation instruction for proprietary materials including concrete admixtures.

- B. Shop Drawings: Radial templates cut to exact radii shown on drawings to insure exact radii from flat bottom of skate park to face of coping. Template shall be fabricated from steel or $\frac{3}{4}$ " Plywood.

- C. Design of Concrete Mixes:
 1. Contractor shall be responsible for and pay for design of concrete mixes for each type of concrete specified. Design of concrete mixes shall be performed by a Testing Laboratory selected by Contractor and approved by the Owner. Design methods to be in accordance with ACI 318.
 2. Make three trial mixes using aggregate proposed.
 3. Make advance tests of trial mixes with proposed materials. Test four cylinders in accordance with ASTM C-39 at 7 days and 28 days. Do not place concrete on project until laboratory reports and breaks of confirmation cylinders indicate that proposed mixes will develop required strengths.
 4. Check mix design and revise, if necessary, wherever changes are made in aggregate or in surface water content of aggregate or workability of concrete. Slump shall be the minimum to produce workable mix. Laboratory shall prescribe minimum quantity of water.
 5. If Portland Cement reducers or other additives are used, submit control mix design without reducers or additives as well as mix exactly proposed to be used. Submit W.R. Grace Co. recommendations for retarder and shrinkage compensation of slab on grade.
 6. Sample of Workmanship: Provide on site, minimum 48"x48" sample (not part of finished project) of each flatwork finish and color.
 7. Forward two copies of design mix to consultant for approval.

- D. Submit product data and manufacturer's instructions for:
 - 1. Color admixture.
 - 2. Expansion joint fill material.
 - 3. Curing compound.
 - 4. Dowel aligners/caps.
 - 5. Waterstop.
 - 6. Crack repair materials.
 - 7. Form facing materials.
 - 8. Form release agents.
 - 9. Proprietary cleaning agents.
 - 10. Plastic film for curing.
 - 11. Surface retarders.

- E. Shotcrete Sample:
 - 1. Provide representative samples of materials for material testing, mix proportion testing, and finish.
 - 2. Provide onsite, minimum (1) 6' x 6' x 6" sample (not part of finished project) of shotcrete with a radius and the same reinforcement and coping as the highest elevation and largest radii on the project for finish inspection and approval.

- F. Placement Schedule:
 - 1. Contractor to indicate on plans the locations to be shot within a day's work and not exceeding 40 cubic yards per day for quality control and inspection schedules.
 - 2. Schedule and sequence to be reviewed and approved by Owner's Representative prior to starting this Work.

- G. Test Reports: Compressive strength of concrete test cylinders taken upon delivery of concrete.

- H. Delivery Documentation: Batch tags for each load of concrete, for informational purposes.

1.06 QUALITY ASSURANCE

- A. Work in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in as defined in 00 3000 Statement of Bidder Qualifications.

- B. Concrete Testing:
 - 1. Prepare test specimens by each application crew using the equipment, materials and mix proportions proposed for the Project. Owner's Representative shall observe preparation of test panels noting placement of shotcrete by applications crew.
 - 2. Test panel shall be at least 6' x 6' x 6" with the same reinforcement as in the proposed structure. A Testing Agency shall take at least three (3) cores from the specimen and test them in accordance with ASTM C42.

3. Secure and protect Test Panels during construction and test for compliance with Specifications.
 4. Test strength of the shotcrete as work progresses as follows:
 1. Cut cores from the structure and test in accordance with ASTM C42. A set of three (3) cores shall be taken not less than once each shift nor less than one for each 50 cubic yards of shotcrete placed through the nozzle. Cores shall be soaked in water for a minimum of 40 hours before testing.
 2. When the length of a core is less than twice the diameter, apply the correction factors given in ASTM C42 to obtain the compressive strength of individual cores. The average compressive strength of three cores taken from the structure, representing a shift or 50 cubic yards of shotcrete, must equal or exceed 0.85f'c with no individual core less than 0.75f'c.
 5. Shotcrete core grade 2 required.
- B. Acceptance: Final acceptance of the shotcrete will be based upon the results obtained from cores. A mean core grade of 2.5 or less is acceptable. Individual shotcrete cores with a grade greater than 3 are unacceptable. Use of data obtained from impact devices will not be permitted for final acceptance of the shotcrete. However, this data may be useful for determining uniformity of the shotcrete.
- C. Certification: Nozzleman certification shall be in accordance with ACI 506.3R
- D. Pre-Bid Conference (if applicable): Prior to submitting bid, attend pre-bid conference with Owner's Representative to review mock-up requirements and artistic effect desired.
- E. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.
- F. Contractor Mock-Ups:
1. Contractor shall prepare a mock-up for each paving type indicated on Drawings, prior to installation.
 2. Mock-Ups shall be completed to the satisfaction of the Architect, Landscape Architect, and Owner including aggregates, texture, color, and finishes.
 3. These mock-ups will become the standard of quality by which future paving samples and work will be judged.
 4. Mock-Ups to remain on-site and be protected during the course of construction, as a means to compare work in progress. If mock-ups are damaged or removed, Contractor shall repair/replace in-kind immediately.
- G. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- H. Contractor Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references.
1. Required Experience: Contractor or Subcontractor must have completed (5) public concrete skate park facilities with a minimum size of 30,000 square feet.

Parks must be open and in good operating condition for at least one year. Only those projects where the complete construction of the facility has been the sole responsibility of your firm will be considered acceptable projects.

2. Evidence of Experience: Contractor or Subcontractor shall submit to Architect satisfactory documentation of the aforementioned experience and qualification. If a Contractor cannot provide this information or if it is unverifiable, work under this Section and any other related Section cannot be completed by Contractor. This submission must contain the Project Name & Location, Owner's Name & Contact Information, Architect Name & Contact Information, Project Size, Contract Value, Completion Date, and Supervisor and/or Key Personnel responsible for this experience for each of the qualifying projects.

- I. Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.
- J. ACI Requirements: Meet all requirements of ACI 506, Chapter 13, Wet Method and Chapter 5, Shotcrete Crew.

1.07 DELIVERY, HANDLING, AND STORAGE

- A. Properly deliver and handle materials to prevent contamination, segregation or damage to materials.
- B. Store cement in weathertight enclosures to protect against dampness and contamination.
- C. Prevent segregation and contamination of aggregates by proper arrangement and use of stockpiles.
- E. Store admixtures properly to prevent contamination, evaporation, or other damage.
- F. Do not change brand of cement or source of aggregate during course of Work.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I or II, one brand only.
- B. Normal Weight Aggregates: ASTM C33 and as herein specified. Aggregate shall comply with gradation No. 2 as shown in ACI 506R Table 2.1. If the contractor can show satisfactory performance of an alternate grading under similar conditions of use, the Engineer may waive the requirement for gradation No. 2.
 - 1. Combined gradation of coarse and fine aggregate as follows:

<u>Sieve Size</u> <u>U.S. Standard</u> <u>Square Mesh</u>	<u>Percent by Weight</u> <u>Passing Individual Sieves</u>
3/8 in	90-100
No. 4	70-85
No. 8	50-70
No. 16	35-55
No. 30	20-35
No. 50	8-20
No. 100	2-10

2. Batch fine coarse aggregates separately to avoid segregation.
3. Aggregates shall be free from clay, mud, loam, or other deleterious substances.
4. Dune sand, bank run sand, and manufactured sand are not acceptable for fine aggregate.
5. Coarse aggregate shall be clean, un-coated, heavy media processed aggregate of crushed stone or river washed aggregate.

2.02 ACCESSORIES

- A. Water: Fresh, clean, potable, and free of deleterious acids, mixing, and curing water, as available from Owner. Transport as required.
- B. Admixtures: Use only accepted admixtures meeting the following requirements:
 1. Chemical Admixtures: ASTM C494
 2. Water reducing, retarding or accelerating admixtures shall conform to ASTM C.
 3. Air-entraining Admixtures: ASTM C1141. Air entraining prior to shooting shall be 7% with a +/- 1-1/2% tolerance.
 4. The use of Calcium Chloride shall not be permitted. The contractor shall submit details of proposed admixtures with the concrete mix design.
- C. Key-Joints: See Cast-In-Place Concrete - Section 03310.

2.03 PROPORTIONING AND DESIGN OF CONCRETE MIXES

- A. Mix: Prepare design mix to achieve an in-place 28 day compressive strength of 4,000 pounds per square inch and an air content of 4% at 28 days. Maximum aggregate size shall not exceed 3/8 inch. Unit weight of in-place shotcrete shall be 494 pounds per cubic yard. Use an independent Testing Agency acceptable to the City to prepare and report the proposed mix design. Testing is at the cost of the contractor.
- B. Test Data: Submit for acceptance proportioning and test data from prior experience if available. If data from prior experience are not available or accepted, make and have tested specimens from three or more different mix proportions in accordance with pre-construction testing requirements of this Specification.
- C. Strength: Selected mix proportions on the basis of compressive strength tests of specimens shall be cut from the shotcrete test panels not earlier than 5 days after placing. For mix acceptance purposes, average core strengths shall be least equal

to f'c for cores with L/D of 2.0. For cores with L/D between 1.0 and 2.0, use correction factors given in ASTM C42.

- D. Review: Mix design shall be reviewed for acceptance by Consultant.

2.04 CONCRETE APPLICATION EQUIPMENT

- A. For Wet Mix Shotcrete:
 - 1. Mixing Equipment: Capable of thoroughly mixing aggregate, cement and water in sufficient quantity to maintain continuous placement.
 - 2. Ready-mixed Concrete: ASTM C94, except that it may be delivered to the site in the dry state if the equipment is capable of adding the water and mixing it satisfactorily with the dry ingredients.
 - 3. Air Supply: Clean air adequate for maintaining sufficient nozzle velocity for parts of work, and for simultaneous operation of blow pipe for cleaning away rebound.
 - 4. Delivery Equipment: Capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously through delivery hose.

PART 3 -EXECUTION

3.01 INSPECTION

- A. Examination: Examine concrete formwork and verify that it is true to line and dimension, adequately braced against vibration, and constructed to permit escape of air and rebound but to prevent leakage during shotcreting. Correct deficiencies.
- B. Inspection: Inspect reinforcement steel and items to be embedded in concrete. Correct any deviations from the accepted shop drawings.
- C. Notification: Notify other trades involved in ample time to permit the proper installation of their work. Cooperate in setting such work.
- D. Existing Surfaces: Examine existing concrete surfaces for unsound material. Correct deficiencies.

3.02 PREPARATION FOR INSTALLATION OF CONCRETE

- A. Forms: Use a form-coating material on removable forms to prevent absorption of moisture and to prevent absorption of moisture and to prevent bond with shotcrete.

3.03 CONCRETE BATCHING AND MIXING

- A. Proportions: Mix proportions shall be controlled by weight batching. Contractor's Testing Laboratory shall maintain quality control records during shotcrete production and make those records available to Consultant.

3.04 CONCRETE PLACEMENT

- A. Placement: Use suitable delivery equipment and procedures that will result in shotcrete in place meeting the requirements of this Specification. Determine

operating procedures for placement in, extended distances, and around any obstructions where placement velocities and mix consistency must be adjusted.

- B. Placement Techniques: Do not place shotcrete if drying or stiffening of the mix takes place at any time prior to delivery to the nozzle.
1. Control thickness, method of support, air pressure, and/or water content of shotcrete to preclude sagging or sloughing off. Discontinue shotcreting or provide suitable means to screen the nozzle stream if wind or air currents cause separation of the nozzle stream during placement.
 2. Hold nozzle as perpendicular to surface as work will permit, to secure maximum compaction with minimum rebound.
 3. In shotcreting walls, begin application at bottom. Ensure work does not sag.
 4. Layering:
 - a. Build up layers by making several passes of nozzle over work area.
 - b. Broom or scarify the surface of freshly placed shotcrete to which, after hardening, additional layers of shotcrete are to be bonded. Dampen surface just prior to application of succeeding layers.
 - c. Allow each layer of shotcrete to take initial set before applying succeeding layers.
 - d. Use radial templates to insure exact radii from flat bottom of skate park to face of coping. Template shall be fabricated from steel or $\frac{3}{4}$ " Plywood. Check every horizontal foot when applying shotcrete for conformance of intended wall radii. Brace template and place levels at arc to tangent connections to insure no kinks will be formed. Kinks at the bottom of bowls will not be acceptable. Slumping of the shotcrete causing coping setback will not be acceptable.
 5. Placement Around Reinforcement:
 - a. Hold the nozzle at such distance and angle to place materials behind reinforcement before any material is allowed to accumulate on its face. In the dry-mix process, additional water may be added to the mix when encasing reinforcement to facilitate a smooth flow of material behind the bars.
 - b. Test to ascertain if any void or sand pockets have developed around or behind reinforcement by probing with an awl or other pointed tool after the shotcrete has achieved its initial set, by removal of randomly selected bars, or coring or other suitable standards.
- C. Access: Allow easy access to shotcrete surfaces for screening and finishing, to permit uninterrupted application.

3.05 REMOVAL OF SURFACE DEFECTS IN CONCRETE

- A. General: Remove and replace shotcrete which lacks uniformity, exhibits segregation honeycombing, or lamination, or which contains any dry patches, slugs, voids, or pockets. Remove defective areas.
- B. Sounding: Sound work with hammer for voids. Remove and replace damaged in-place shotcrete.

3.06 CONCRETE FINISH

- A. Finish-General: Smooth form finish shall consist of a smooth, hard, uniform texture with a minimum of seams.
- B. Radial Wall Finish: Float finish on radial face of wall shall consist of a smooth, hard, uniform surface of smooth steel trowel. Level to a tolerance of ¼" inch in 10 feet when tested with a 10-foot steel straightedge placed on the surface horizontally, and vertically with radial template with the appropriate radii. Grinding the surfaces will not be an acceptable means of achieving the intended radii. Concrete finish work shall match the approved sample poured on site.

3.07 CONCRETE JOINTS

- A. Cleaning: The entire joint shall be thoroughly cleaned and wetted prior to the application of additional shotcrete.
- B. Reinforcement: Make joints perpendicular to the main reinforcement. Continue reinforcement across joints.

3.08 CONCRETE CURING AND PROTECTION

- A. Curing Agent: Apply Clear spray-on cure agent after final finish is achieved. Submit proposed product to Owner's Representative for approval. Contractor to remove cure agent at end of cure period and power wash all walls prior to final acceptance.

3.09 CLEAN-UP

- A. At completion of Work, remove concrete stains from adjacent work, including but not limited to dissimilar paving types, walls, columns, railing posts, light fixtures, plant materials, to satisfaction of Consultant.
- B. Efflorescence: Remove efflorescence [as soon as practical after it appears] as part of final cleaning.
- C. Use least aggressive cleaning techniques possible.
- D. Wear protective eye wear, gloves, and clothing suitable to work and as required by cleaner manufacturer.
- E. If proprietary cleaning agents are used, pre-wet wall, test cleaning agent on a small, inconspicuous area, and check effects prior to proceeding. Begin cleaning at the top and work down. Thoroughly rinse wall afterwards with clean water. Follow cleaner manufacturer's instructions.
- F. Do not use muriatic (hydrochloric) acid on colored concrete.

END OF SECTION

**SECTION 03 3900
CONCRETE CURING**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SPECIALTY SKATE PARK CONSTRUCTION

- A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section and have been pre-qualified may perform this work as specified herein.

1.03 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all Concrete Curing related to the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. Related Work:
 - 6. Section 03 30 00 – Cast-In-Place Concrete
 - 7. Section 03 37 13 – Shotcrete

1.04 REFERENCES

- A. Comply with the applicable reference specifications as specified in the GENERAL PROVISIONS and in accordance with applicable laws, codes and regulations required by the Kitsap County. Comply with the current provisions of the following Codes and Standards:
- B. ASTM - American Society for Testing and Materials:
 - 1. ASTM C94 – Ready-Mixed Concrete.
 - 2. ASTM C150 – Portland Cement.
 - 3. ASTM C271 – Sheet Materials for Curing Concrete.
 - 4. ASTM C309 – Liquid Membrane-Forming Compounds for Curing Concrete.
 - 5. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.
- C. ACI – American Concrete Institute:
 - 1. ACI 301 – Specifications for Structural Concrete for Buildings.
 - 2. ACI 305 – Recommended Practice for Hot Weather Concreting.
 - 3. ACI 306 – Recommended Practice for Cold Weather Concreting.
 - 4. ACI 318 – Building Code Requirements for Reinforced Concrete.
- D. UBC – Uniform Building Code.

1.05 SUBMITTALS

- A. In accordance with Contract Documents, General, Special and Technical Provisions.
- B. Submit product data and manufacturer's instructions for:
 - 1. Curing compound.
 - 2. Proprietary cleaning agents.
 - 3. Plastic film for curing.
 - 4. Surface retarders.

1.06 QUALITY ASSURANCE

- A. Safety and Performance Guidelines: Comply with all safety and performance requirements and all applicable references as specified in the ASTM F2480 Standard Guide for In-ground Skate Parks.
- B. Contractor Experience: Provide evidence to indicate successful experience in providing cast-in-place concrete work for skate parks similar in scope to that specified herein and can demonstrate successful experience through past project documentation and references as required in 00 3000 Statement of Bidder Qualifications.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store materials in dry and protected locations and protect from damage.

1.08 SITE CONDITIONS

- A. Environmental Requirements: Protect concrete against extreme cold and heat, frost, rapid drying, and damage by rain.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Curing Compound: ASTM C 309, non-staining, all resin type, white-pigmented, compatible with color admixture.
- B. Acceptable Product: Burke Spartan-Cote Cure or equal. Curing Compound Application Rate: 350 sq. ft./U.S. Gallon (12.5m sq./L)

PART 3 - EXECUTION

3.01 CURING

- A. Protect concrete surfaces against rapid drying. Keep sealed with cure agent for necessary amount of time to reach concrete strength and inhibit moisture loss after placing per manufacturer's recommendation.

- B. Apply to exposed surface of concrete as soon as manufacturer recommends with an airless sprayer.
- C. Apply to sides of concrete paving upon removal of form boards.
- D. Meet requirements of manufacturer's current printed application instructions.
- E. Uniformly apply 2 coats and apply the second coat at right angle to first coat.
- F. Apply compound to form a continuous, uniform, coherent film that will not check, crack, or peel.
- G. Do not apply to concrete that is still bleeding, or has a visible water sheen on the surface.
- H. Protect paving surfaces from foot traffic with scuff-proof paper.
- I. Immediately re-coat damaged areas of curing compound.
- J. Protect surface from water, adjacent shotcrete work and debris.

3.02 CLEANUP

- A. Contractor to remove all cure agent from concrete surface with power washing equipment and soft brush not causing abrasion to finish work surface prior to final inspection. No Cure Agent shall be present on any surfaces for final inspection acceptance. Remove debris and trash resulting from specified work.

END OF SECTION

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.01 SPECIALTY SKATE PARK CONSTRUCTION

- A. All work contained in this Section is considered specialty skate park construction. Only those firms that meet the minimum experience requirements contained in the QUALITY ASSURANCE Section and have been pre-qualified may perform this work as specified herein.

1.03 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all Metal Fabrications for the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. Related Work:
 - 1. Section 03 10 00 – Concrete Formwork
 - 2. Section 03 20 00 – Concrete Reinforcement
 - 3. Section 03 30 00 – Cast-In-Place Concrete
 - 4. Section 03 37 13 – Shotcrete

1.04 REFERENCES

- A. Comply with the applicable reference specifications as specified in the General Conditions and in accordance with applicable laws, codes and regulations required by Kitsap County. Comply with the current provisions of the following Codes and Standards:
- B. ASTM - American Society for Testing and Materials:
 - 1. ASTM A36 – Structural Steel.
 - 2. ASTM A120 – Steel Pipe and Tubing.
 - 3. ASTM F2480 – Standard Guide for In-ground Concrete Skate Park.
- C. IBC – International Building Code
- D. AWS – American Welding Society
 - 1. AWS D1.1 – Structural Welding Code (latest edition)
- E. CRSI – Concrete Reinforcing Steel Institute: “Manual of Standard Practice,” latest edition.
- F. AISC – American Institute of Steel Construction, Inc: “Specifications of Architecturally Exposed Structural Steel,” latest edition.

1.05 QUALITY ASSURANCE

- A. Qualifications of Fabricators: Experienced in fabrication of miscellaneous metals.
- B. Qualifications of Welders: Welding shall be done only by certified welding operators currently qualified according to AWS D1.1.
- C. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the Work, and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section. Welds indicated may be made in shop or field with approval.

1.06 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit shop drawings for all custom fabricated items under this section. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories. Indicate welded connections using standard AWS welding symbols.
 - 2. Verification: Verify all measurements at the job. Show dimensions, sizes, thicknesses, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from drawings.
- B. Samples: Required for all Coping and Edging of concrete work. Submit finish metal samples for final finish selection. Submit prior to delivery to site. Attach name, address of manufacturer and/or supplier to each sample.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Storage of Materials: Materials which are stored at the project site shall be above ground on platforms, skids, or other supports. Protect steel from corrosion. Store other materials in a weather-tight and dry place until ready for use.
- B. Protection:
 - 1. Use all means necessary to protect miscellaneous metals before, during and after installation and to protect the installed work and materials of all other trades.
 - 2. Protect any adjacent materials or areas below from damage due to weld splatter or sparks during field welding.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

1.08 JOB CONDITIONS

- A. Examine existing conditions in which the work is to be installed. Notify Consultant if conditions are unacceptable to begin work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

1.09 COORDINATION

- A. Templates and Built-ins: Furnish all anchors, fastenings, sleeves, setting templates and layouts affecting or installed in the work of other trades.
- B. Delivery: Where items must be incorporated or built into adjacent work, deliver to trade responsible for such work in sufficient time that progress of work is not delayed. Be responsible for proper location of such items.
- C. Coordination: Coordinate with work of Cast-In-Place Concrete Section 03310.

1.10 JOB SITE SAMPLE

- A. Contractor to provide fabricated, onsite sample of metal item(s), complete with approved finish, for review by Owner and Consultant before fabrication of total quantities. Any fabrication of project item(s) by Contractor before Owner review and approval is subject to rejection.
- B. Approved sample(s) shall be used as the standard of workmanship and shall remain on site until work has been completed and approved by the Consultant.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. 2" ROUND STEEL PIPE COPING: HSS 2.375 X 0.154, ASTM A-500 GRADE B, (FY=46 KSI).
- B. 2-1/2" ROUND STEEL PIPE COPING: HSS 2.875 X 0.203, ASTM A-500 GRADE B, (FY=46 KSI).
- C. 3" ROUND STEEL PIPE COPING: HSS 3.500 X 0.216, ASTM A-500 GRADE B, (FY=46 KSI).
- D. 3-1/2" ROUND STEEL PIPE COPING: HSS 4.000 X 0.226, ASTM A-500 GRADE B, (FY=46 KSI).
- E. 2" X 2" SQUARE STEEL TUBING: HSS 2.000 X 2.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- F. 3" X 3" SQUARE STEEL TUBING: HSS 3.000 X 3.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- G. 4" X 4" SQUARE STEEL TUBING: HSS 4.000 X 4.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).

- H. 2" X 3" RECTANGULAR STEEL TUBING: HSS 2.000 X 3.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- I. 2" X 6" RECTANGULAR STEEL TUBING: HSS 2.000 X 6.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- J. 2" X 8" RECTANGULAR STEEL TUBING: HSS 2.000 X 8.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- K. 2-1/2" X 4" RECTANGULAR STEEL TUBING: HSS 2.500 X 4.000 X 0.1875, ASTM A-500 GRADE B, (FY=46 KSI).
- L. WELDING RODS: E-70 series low hydrogen unless otherwise noted on drawings.

2.02 GROUT

- A. Non-shrinking Master Builder's "Embedco", Conrad Sovig's "Metel-Mxs Grout", Sonneborn's "Ferrolith G Redi-Mixed Grout" or approved equal.

2.03 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of miscellaneous metals, shall be new, first quality of their respective kinds and subject to the approval of the Consultant.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

- A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Discrepancies: In the event of discrepancy, immediately notify the Consultant

3.02 COORDINATION

- A. General: Carefully coordinate with all other trades to insure proper and adequate interface of the work of other trades with the Work of this Section.
- B. Delivery: Insure timely delivery of all metal fabrications which must be installed in other work so as not to delay that work.

3.03 INSTALLATION

- A. General:
 - 1. Install metal fabrications in strict accordance with the Drawings, the approved Shop Drawings, and all applicable codes, regulations and standards.
 - 2. Obtain Owner's Representative review prior to site cutting or making adjustments which are not parts of the scheduled work.
 - 3. Install items square and level, accurately fitted and free from distortion or defects.

4. Align all metal fabrications as shown on the Drawings, and where vertical or horizontal members are shown. Align them straight, plumb and level within tolerance.
5. Make provisions for erection stresses by temporary bracing. Keep work in alignment.
6. Replace items damaged in course of installation.
7. Perform field welding in accordance with AWS D1.1
8. After installation, grind smooth and touch-up field welds.

3.04 WORKMANSHIP

- A. Layout: Set all work plumb, true, rigid, and neatly trimmed out. Miter corners and angles of exposed molding and frames unless otherwise noted.
- B. Fitting: Fit exposed connections accurately together to form tight hairline joints.
- C. Labor: Employ only workmen specifically skilled in such work.

3.05 FABRICATION

- A. Shop assemble in largest practicable dimensions, making members true to length so assembling may be done without fillers.
- B. Provide all surfaces free of file marks, dents, hammer marks, wire edges or any unsightly surface defects.
- C. STEEL PIPE COPING: Roll pipe to conform with top radius curve of each bowl and ledge as shown on drawings. Refer to drawings for relational tolerance to concrete surface and other steel.

3.06 ATTACHMENTS AND REINFORCEMENTS

- A. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for site metalwork or for attachment of adjacent work. If applicable, drill or punch holes; do not use cutting torch.

3.07 OTHER CONNECTIONS

- A. Make all permanent connections in ferrous metal surfaces using welds where at all possible; do not use bolts or screws.

3.08 WELDING

- A. Preparation: Remove all rust, paint, scale and other foreign matter. Wire brush all flame-cut edges. Clamp members as required and alternate welds, all as necessary to prevent warping or misalignment.
- B. Exposed Welds: Uniformly grind smooth (no tolerance) all welds normally exposed to view and feel in the finished work.

- C. Faulty and Defective Welding: Chip out and replace all welding showing cracks, slag inclusion, lack of fusion, bad undercut or other defects ascertained by visual or other means of inspection. Replace and re-weld at no cost to Owner.
- D. Field Welding:
 - 1. Procedure: Comply with AWS code of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
 - 2. Protection: Protect all adjacent surfaces from damage due to weld sparks, spatter, or tramp metal.

3.09 SURFACE TREATMENT AND PROTECTIVE COATINGS

- A. Cleaning:
 - 1. Thoroughly clean all mill scale, rust, dirt, grease and other foreign matter from ferrous metal prior to any galvanizing, or painting.
 - 2. Conditions which are too severe to be removed by hand cleaning, shall be cleaned using appropriate methods for solvent cleaning, power tool cleaning and brush-off blast cleaning.
- B. Exterior Ferrous Metal:
 - 1. Grind smooth all welds, burrs, and rough surfaces. Clean all coping from grease.
 - 2. Shop coat iron metal items; using anti-rust primer (red color).
 - 3. All welds to be painted with primer after appropriate connections and grinding has taken place. Touch-up all scratched primer prior to shotcrete application.

3.10 CLEAN-UP

- A. Keep all areas of work clean, neat and orderly at all times. Keep paved areas clean during installation.
- B. Clean up and remove all debris from the entire work area prior to Final Acceptance to satisfaction of Consultant.

END OF SECTION

SECTION 09 9000 PAINTING

PART 1 – GENERAL

1.01 GENERAL CONDITIONS

- A. Requirements of the Contract Documents, including but not limited to, the General, Special, and Technical Provisions, apply to work in this Section with the same force and effect as though repeated in full herein.

1.02 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to install all Painting for the skate park as indicated on the Drawings complete as shown and as specified herein.
- B. This Section includes surface preparation and field painting of the following:
 - 1. Miscellaneous exposed exterior items and surfaces.
- C. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Consultant will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Finished metal surfaces include the following if used:
 - a. Stainless steel.
 - b. Bronze and brass.
 - c. Iron
 - 2. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- E. Related Work:
 - 1. Section 05 50 00 – Metal Fabrications (Skate Park)
 - 2. Section 05 70 00 – Ornamental Metals (Skate Park)

1.03 REFERENCES

- A. Comply with the applicable reference specifications as specified in the General Conditions and in accordance with applicable laws, codes and regulations required by the Kitsap County. Comply with the current provisions of the following Codes and Standards:
- B. ASTM - American Society for Testing and Materials

- C. IBC – International Building Code
- D. SSPC – Society for Protective Coatings: “Steel Structures Painting Manual,” latest edition.

1.04 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
 - 3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
 - 4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
 - 5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

1.05 SUBMITTALS

- A. Product Data: For each paint system specified. Include block fillers and primers.
 - 1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
 - 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated. Consultant will pick an earthtone – or Black paint from the supplied color chart or paint chip (by contractor).
- C. Samples for Verification: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
 - 3. Submit Samples on the following substrates for the Owner Representative's review of color and texture only:
 - a. Ferrous Metal: Provide two 4-inch- (100-mm-) square samples of flat metal and two 8-inch- (200-mm-) long samples of solid metal for each color and finish.
- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects

with project names and addresses, names and addresses of Consultants and owners, and other information specified.

1.06 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.08 PROJECT CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F (10 and 32 deg C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F (7.2 and 35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.09 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.
 - 1. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.

2.02 MATERIALS

- A. Material Compatibility: Provide fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide color selections made by the Consultant.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Consultant about anticipated problems using the materials specified over substrates primed by others.

3.02 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - 3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
 - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

- D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.

3.03 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, covers, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
 - 5. Sand lightly between each succeeding enamel or varnish coat.

- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 2. Omit primer on metal surfaces that have been shop primed and touchup painted.
 - 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
 - 1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
 - 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 - 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- E. Fillers: Apply fillers at a rate to ensure complete coverage of pores filled.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.
- G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.04 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.05 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Consultant
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.06 EXTERIOR PAINT SCHEDULE

- A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
 1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a rust-inhibitive primer.
 2. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).
 - a. Devoe: 13101 Mirrolac Rust Penetrating Metal Primer.
 - b. Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
 - c. Glidden: 5205 Glid-Guard Tank & Structural Primer, Red.
 - d. Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - e. PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
 - f. P & L: S/D 1009 Suprime "9" Interior/Exterior Alkyd Metal Primer.
- B. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
 1. Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
 2. Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
 3. Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
 4. Moore: MoorGlo Latex House & Trim Paint #096.
 5. PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
 6. P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

END OF SECTION

**SECTION 12 9300
SITE FURNISHINGS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Traffic bollard
 - 2. Wood bollard
- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for installation of pipe sleeves cast installation of anchor bolts cast in concrete footings.
 - 2. Division 31 Section "Earthwork" for excavation for installation of concrete footings.
- C. Products furnished, but not installed under this Section, include pipe sleeves and anchor bolts to be cast in concrete footings.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For units with factory-applied color finishes.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Size: Not less than 6-inch long linear components and 4-inch square sheet components.
- D. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
- E. Maintenance Data: For site furnishings to include in maintenance manuals.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; free of surface blemishes and complying with the following:

1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
 2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 3. Structural Pipe and Tube: ASTM B 429.
 4. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 5. Castings: ASTM B 26/B 26M.
- B. Steel and Iron: Free of surface blemishes and complying with the following:
1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
 2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53, or electric-resistance-welded pipe complying with ASTM A 135.
 3. Tubing: Cold-formed steel tubing complying with ASTM A 500.
 4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500; zinc coated internally and externally.
 5. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
 6. Perforated Metal: From steel sheet not less than 0.1196-inch nominal thickness; manufacturer's standard perforation pattern.
 7. Gray-Iron Castings: ASTM A 48/A 48M, Class 200.
- C. Stainless Steel: Free of surface blemishes and complying with the following:
1. Sheet, Strip, Plate, and Flat Bars: ASTM A 666.
 2. Pipe: Schedule 40 steel pipe complying with ASTM A 312/A 312M.
 3. Tubing: ASTM A 554.
- D. Wood: Surfaced smooth on four sides with eased edges; kiln dried, free of knots, solid stock of species indicated.
1. Wood Species:
 - a. Cedar: Clear all heart #1 Premium Grade, S4S – E4E.
 - b. Finish: transparent wood preservative treatment and sealer
- E. Anchors, Fasteners, Fittings, and Hardware: commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.
1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on-grade substrate; extent as indicated.
 2. Antitheft Hold-Down Brackets: For securing site furnishings to substrate extent as indicated on Drawings.
- F. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.
- G. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.
- H. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:

1. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.

2.02 REMOVABLE BOLLAR

- A. Products: Subject to compliance with requirements, provide the following:
 1. Patterson-Williams Model 1100; in-ground installation and in-ground sleeve installation.
- B. Bollard Construction:
 1. Pipe OD: Not less than 4-1/2 inches.
 2. Round steel, 4-1/2" inches in diameter
 3. Overall Height: 36"
 4. Overall Width: 9-1/4" at base.
 5. Overall Depth: 33"
 6. Options: Locking Option for in-ground sleeve
 7. Installation Method: Per Manufacturer's Instructions.
- C. Steel Finish: Powder Coat
 1. Color: Hunter Green to match existing on-site bollards.

2.03 WOOD BOLLARD

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Timber Form: Timber Bollard; 2526 or comparable product.
- B. Bollard Construction:
 1. Square Wood: Cedar, 12 inches in diameter.
 2. Style: Chamfered top.
 3. Overall Height: 36 inches.
 4. Overall Width: 12 inches.
 5. Overall Depth: 12 inches.
 6. Accessories: None.
 7. Installation Method: Cast in concrete.
- C. Wood Finish: All wood components shall be pressure-preservatively treated with a non-toxic formulation. The preservative solution shall be homogeneous and capable of deep penetration, not merely an emulsion. The treatment shall not materially change the color of the wood to which it is applied.
Preservatives containing arsenic, pentachlorophenol, creosote or similar toxic chemicals as their active ingredient shall not be used.

2.04 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWWA M4 to cut surfaces.

- E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- F. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.05 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.06 ALUMINUM FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.07 STEEL AND GALVANIZED STEEL FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.08 IRON FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.09 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.
- D. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with **[nonshrink, nonmetallic grout] [or] [anchoring cement]**, mixed and placed to comply with

anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

3.03 CLEANING

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION

SECTION 31 1000

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- B. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.
- C. Stormwater Pollution Prevention Plan, prepared by BCRA (Appendix B).

1.02 SECTION INCLUDES

- A. Tree and shrub removal.
- B. Stripping and removal of topsoil, sod, debris and organic-bearing topsoil.
- C. Removal of existing asphalt pavement, curbs and miscellaneous concrete elements.

1.03 PROJECT CONDITIONS

- A. Contractor is responsible for visiting the site prior to bid to understand the site conditions and scope of clearing work required to accommodate the work of this project.
- B. Refer to Appendix A – Geotechnical Engineering Investigation by Krazan & Associates, Inc. dated August 17, 2010 for information on existing site conditions. Report is included for reference only related to existing site and soil conditions, specific requirements related to the site and soils requirements for this project are shown on the Drawings and included in the Project Manual.
- C. Conform to applicable regulations relating to environmental requirements and disposal of debris.
- D. On-site burning of site clearing debris is not allowed.
- E. Existing site subgrade soils may be moisture sensitive. Operating equipment on subgrade that has moisture content over optimum for achieving specified compaction could result in a soft, mushy subgrade that will require drying out and recompaction or excavation and removal from the site at Contractor's expense. It shall be the contractor's responsibility to schedule work to be accomplished when weather and site conditions are dry and take any measures necessary to protect site soils from becoming unusable or over optimum moisture content or import suitable materials.
- F. Control the flow, collection, channeling and discharge of water on site to prevent damage to subsoil and excavations, to prevent off-site damage of any type and to conform to all ordinances and laws. Do not allow water to stand in any area where pavement is to be constructed.
- G. Protect above and below-grade utilities, refer to Section 02 1725 for requirements related to existing utilities.

- H. Tree and Shrub Protection: Protect existing trees and shrubs not scheduled for removal from damage during clearing and grubbing work.
- I. Existing Improvements: Provide protection necessary to prevent damage to existing improvements not indicated for removal. Restore damaged improvements to their original condition at the Contractor's expense.
- J. Protect bench marks, survey control points, existing structures, sidewalks, paving and curbs from excavating equipment and vehicular traffic.
- K. Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.

1.04 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
 - 3. It is not the intent of the Construction Documents to dictate any unsafe construction means or methods; determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall work of this project in a coordinated and efficient manner.

3.02 PROTECTION PRIOR TO SITE CLEARING

- A. Do not start any clearing work until erosion and sediment control provision specified in Section 31 2500, in the Stormwater Pollution Prevention Plan Report and shown on Drawings, have been completed.
 - 1. Monitor water runoff from the site continuously during clearing work and implement any temporary erosion and sediment control measures on-site to mitigate / prevent turbid water runoff from leaving the site in conformance with State and local regulations.
- B. Locate, identify and protect existing underground and overhead utilities from damage,

refer to Section 02 1725 for requirements regarding existing utilities. Pothole utilities to verify location. Existing utilities shall be located and marked in the field before the Contractor begins excavating.

- C. Tree and Shrub Protection: Prior to start of any work flag each existing tree and shrub in the vicinity of the clearing area that is not scheduled for removal and install 6" wide yellow construction ribbon around each tree / shrub.
- D. Protect benchmarks, survey control joints and existing structures from damage or displacement. Said benchmark or control points shall be restored by a Professional Land Surveyor licensed to practice in the State of Washington, in accordance with standard of professional practice and State regulations.

3.03 PREPARATION

- A. Lay out the construction limits accurately on the site and mark clearly for maximum visibility by equipment operators during clearing operations.

3.04 CLEARING AND GRUBBING

- A. Remove trees, stumps and shrubs within clearing limits. Remove main root balls, tap roots and root systems, including those that extend deeper than topsoil stripping depths.
- B. Clear all vegetation and deadwood, including roots within the clearing limits.
- C. Where existing trees are indicated to remain, stop topsoil stripping a sufficient distance away to prevent damage to the root system, typically this requires that stripping efforts stop at the tree drip line.
- D. Dispose of removed materials offsite at a Contractor provided and permitted disposal site.
- E. Open burning of waste material is not allowed.
- F. Asphalt / concrete pavement within the clearing limits, as indicated on the drawings, shall be removed down to subgrade.

3.05 STRIPPING AND REMOVAL

- A. Strip off and remove all sod and organic topsoil to construction limits exposing undisturbed native subgrade soil that is free of any organic material including roots; dispose of offsite at a Contractor provided and permitted disposal site or else stockpile and protect on-site for re-use with final landscaping.
 - 1. Remove localized areas of topsoil that are greater in depth than noted above as required to fully remove surface vegetation, organic material, roots and organic soils.
- B. Remove exposed boulders and any building debris encountered from site.

3.06 REVIEW OF SUBGRADE BY GEOTECHNICAL ENGINEER

- A. Schedule Geotechnical Engineer to inspect the exposed subgrade soils after stripping and removal has been completed but prior to any earthwork being started. Give Engineer at least 3 days advance notice for each site visit.
 - 1. Geotechnical Engineer shall inspect subgrade soils and determine if they are free of organic material and suitable for earthwork to proceed.
 - 2. If Geotechnical Engineer determines that any subgrade soils still contain organic material or are otherwise unsuitable, strip off and remove the unsuitable soils as required by Geotechnical Engineer at the Contractor's expense.

3.07 PROTECTION AFTER SITE CLEARING

- A. Protecting Subgrade:
 - 1. Protect newly exposed subgrade from damage due to water, traffic, freezing and erosion. Plan work so that subgrade is not left open and exposed to wet weather and construction traffic.
 - 2. Contractor is responsible for planning and overseeing the work so that exposed subgrade is protected from becoming soft, yielding or unsuitable after being exposed, requiring over-excavation and structural fill.
- B. Utilities: Refer to Section 02 1725 for requirements related to existing utilities. The Contractor shall protect private and public utilities from damage. Adequate provisions shall be made for maintaining all electrical and other underground facilities encountered during construction. Structures which have been disturbed or damaged by the Contractor shall be satisfactorily restored, unless shown for demolition, upon completion of the work.
- C. Pavement: The Contractor shall protect from damage all street pavement or paved areas on streets leading to site.
- D. Access Streets and Roadways: Provide wheel cleaning stations to clean wheels and undercarriage of trucks before leaving site, as necessary, to prevent dirt from being carried onto public streets. If streets are fouled, they must be cleaned immediately in conformance with Kitsap County, Washington State Department of Ecology, and all governing requirements and regulations.
- E. Repair and / or replacement of damaged facilities shall be accomplished at the Contractor's expense.

3.08 CLEAN-UP

- A. Remove any dirt and debris from streets and pavements, dry sweep affected areas clean.
- B. Clean out and remove any dirt, silt or debris that is carried offsite or into any storm drainage system by water runoff resulting from clearing work on this site.
- C. Shape earthwork to blend naturally into surroundings.

END OF SECTION

SECTION 31 2000

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- D. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Earthwork (excavation, fill, compaction, grading, hauling, etc.) required for the construction of the Work.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- D. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- F. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- G. ASTM D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
- H. WSDOT Specification: Standard Specification for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition. (Delete Measurement and Payment Provisions.)
- I. WSDOT Standard Plans for Road and Bridge and Municipal Construction: Standard plans prepared by the Washington State Department of Transportation, latest revision issued prior to bid date.
- J. International Building Code, Chapter 17 and Chapter 18

1.04 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.

- B. Samples: Coordinate testing agency sampling of representative imported structural fill, native structural fill and wet weather structural fill for lab analysis of fill material per ASTM D1557.

1.05 DEFINITIONS

- A. Satisfactory Soils: Soils free of organic or other deleterious materials, with moisture content at or near optimum that can be compacted to the specified density.
- B. Unsatisfactory Soils: Soils that contain organic or other deleterious materials or with moisture content above or below optimum that prevents compaction to the specified density.
- C. Utilities include on-site underground pipes, conduits, ducts and cables, as well as underground services within buildings.

1.06 PROJECT CONDITIONS

- C. Refer to Appendix A – Geotechnical Engineering Investigation by Krazan & Associates, Inc. dated August 17, 2010 for information on existing site conditions. Report is included for reference only related to existing site and soil conditions, specific requirements related to the site and soils requirements for this project are shown on the Drawings and included in the Project Manual.
- D. Contractor shall employ the materials, equipment, procedures and management expertise necessary to accomplish earthwork during wet weather while conforming to the requirements of the Contract Documents.
- E. Existing site subgrade soils may be moisture sensitive and may not be able to be compacted to the specified density when moisture content is over optimum. Operating equipment on subgrade that has a moisture content over optimum for achieving specified compaction will result in a soft, mushy subgrade that will require drying out and recompaction or excavation and removal from the site and replacing and compacting with new satisfactory soils at Contractor's expense. It shall be the contractor's responsibility to schedule work to be accomplished when weather and site conditions are dry and take any measures necessary to protect site soils from becoming unusable or over optimum moisture content or import satisfactory materials.
- F. Some groundwater seepage out of cuts and in excavations may be encountered on this site depending on time of year and weather. Provide sump holes, drainage trenches and pumps to collect, channel and remove this seepage water from the work areas and keep excavations free from standing water.
- G. Provide sump holes, drainage trenches and pumps to collect, channel and remove any water from the work areas and keep excavations free from standing water.
- H. Control the flow, collection, channeling and discharge of water on site to prevent damage to subsoil and excavations, to prevent off-site damage of any type and to conform to all ordinances and laws. Do not allow water to stand in any area where the pavement is to be constructed. Roller seal all surfaces at end of each work day to

reduce the potential for moisture infiltration into the subgrade soil.

- I. Existing Improvements: Provide protection necessary to prevent damage to existing improvements not indicated for removal. i.e. Bench marks, survey control points, existing offsite structures, sidewalks, paving and curbs. Restore damaged improvements to their original condition at the Contractor's expense.
- J. Traffic: Conduct earthwork operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
- K. Existing Utilities: Locate, mark and protect existing utilities as specified in Section 02 1725 prior to start of work.
- L. Schedule shutdown of existing utilities affected by work of this section with appropriate utility company and Owner as specified in Section 02 1725 prior to start of work.

1.07 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Contractor shall determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
 - 3. It is not the intent of the Construction Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide imported soil materials when satisfactory existing site soil materials are not available from excavations.
- B. Structural Fill: The Contractor shall provide any of the following materials subject to soil moisture content and weather conditions allowing compaction to the specified density. If wet condition construction is encountered use wet weather structural fill.
 - 1. Imported Structural Fill: Clean, well-graded sandy gravel, gravelly sand, or other approved naturally occurring granular material (pit run) with at least 30 percent retained on the No. 4 sieve, or a well-graded crushed rock. For dry weather construction may contain on the order of 10% fines (that portion passing the U.S. No. 200 sieve) based on the portion passing the U.S. No. 4 sieve. Fill material conforming to WSDOT Specification 9-03.14(1) is satisfactory for use as structural fill. Material at time of importing shall have a moisture content at or near enough to optimum to allow compaction to specified density, and shall be maintained at this level until compacted in place.

2. Existing Site Soils may not be used in structural fill applications in this project.
3. Wet Weather Select Granular Fill: If wet weather construction is anticipated or encountered, use imported select structural fill consisting of clean, free-draining, well-graded sand and gravel or crushed rock with less than 5% fines by weight based on the minus No. 200 sieve fraction. Fill shall be free of organic matter, debris or other deleterious material. Fill material conforming to WSDOT 9-03.12(2) provided that 30% is retained in the U.S. No. 4 sieve is satisfactory for use during wet weather.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall work of this project in a coordinated and efficient manner.
- B. Coordinate earthwork operations with construction of underground utilities to prevent damage to work and out of sequence construction.

3.02 HORIZONTAL AND VERTICAL CONTROL

- A. Employ a Land Surveyor registered in the State of Washington to lay out and stake the Work and provide horizontal and vertical control; refer to Section 01 7000 for additional requirements.
 1. Locate and protect survey control and reference points.
 2. Provide field engineering services. Establish elevations, lines and levels, utilizing recognized engineering survey practices.
- B. Lay out and stake the work area prior to starting earthwork.

3.03 PREPARATION

- A. Locate and mark existing utilities as required in Section 02 1725.
- B. Schedule shutdown of existing utilities affected by earthwork operations as specified in Section 02 1725.
- C. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by earthwork operations.
- D. Confirm that erosion-control measures are in place to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.04 DEWATERING

- A. Prevent surface water from entering excavations; prevent water from ponding on prepared subgrades and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.05 EXCAVATION

- A. Excavate to elevations and dimensions required to accommodate the work.
- B. Excavation for Site Pavements:
 1. Excavate pavement subgrade to firm and unyielding native soil.
 2. Utilize a smooth-edge bucket for footing excavation to limit disturbance to subgrade bearing surface.
- C. Excavate and remove any boulders or debris uncovered (partially or completely) during excavation and remove from the site, backfill any resulting voids in subgrade with structural fill compacted to specified density.
- D. Excavation near foundations for any purpose shall not remove lateral supports without first underpinning or protecting the foundation against settlement or lateral translation.
- E. Compact any subgrade excavated to required grade to a uniformly firm and unyielding condition each day before leaving site.
 1. In wet weather or wet site conditions, do not excavate and expose final subgrade elevation if proper compaction of soil cannot be achieved due to over optimum moisture content soil conditions.
- F. Reconstruct subgrades disturbed / damaged by freezing temperatures, frost, rain, accumulated water or construction activities at the Contractor's expense, as required by Geotechnical Engineer.
- G. Provide a 12 inch thick "working mat" of structural fill be placed over prepared subgrades in areas subject to construction traffic. Provide a non-woven geotextile fabric (Mirafi 170N or performance equivalent), placed below the gravel "working mat" at the direction of the Geotechnical Engineer. Construction traffic should be limited to working mat areas only. High traffic and high load areas, such as at site entrances and exits, may require additional protections.

3.06 PROOF ROLLING AND SUBGRADE APPROVAL

- A. General: Geotechnical Engineer shall inspect the excavated subgrade in existing undisturbed soil beneath pavements, and in any trench that exhibits soft or pumping subgrade.
- B. Excavated Subgrade Areas (Undisturbed Existing Subgrade): Proof roll existing soil subgrade under pavements as follows:

1. Schedule Geotechnical Engineer to inspect subgrade after cuts have been made but prior to any fill being placed. Give Engineer at least 3 days advance notice for each site visit, do not schedule when weather or site conditions are wet.
 2. Under the direction of the Geotechnical Engineer, proof roll the subgrade with heavily loaded rubber-tired equipment or large steel drum vibratory compaction equipment. Do not proof roll any wet or saturated subgrades except as specifically directed by Geotechnical Engineer. Extend proof rolling at least 10 feet beyond designated area as practical.
 3. If Geotechnical Engineer determines that unsatisfactory soil is present, excavate unsatisfactory soils and replace with structural fill material compacted to specified density at the Contractor's expense.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water or construction activities at the Contractor's expense, as directed by Geotechnical Engineer.

3.07 STORAGE OF STOCKPILED MATERIALS

- A. Stockpile imported materials and excavated native soil materials separately without intermixing. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion.
1. Temporary Stockpiles: Cover with waterproof sheeting when required to prevent moisture sensitive soil from becoming too wet to achieve specified compaction. Secure sheeting with stakes and sandbags.
 2. Stockpile soil materials well away from edges of excavations or the crest of any slopes.
 3. Stockpiles shall not be placed in a manner that would create sediment-laden runoff discharging to the public storm system.

3.08 FILL

- A. Preparation: Subgrade surface over which fill will be placed shall be free of any organic matter, vegetation, topsoil, debris, unsatisfactory soil materials, uncompactable soil and deleterious materials from ground surface before placing fills.
1. Bench sloped subgrade surfaces that are steeper than 1 vertical to 5 horizontal into level, benched steps with keyways so fill material will bond with existing material. Cut benches between 6 and 10 feet wide and not exceeding 3 feet in height.
 2. Prior to placement of any structural fill, the exposed subgrade should be recompact to a firm and unyielding condition with a large "sheep's foot" vibratory drum roller.
 3. Subgrade Approval: Do not place fill until Geotechnical Engineer has inspected and approved the subgrade.
- B. Placement And Compaction: Place fill material in uniform thickness loose fill layers; limit fill layer thickness to no more than the compaction equipment being utilized is capable of compacting to the specified density through the full depth of layer, but in no case shall fill layer exceed a maximum thickness of 8 to 10 inches for structural fill in loose thickness.
1. Compact fill layers uniformly over the entire fill area to specified density.

2. Continuously monitor compaction effort to assure that specified density is being achieved over entire area of fill.
 3. Adjust fill layer thickness as required to achieve specified compacted density through the full depth of layer.
 4. Coordinate compaction monitoring with testing lab compaction test results.
 5. Take special precautions around site structures to assure that compaction of fill is achieved, adjust the type of compaction equipment and change type of fill being placed to avoid areas that do not achieve the specified density or result in settlement.
 6. If wet weather or site conditions are anticipated or encountered, utilize fill materials and means and methods that will permit placement and compaction of fill material to specified density.
- C. **Compaction At Fill Slopes:** Construct slope face by careful compaction of the fill materials out to and beyond the final design slope face. Grade slope face to required contours after compaction is achieved.
- D. **Moisture Content:** Uniformly moisten or aerate fill soil before compaction to the optimum moisture content to achieve specified density.
1. **Fill Material With Over Optimum Moisture Content:** If specified density cannot be achieved because fill material is over optimum moisture content, select either of the following options:
 - a. Remove over optimum fill from the site and replace with fill with moisture content at optimum.
 - b. If weather and project schedule permits, dry out fill as required to achieve specified compaction by spreading out, etc.
 2. **Fill Material With Under Optimum Moisture Content:** Remove from site and replace, or provide water and equipment necessary to increase moisture content of fill uniformly so as to achieve specified density.
- E. **Protection:** Protect fill soils, both before and after placement, from becoming satisfactory for use by being left exposed to wet weather before placement, or from construction traffic, water damage or erosion after placement.
1. Grade surface to drain and roller-seal fill with steel drum roller compactor to avoid ponding water.
 2. If wet weather or site conditions are anticipated or encountered, place crushed surfacing working pad over any fill soils where construction traffic will disturb or soften soil as soon as possible after fill is completed.
 3. Backslope grade or construct diversion ditch or berm at top of slopes to prevent surface water from running down face of slope.
 4. Cover slopes with waterproof sheeting to protect from erosion, secure sheeting with stakes and sand bags.
- F. **Reconstruct in place fill soil disturbed / damaged by freezing temperatures, frost, rain, accumulated water or construction activities at the Contractor's expense, as required by Geotechnical Engineer.**

3.09 FILL PROOF-ROLLING AND GEOTECHNICAL REVIEW

- A. **Fill Areas Under Site Pavement:** After fill has been placed and compacted to specified density over site / area and after any trenching and backfill has been completed, but immediately prior to placement of any structural elements, reinforcing steel or

pavement base course, the exposed compacted fill soils shall be inspected by the Geotechnical Engineer for satisfaction and identification of any area where fill soils are soft or yielding.

1. Proof-rolling and review by Geotechnical Engineer should occur immediately prior to construction of any structure element or placement of pavement / slab base course.
2. Do not proof-roll any compacted in place fill that is wet or over optimum moisture content for compaction unless required by the Geotechnical Engineer.
3. Schedule Geotechnical Engineer to inspect structural fill under pavements has been placed and compacted to specified density. Give Geotechnical Engineer at least 3 days advance notice for each site visit; do not schedule when weather or site conditions are wet.
4. All areas of the fill area shall be proof-rolled under the observation of the Geotechnical Engineer with heavily loaded rubber-tired equipment or large steel drum vibratory compaction equipment as determined most satisfactory by Geotechnical Engineer.
5. If Geotechnical Engineer determines that any area of the fill is not satisfactory or is soft and yielding, excavate unsatisfactory soils and replace with structural fill material compacted to specified density as required by Geotechnical Engineer at the Contractor's expense.

3.10 MOISTURE CONTROL OF FILL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to the optimum moisture content to achieve specified density.
 1. Provide equipment for applying water uniformly to the subgrade.
 2. Do not place backfill or fill material on surfaces that are muddy or frozen.
 3. Remove and replace, or scarify and air-dry otherwise satisfactory material that exceeds optimum moisture content and is too wet to compact to specified density.

3.11 COMPACTION

- A. Compact soil to the following percentage of maximum dry density as determined by the ASTM D1557 (Modified Proctor) test procedure:
 1. Within the Bearing Plane* Under Pavements: 95%
 - a. *The bearing plane is that area located directly beneath any structure or pavement, or within a 1H:1V slope away from the bottom outside edge of any foundation or pavement.
 2. Landscape Areas (outside of pavement bearing plane): 90%
- B. Reduce the thickness of lifts as required to accommodate the limitations of the compaction equipment being use to achieve specified density.
- C. Failure to Achieve Compaction Density: Contractor shall remove and replace any fill material that fails to meet the specified compaction density or that settles after project completion at their own expense.

3.12 GRADING

- A. General: Uniformly grade areas to a smooth surface free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, as determined by the Geotechnical Engineer, fill low spots and trim high spots to comply with required surface tolerances.
 - 3. Regrade and re-compact areas subjected to vehicular traffic.

- B. Grading Subgrade: Finish subgrades to required elevations.
 - 1. Slope subgrades around building perimeters away from buildings to facilitate water drainage and prevent ponding around buildings.
 - 2. Slope pavement subgrades to match slope and profile of finish pavement surface elevations to facilitate water drainage avoid trapping subsurface water.
 - 3. Subgrade surface shall be graded smooth and free of low spots or ridges that would stop the flow of water or result in ponding.

3.13 DUST CONTROL

- A. Control and prevent the production of airborne dust due to wind or construction equipment traffic at any time during construction by watering the work area and site, comply with all local and State air quality regulations.

- B. Do not permit conditions on the site that would allow airborne dust resulting from the work of this project to drift onto adjacent properties.

3.14 FIELD QUALITY CONTROL

- A. Contractor Quality Control: Employ / assign quality control personnel to monitor the work of this section for conformance to the requirements of this section and to good construction practices.
 - 1. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of this section.
 - 2. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve specified compacted density and other requirements of this section and not rely solely on test data from Testing Agency.

- B. Testing Agency: Contractor will engage a qualified testing agency and Geotechnical Engineer to perform periodic field quality-control testing and review of Contractor's work.
 - 1. Tests taken are spot checks only at a given location and shall not be interpreted as representing the quality or integrity of all of the earthwork performed.
 - 2. Test data and reviews shall not be construed as acceptance of the work by the testing agency nor shall it relieve the Contractor of his responsibility to replace non-conforming or failed work.

- C. Coordinate and schedule the work to accommodate inspections and testing as follows:
1. **Geotechnical Engineer** shall inspect and approve the following:
 - a. Exposed subgrade after sod, topsoil and organics have been stripped off but prior to any excavation or fill work being started.
 - b. Subgrade under pavement areas after it has been cut to required elevation but prior to any required fill or base course being placed or building elements being constructed.
 - c. Fill subgrade under pavement areas after it has been placed and compacted to specified density but prior to any base course being placed or building elements being constructed.
 - d. Subgrade soils in any utility trench or area of the site that exhibits soft or pumping subgrade, prior to any fill being placed.
 2. **Geotechnical Engineer** shall perform special inspections per IBC Chapter 17 for the following:
 - a. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.
 - b. Verify excavations are extended to proper depth and have reach proper material
 - c. Perform classification and testing of compacted fill materials.
 - d. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.
 - e. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.
 3. **Testing Agency** shall inspect and test the following:
 - a. Collect soil samples from each different type of existing soil and imported soil and perform Modified Proctor Compaction Test per ASTM D1557 on each sample to determine maximum dry density / weight of sample and optimum moisture content.
 - b. Excavated subgrade prior to placement of any fill.
 - c. Compaction test each fill layer.
 - d. Compacted subgrade in bottom of utility trench excavation.
 - e. Areas required by the Geotechnical Engineer or Architect.
- D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D1557, ASTM D2167, ASTM D2922 and ASTM D2937, as applicable. Tests will be performed at the following locations and minimum frequencies:
1. Fill Under Pavements And In Utility Trenches: At each compacted fill and backfill layer, at least one test for every 1,000 sq. ft. or less of fill, but in no case fewer than three tests.
- E. When testing agency reports that subgrade, fill or backfill has not achieved degree of compaction density specified, scarify and moisten or aerate, or remove and replace soil to depth and width determined by the Geotechnical Engineer; recompact or replace with compacted structural fill and retest a the Contractor's expense, as required to achieve specified compaction density.

3.15 PROTECTION

- A. Protecting Subgrade And Graded Areas:
1. Protect newly graded areas from damage due to traffic, freezing and erosion.

2. Protect newly exposed subgrade from damage due to water, traffic, freezing and erosion. Plan work so that subgrade is not left open and exposed to wet weather and construction traffic.
 3. Contractor is responsible for planning and overseeing the work so that exposed subgrade is protected from becoming soft, yielding or unsatisfactory after being exposed, requiring over-excavation and structural fill.
 4. Contractor is responsible for planning and overseeing the work so that excavated soil and stockpiles are protected from becoming wet and over optimum moisture content, requiring removal and replacement.
- B. Protect building and utility structures from damage or collapse due to operation of heavy compaction equipment in too close proximity. Use smaller lifts and hand operated compaction equipment around retaining walls and utility structures.
1. Do not backfill retaining walls supporting floor structure until floor structure and connections are completed per structural drawings, unless specifically approved by Structural Engineer.
- C. Protect below grade waterproofing from damage during earthwork operations.
- D. 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.
1. Scarify or remove and replace soil material to depth as required by Geotechnical Engineer; reshape and recompact at the Contractor's expense.
- E. Utilities: Refer to Section 02 1725 for requirements related to existing utilities. The Contractor shall protect private and public utilities from damage. Adequate provisions shall be made for maintaining all electrical and other underground facilities encountered during construction. Structures which have been disturbed or damaged by the Contractor shall be satisfactorily restored, unless shown for demolition, upon completion of the work. Contractor may abandon existing utilities in place provided that:
1. All existing utilities within and 15 feet beyond the proposed building pad and appurtenances are removed.
 2. Pipes serve no purpose for this project, have at least 3 feet of cover at proposed grade and do not conflict with new utilities.
 3. Existing utility to be abandoned is filled with sand, grouted and capped.
 4. Existing utility trenches are backfilled and compacted to 95% max dry density.
 5. Engineer provides prior approval.
- F. Existing Pavement: The Contractor shall protect from damage all existing pavement or paved areas scheduled to remain.
- G. Access Streets and Roadways: Provide wheel cleaning stations to clean wheels and undercarriage of trucks before leaving site, as necessary to prevent dirt from being carried onto public streets. If streets are fouled, they must be cleaned immediately in conformance with Kitsap County, Washington State Department of Ecology, and all governing requirements and regulations.
- H. Repair and / or replacement of damaged facilities shall be accomplished at the Contractor's expense.

3.16 CORRECTION OF SUBGRADE SETTLEMENT

- A. Where settlement of subgrade occurs at any time, remove and replace as follows:
1. Inform the Architect, Engineer and Geotechnical Engineer immediately of any settlement that appears on the site or in the building.
 2. Remove affected / failed pavements or building elements and underlying settled soil, as required by Geotechnical Engineer, until firm, dense and unyielding satisfactory soil is exposed, backfill with structural fill (or other material as required by Engineer) and compact to specified density, and reconstruct removed pavements or building elements to match original construction.
 3. Restore appearance, quality and condition of finished surfaces to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
 4. The cost for correction of settlement, including restoration of pavements or building elements, resulting from Contractor's failure to comply with the requirements of the Contract Documents or as required by Geotechnical Engineer shall be borne by the Contractor.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal of uncontaminated soils and waste: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 2333

UTILITY TRENCHING AND BACKFILL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- E. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Underground utility trenching and backfill

1.03 REFERENCES

- A. All references shall be the latest adopted edition.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- D. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- G. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- H. ASTM D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
- I. WSDOT Specification: Standard Specification for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition. (Delete Measurement and Payment Provisions.)
- J. WSDOT Standard Plans for Road and Bridge and Municipal Construction, prepared by the Washington State Department of Transportation, latest revision issued prior to bid date.

1.04 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.

- B. Samples: Coordinate Testing Agency sampling of representative imported structural fill, native fill and wet weather structural fill for lab analysis of fill material per ASTM D1557.

1.05 DEFINITIONS

- A. Suitable Soil: Soils free of organic or other deleterious materials, with moisture content at or near optimum that can be compacted to the specified density.
- B. Unsuitable Soils: Soils that contain organic or other deleterious materials or with moisture content above or below optimum that prevents compaction to the specified density.
- C. Utilities include on-site underground pipes, conduits, ducts and cables, as well as underground services within buildings.

1.06 PROJECT CONDITIONS

- M. Refer to Appendix A – Geotechnical Engineering Investigation by Krazan & Associates, Inc. dated August 17, 2010 for information on existing site conditions. Report is included for reference only related to existing site and soil conditions, specific requirements related to the site and soils requirements for this project are shown on the Drawings and included in the Project Manual.
- N. Existing site subgrade soils may be moisture sensitive and may not be able to be compacted to the specified density when moisture content is over optimum. Operating equipment on subgrade that has a moisture content over optimum for achieving specified compaction will result in a soft, mushy subgrade that will require drying out and recompaction or excavation and removal from the site and replacing and compacting with new suitable soils at Contractor's expense. It shall be the contractor's responsibility to schedule work to be accomplished when weather and site conditions are dry and take any measures necessary to protect site soils from becoming unusable or over optimum moisture content or import suitable materials.
- O. Some groundwater seepage out of cuts and in excavations may be encountered on this site depending on time of year and weather. Provide sump holes, drainage trenches and pumps to collect, channel and remove this seepage water from the work areas and keep excavations free from standing water.
- P. Provide sump holes, drainage trenches and pumps to collect, channel and remove water from the work areas and keep excavations free from standing water.
- Q. Control the flow, collection, channeling and discharge of water on site to prevent damage to subsoil and excavations, to prevent off-site damage of any type and to conform to all ordinances and laws. Do not allow water to stand in any area where the building or pavement is to be constructed.
- R. Existing improvements: Provide protection necessary to prevent damage to existing improvements not indicated for removal. i.e. Bench marks, survey control points, existing structures on adjacent property, sidewalks, paving and curbs. Restore damaged improvements to their original condition at the Contractor's expense.

- S. Traffic: Conduct operations to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
- T. Existing Utilities: Locate, mark and protect existing utilities as specified in Section 02 1725 prior to start of work.
- U. Schedule shutdown of existing utilities affected by work of this section with appropriate utility company and Owner as specified in Section 02 1725 prior to start of work.

1.07 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Contractor shall determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
 - 3. It is not the intent of the Construction Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 2 - PRODUCTS

2.02 BEDDING AND BACKFILL MATERIALS

- A. Pipe bedding and backfill for public utilities shall be per utility purveyor standards / specifications.
- B. Pipe Bedding: Conform to WSDOT Specifications Section 9-03.12(3) consisting of crushed, processed, or naturally occurring granular material, free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact and shall meet the following specifications for grading and quality:

<u>Sieve Size</u>	<u>Percent Passing (By Weight)</u>
1-1/2 inch square	100% passing
1 inch square.....	75-100% passing
5/8 inch square.....	50-100% passing
U.S. No. 4	20-80% passing
U.S. No. 40	3-24% passing
U.S. No. 200	10% maximum passing
Sand Equivalent	35 minimum

- C. Trench Backfill:
 - 1. For general trenching: Backfill material shall conform to WSDOT 9-03.12(3) and WSDOT 7-08.3; material shall be free of roots, debris, organic matter and other deleterious material.

2.03 ACCESSORIES

- A. Detectable Warning Tape: Conform to WSDOT Specification 9-15.18; tape shall consist of inert polyethylene plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil, with metallic foil core to provide the most positive detection and pipeline locators. The tape shall be color coded and shall be imprinted continuously over its entire length in permanent black ink. The message shall convey the type of line buried below and shall also have the word "Caution" prominently shown. The width of the tape shall be as recommended by the manufacturer for the depth of installation. Color coding of the tape shall be as follows:
 - 1. Water: Blue tape color.
 - 2. Sewer: Green tape color.
 - 3. Electrical: Red tape color.
 - 4. Gas-Oil: Yellow tape color.
 - 5. Telephone-CATV: Orange tape color.
- B. Tracing Wire: 12 gauge copper wire.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall work of this project in a coordinated and efficient manner.
- B. Review and coordinate horizontal and vertical layout of each utility to accommodate new and existing utilities, review conflicts with Architect / Engineer prior to start of trenching.
- C. Coordinate trenching operations with construction of other underground utilities and with buildings to prevent damage to work and out of sequence construction.

3.02 HORIZONTAL AND VERTICAL CONTROL

- A. Employ a Land Surveyor registered in the State of Washington to lay out and stake the Work and provide horizontal and vertical control; refer to Section 01 7000 for additional requirements.
 - 1. Locate and protect survey control and reference points.
 - 2. Provide field engineering services. Establish elevations, lines and levels, utilizing recognized engineering survey practices.
- B. Lay out and stake utility lines prior to starting and trenching.

3.03 PREPARATION

- A. Locate and mark existing utilities as required in Section 02 1725. Review and resolve any conflicts between utilities with Architect / Engineer prior to starting any trenching work.
- B. Schedule shutdown of existing utilities affected by trenching operations as specified

in Section 02 1725.

- C. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by trenching operations.
- D. Confirm that erosion-control measures are in place to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.04 DEWATERING

- A. Prevent surface water from entering trenches; prevent water from ponding on trench bottom subgrade and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from trenching. Do not allow water to accumulate in trench bottoms.
 - 2. Install a dewatering system as required to keep trench bottoms dry and to convey ground water away from trenches. Maintain until dewatering is no longer required.

3.05 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to required gradients, lines, depths and elevations in conformance with details shown on the Drawings.
- B. Excavate trenches to widths required to provide a working clearance on each side of pipe, conduit or utility.
- C. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
 - 1. Compact bottom of trench to a uniformly firm and unyielding condition prior to placing bedding or utility in trench.
 - 2. Fill over-excavated areas with trench backfill and compact to specified density.
 - 3. Over-excavate any soft or yielding areas in trench subgrade and replace with trench backfill compacted to specified density.
 - 4. In wet weather or wet site conditions, utilize means and methods that will avoid trench bottom subgrade being disturbed or over optimum moisture content making compaction to a firm and unyielding condition impossible.
- D. Excavate and remove any boulders or debris uncovered (partially or completely) during trenching and remove from the site, backfill any resulting voids in subgrade with trench backfill compacted to specified density.
- E. Protection of Excavated Material: When excavated soil is suitable structural fill and intended for use as backfill or structural fill, protect from becoming over optimum moisture content by covering and protecting from weather / water.
- F. Geotechnical Engineer shall inspect any trench that exhibits soft or yielding subgrade prior to placing bedding or utility in trench.
 - 1. Over-excavate unsuitable subgrade soils as required by Engineer and replace

with trench backfill compacted to specified density.

3.06 STORAGE OF STOCKPILED MATERIALS

- A. Stockpile imported materials and excavated native soil materials separately without intermixing. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion.
 - 1. Temporary Stockpiles: Cover with waterproof sheeting when required to prevent moisture sensitive soil from becoming too wet to achieve specified compaction. Secure sheeting with stakes and sandbags.
 - 2. Stockpile soil materials well away from edges of excavations or the crest of any slopes.
 - 3. Stockpiles shall not be placed on pervious pavement or in raingarden areas.
 - 4. Stockpile soil materials downstream of pervious pavement and raingarden areas.

3.07 BACKFILL

- A. Bedding: Place and compact required type of bedding on firm and unyielding undisturbed or compacted trench bottom subgrade.
 - 1. Shape bedding to provide continuous support for bells, joints and barrels of pipes and for joints, fittings and bodies of conduits.
 - 2. After placing each utility section into proper position, alignment and grade, place bedding around utility and carefully compact material around pipe haunches and bring bedding evenly up on both sides and along the full length of utility to avoid damage or displacement of utility system.
 - 3. Backfill over utility with bedding to depth shown on utility trench details shown on Drawings.
- B. Trench Backfill:
 - 1. General trenching: Conform to WSDOT 7.08.3(3).
- C. Coordinate backfilling to allow utilities testing and inspection.
- D. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- E. Place and compact final backfill material to final subgrade.
- F. Warning Tape: Install continuous detectable warning tape directly above utilities, 12 inches below finished grade, 6 inches below subgrade under pavements and slabs or 18 inches above the pipe crown (whichever is deeper).

3.08 MOISTURE CONTROL

- A. Uniformly moisten or aerate trench subgrade and each subsequent backfill layer before compaction to the optimum moisture content to achieve specified density.
 - 1. Provide equipment for applying water uniformly to the subgrade.
 - 2. Do not place backfill or fill material on surfaces that are muddy or frozen.
 - 3. Remove and replace, or scarify and air-dry otherwise suitable material that exceeds optimum moisture content and is too wet to compact to specified density at the Contractor's expense.

4. In wet weather or site conditions, protect exposed subgrade from becoming too wet to allow compaction to a firm and unyielding condition and utilize backfill material that is not moisture sensitive.

3.09 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill materials to the following percentage of maximum dry density as determined by the ASTM D 1557 (Modified Proctor) test procedure:
- B. Utility trench backfill: 95% min. (in paved areas), 90% min. (in unpaved areas)
 1. Range of Moisture Contents for Compaction: +/- 2%
- C. Protect utility line from damage during compaction.
- D. Failure To Achieve Compaction Density: Contractor shall remove and replace any backfill material that fails to meet the specified compaction density or that settles after project completion at their own expense.

3.10 DUST CONTROL

- A. Control and prevent the production of airborne dust due to wind or construction equipment traffic at any time during construction by watering the work area and site, comply with all local and State air quality regulations.
- B. Do not permit conditions on the site that would allow airborne dust resulting from the work of this project to drift onto adjacent properties.

3.11 FIELD QUALITY CONTROL

- A. Contractor Quality Control: Employ / assign quality control personnel to monitor the work of this section for conformance to the requirements of this section and to good construction practices.
 1. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of this section.
 2. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve specified compacted density and other requirements of this section and not rely solely on test data from Testing Agency.
- B. Testing Agency: Contractor will engage a qualified testing agency and Geotechnical Engineer to perform periodic field quality-control testing and review of Contractor's work.
 1. Tests taken are spot checks only at a given location and shall not be interpreted as representing the quality or integrity of all of the work performed.
 2. Test data and reviews shall not be construed as acceptance of the work by the testing agency nor shall it relieve the Contractor of his responsibility to replace non-conforming or failed work.
- C. Coordinate and schedule the work to accommodate inspections and testing as follows:
 1. **Geotechnical Engineer** shall inspect and approve the following:
 - a. Subgrade soils in any utility trench or area of the site that exhibits soft

- or yielding subgrade, prior to any backfill being placed.
 - b. Fill subgrade in any trench under pavements or within the building area after it has been placed and compacted to specified density but prior to any base course being placed or building elements being constructed.
- 2. **Testing Agency** shall inspect and test the following:
 - a. Collect soil samples from each different type of existing soil and imported soil and perform Modified Proctor Compaction Test per ASTM D1557 on each sample to determine maximum dry density / weight of sample and optimum moisture content.
 - b. Each backfill layer, including compaction of trench bottom subgrade disturbed during excavation.
 - c. Areas required by the Geotechnical Engineer or Architect.
- D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D1557, ASTM D2167, ASTM D2922, and ASTM D2937, as applicable. Tests will be performed at the following locations and minimum frequencies:
 - 1. Utility Trenches: At each compacted fill and backfill layer, at least one test for every 1,000 sq. ft. or less of fill, but in no case fewer than three tests.
- E. Provide trench safety provisions for safety of Geotechnical Engineer and Testing Agency personnel during inspections and testing in trenches, including, but not limited to, providing access ladders, ditch boxes and shutting down equipment operation while personnel are in the trench.
- F. When testing agency reports that subgrade or backfill has not achieved compaction density specified, scarify and moisten or aerate, or remove and replace soil to depth and width determined by the Geotechnical Engineer; recompact or replace with compacted backfill and retest at the Contractor's expense, as required to achieve specified compaction density.

3.12 PROTECTION

- A. Protection:
 - 1. Protect backfilled areas from damage due to water, traffic, freezing and erosion.
 - 2. Protect exposed subgrade in trench bottoms from damage due to water, traffic, freezing and erosion. Plan work so that trenches are not left open and exposed.
 - 3. Contactor is responsible for planning and overseeing the work so that trench subgrade is protected from becoming soft, yielding or unsuitable after being exposed, requiring over-excavation and structural fill.
 - 4. Contactor is responsible for planning and overseeing the work so that excavated soil and spoils piles are protected from becoming wet and over optimum moisture content, requiring removal and replacement.
- B. Protect building and utility structures from damage or collapse due to operation of heavy compaction equipment in too close proximity. Use smaller lifts and hand operated compaction equipment around retaining walls and utility structures.
- C. Protect below grade waterproofing from damage during earthwork operations.

- D. 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.
 - 1. Scarify or remove and replace soil material to depth as required by Geotechnical Engineer; reshape and re-compact at the Contractor's expense.
- E. Utilities: Refer to Section 02 1725 for requirements related to existing utilities. The Contractor shall protect from damage all private and public utilities. Adequate provisions shall be made for maintaining all electrical and other underground facilities encountered during construction. Structures which have been disturbed or damaged by the Contractor shall be satisfactorily restored, unless shown for demolition, upon completion of the work.
- F. Pavement: The Contractor shall protect from damage all pavement or paved areas scheduled to remain.
- G. Access Streets and Roadways: Provide wheel cleaning stations to clean wheels and undercarriage of trucks before leaving site, as necessary to prevent dirt from being carried onto public streets. If streets are fouled, they must be cleaned immediately in conformance with Kitsap County, Washington State Department of Ecology, and all governing requirements and regulations.
- H. Repair and / or replacement of damaged facilities will be accomplished at the Contractor's expense.

3.13 CORRECTION OF SUBGRADE SETTLEMENT

- A. Where settlement of subgrade occurs at any time, remove and replace as follows:
 - 1. Inform the Architect and Geotechnical Engineer immediately of any settlement that appears on the site or in the building.
 - 2. Remove affected / failed pavements or building elements and underlying settled soil, under the direction of Geotechnical Engineer if required, until firm, dense and unyielding suitable soil is exposed, backfill with structural fill (or other material as required by Geotechnical Engineer) and compact to specified density, and reconstruct removed pavements or building elements to match original construction.
 - 3. Restore appearance, quality and condition of finished surfaces to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
 - 4. The cost for correction of settlement, including restoration of pavements or building elements, resulting from Contractor's failure to comply with the requirements of the Contract Documents or with the directions from Geotechnical Engineer shall be borne by the Contractor.

3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus existing soil and waste material, including unsuitable soil, trash, boulders and debris and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 2500

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- F. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.
- G. Stormwater Pollution Prevention Plan prepared by BCRA (Appendix B)

1.02 SECTION INCLUDES

- A. Erosion and sediment control measures for site.
- B. Control of temporary stormwater runoff.
- C. Maintaining streets in clean condition.
- D. Prevention of erosion of exposed soil.
- E. Monitor, maintain and supplement silt control and stormwater runoff control measures.
- F. Prevention of airborne dust.
- G. Compliance with the current State Construction Stormwater General Permit / NPDES Permit.
- H. Maintenance and repair of erosion control measures.
- I. Removal of temporary erosion and sediment control measures from the site.

1.03 REFERENCES

- A. All references shall be the latest adopted edition (except where edition date is specifically noted).
- B. ASTM D4355 – Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
- C. ASTM D4397 – Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
- D. ASTM D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- E. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

- F. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of Geotextile
- G. Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February, 2005.
- H. Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010.

1.04 DESIGN CRITERIA

- A. Erosion control measures shall be designed and constructed in accordance with the Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February 2005, the Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010 and any other applicable local regulations.

1.05 DURATION

- A. Maintain erosion and sediment control measures needed to perform the Work of this Contract, including periods when construction activities are reduced or shut down.
- B. Contractor shall maintain erosion and sediment control measures until hydroseeded grass and landscaped areas have become established and site soils are stabilized to prevent any site erosion or turbidity in site stormwater runoff.

1.06 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.
- B. Submit calculations for sizing of Baker tanks or equivalent, if used.

1.07 QUALITY ASSURANCE

- A. Maintain one set of WSDOT Specifications and project plans on site.
- B. Perform work in accordance with the Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February 2005 and the Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010.

1.08 PROJECT CONDITIONS

- V. Refer to Appendix A – Geotechnical Engineering Investigation by Krazan & Associates, Inc. dated August 17, 2010 for information on existing site conditions. Report is included for reference only related to existing site and soil conditions, specific requirements related to the site and soils requirements for this project are shown on the Drawings and included in the Project Manual.

- W. Contractor shall employ the materials, equipment, procedures and management expertise necessary to accomplish erosion and sediment control during wet weather while conforming to the requirements of the Contract Documents.
- X. Existing site subgrade soils may be moisture sensitive. Operating equipment on subgrade that has a moisture content over optimum will result in a soft, mushy subgrade that will require drying out and recompaction or excavation and removal from the site and replacing and compacting with new suitable soils at Contractor's expense. If project schedule permits, schedule work to be accomplished when weather and site conditions are dry; otherwise utilize wet weather materials and procedures and take any measures necessary to protect site soils from becoming unsuitable, unusable or over optimum moisture content.
- Y. Control the flow, collection, channeling and discharge of water on site to prevent damage to subsoil and excavations, to prevent off-site damage of any type and to conform to all ordinances and laws.
- Z. Existing Improvements: Provide protection necessary to prevent damage to existing improvements not indicated for removal. i.e. Bench marks, survey control points, existing structures on adjacent property, sidewalks, paving, and curbs. Restore damaged improvements to their original condition.
- AA. Traffic: Conduct operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- BB. Existing Utilities: Locate, mark and protect existing utilities as specified in Section 02 1725 prior to start of work.

1.09 MAINTENANCE

- A. Monitor and maintain erosion and sediment control measures installed for the duration of the project.
 - 1. Repair or replace any control measures that become damaged or ineffective.
 - 2. Take measures to prevent any erosion or sediment control problems from occurring both on the project site and off site.

1.10 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Contractor shall determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
 - 3. It is not the intent of the Contract Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 2 - PRODUCTS

2.01 SILT FENCES

- A. Filter fabric shall conform to WSDOT Specification 9-33.2 (Table 6) with Geotextile Properties tested and conforming to the following:
 - 1. AOS
 - a. Test Method: ASTM D4751
 - b. Geotextile Property Requirements:
 - 1) 0.60 mm maximum for slit film wovens (#30 sieve)
 - 2) 0.30 mm maximum for all other geotextile types (#50 sieve)
 - 3) 0.15 mm minimum (#100 sieve)
 - 2. Water Permittivity:
 - a. Test Method: ASTM D4491
 - b. Geotextile Property Requirements: 0.02 sec⁻¹ min.
 - 3. Grab Failure Strain, Minimum in machine direction only:
 - a. Test Method: ASTM D4632
 - b. Geotextile Property Requirements: 100 pounds minimum
 - 4. Ultraviolet (UV) Radiation Stability:
 - a. Test Method: ASTM D4355
 - b. Geotextile Property Requirements: 70% strength retained minimum after 500 hours in weatherometer.

2.02 HYDROSEED

- A. Hydroseeding for erosion control shall comply with the requirements of WSDOT Specification 8-01; provide the following Seed Mix:
 - 1. Perennial Rye Grass: 40 % of mix; 90% purity; 90% germination.
 - 2. Creeping Red Fescue: 40 % of mix; 90% purity; 90% germination.
 - 3. Preinoculated White Dutch Clover: 10 % of mix; 95% purity; 90% germ.
 - 4. Highland Bent Grass: 10 % of mix; 90% purity; 90% germination.
- B. Fertilizer: Add 10-20-20 fertilizer to the hydroseed mix.

2.03 STRAW MULCHING

- A. Conform to WSDOT Specification Section 9-14.4(1).

2.04 PLASTIC SHEETING

- A. Clear plastic sheeting shall be minimum 6-mil thick, polyethylene film.
- B. Sandbags shall consist of clean washed sand in a woven polyethylene sack.
- C. Stakes: Wood stakes of size and length required to secure sandbags and rope in place.
- D. Rope: Polyethylene or nylon rope, ¼ inch diameter minimum, or larger size as required to secure plastic sheeting and sandbags in place.

2.05 CATCH BASIN INLET PROTECTION

- A. Catch basin inlet protection shall conform to the details provided on the drawings.

2.06 HIGH VISIBILITY FENCING

- A. Fencing shall meet the requirements of WSDOT Specification Section 9-14.5(8) High Visibility Fencing.

2.07 PIPE MATERIALS

- A. Pipe materials shall be as specified in Section 33 4000.

2.08 ROCK MATERIALS

- A. Quarry spalls shall meet the requirements of WSDOT Specification Section 9-13.6 Quarry Spalls.
- B. Washed gravel shall meet the requirements of WSDOT Specification Section 9-12(4).
- C. Pea Gravel: 3/8 inch minus clean washed pea gravel.

2.09 WATER

- A. Provide water for dust control, including the following:
 - 1. Water truck with provisions for uniformly spreading / spraying water.
 - 2. Fire hose and spray nozzle with fittings and temporary water meter setup for connection to fire hydrant.
 - 3. Connections, fittings and equipment required for connection to water source.
 - 4. Make all arrangements and pay any fees associated with connection to water source, cost of water, etc. Provide, maintain, and pay for suitable quality temporary water service or source required for construction operations. Pay all costs of connection, piping and / or trucking as required to perform the work.

2.10 PORTABLE STORAGE CONTAINERS

- A. Provide Baker tanks or approved equivalent and chemical treatment, as necessary, to meet Washington State Department of Ecology stormwater discharge requirements outlined in the State Construction Stormwater General Permit. Contractor shall bear all costs for mobilizing, maintaining, and demobilizing in addition to all costs associated with disposal of construction stormwater.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall work of this project in a coordinated and efficient manner.
- B. Coordinate exact layout of erosion and sediment control structures to facilitate construction operations and work on the site.

3.02 GENERAL

- A. During construction the runoff of stormwater and wastewater flows shall be controlled and treated to minimize water quality impacts. The Contractor shall plan and execute the work in a manner which protects the project, and downstream waterways.
- B. Stormwater from disturbed areas within the limits of construction shall be collected and treated before releasing. The extent of erosion control measures required will depend on the extent of the Contractor's earthwork and ground cover disturbance and resulting erosion potential. The Contractor is responsible for meeting water quality criteria / all stormwater discharge requirements. The Owner may direct the Contractor to enhance erosion control measures it deems to be inadequate.
- C. Conform to the requirements for coverage under the Construction Stormwater General Permit administered by the Washington State Department of Ecology.

3.03 TEMPORARY CONVEYANCE SYSTEMS

- A. Ditches, pipes, swales, berms, sandbag walls, sumps and other means shall be employed to collect stormwater from the construction area. Materials excavated from swale construction may be used to construct berms.
- B. Ditches and swales shall be scarified, seeded and rolled where used for temporary drainage conveyance.

3.04 GROUND COVER

- A. Do not clear any areas until construction is ready to begin. Disturb only the minimum area necessary to accomplish the work. Cover all disturbed areas with plastic sheeting during any stoppages of work. Protect all disturbed areas, including cleared, stripped, cut, fill, or other areas of reduced plant cover or bare dirt caused by work in this contract, from erosion. Protection shall include plastic sheeting, erosion control matting, temporary seeding, and straw mulch.
- B. Slopes (2 Horizontal to 1 Vertical and Steeper): After earthwork and grading has been completed, cover cut and fill slopes that are 2H:1V and steeper with plastic sheeting secured with stakes and sandbags set on a maximum 20 foot grid or as required to secure sheeting and prevent it from blowing away.
- C. Slopes (Flatter Than 2 Horizontal to 1 Vertical): Hydroseed slopes that are flatter than 2H:1V as specified herein.

3.05 STOCKPILE PROTECTION

- A. Temporary stockpile slopes shall not exceed 2H:1V.
- B. Grade slopes of stockpile uniformly smooth with a slightly concave shape to prevent hollow spots that would allow the plastic sheeting cover to ripple and flap in the wind.
- C. Cover stockpiles with plastic sheeting; install sheeting to fit tight to shape of stockpile free of wrinkles or loose areas; overlap seams two feet and tape down exposed edges continuously.
 - 1. Install sheeting in largest sections possible with minimum number of seams.
 - 2. Secure plastic sheet with stakes, rope and sandbags to prevent it from blowing

- away or from any seam from coming loose.
 - 3. Space stakes and sandbags at no more than a 15 foot grid or as required to secure sheeting.
 - 4. Secure each sandbag with a stake; run rope between each stake (under sandbags).
 - 5. Place stakes and sandbags along all seams.
 - 6. Entire installation shall withstand high winds for an entire winter without the plastic sheeting coming loose or blowing away.
- D. Stockpile imported materials and excavated native soil materials well away from edges of excavations or the crest of any slopes.
- 1. Stockpiles shall not be placed on pervious pavement or in raingarden areas.
 - 2. Stockpile soil materials downstream of pervious pavement and raingarden areas.

3.06 EARTHWORK

- A. Do not cause foreign or waste material to enter surface waters. Materials shall be carefully excavated and moved to an approved spoil or waste area.
- B. Earthwork slopes shall be left in a condition that will minimize erosion during rainfall. This includes temporary erosion control as specified herein.

3.07 DUST CONTROL

- A. Control and prevent the production of airborne dust due to wind or construction equipment traffic at any time during construction by watering the work area and site, comply with all local and State air quality regulations.
- B. Do not permit conditions on the site that would allow airborne dust resulting from the work of this project to drift onto adjacent properties.
- C. Wet down unpaved roadways used for construction traffic to prevent dust.

3.08 HYDROSEEDING

- A. Hydroseed bare exposed soil disturbed by the work of this project except in the following areas:
 - 1. Slopes covered with plastic sheeting.
- B. Hydroseed mix shall be applied at the following rates:
 - 1. Seed mix at rate of 100 pounds per acre.
 - 2. Fertilizer at rate of 500 pounds per acre.
 - 3. Mulch at rate of 2000 pounds per acre.
 - 4. Soil stabilizer at rate of 40 pounds per acre.
- C. Apply water to hydroseeded areas as required for seeds to germinate, root and grow vigorously; maintain hydroseeded areas through Final Completion.

3.09 SITE RESTORATION

- A. As soon as practical after completion of a portion of the Work, or when a work or

waste area is no longer required, commence site restoration.

3.10 PROTECTION, MAINTENANCE AND REPAIR

- A. Maintain and repair erosion control facilities throughout construction until Final Completion and leave in place for the next phase contractor's use.
- B. Protection:
 - 1. Where possible, maintain natural / existing vegetation for silt control.
 - 2. Prevent silt-laden water from leaving the site or from entering offsite storm sewer system.
 - 3. Stabilize slope, cut or fill areas where work is stopped for more than 30 days by mulching, polyethylene sheeting or other method to prevent erosion and sediment transport.
 - 4. Keep pavements, roadways, sidewalks, and emergency access clean from construction activities. Keep paved areas clean using mechanical sweeping equipment and hand tools as applicable; pavement washing is not allowed.
 - 5. Keep pervious pavement clear of any stockpiled material.
 - 6. Prevent vehicular traffic from construction vehicles and equipment on pervious pavement.
- C. Supplementary Measures: Provide additional silt and erosion control measures as required to protect soils and prevent silt-laden runoff from leaving the project site.
- D. Maintenance: Monitor and maintain temporary silt and erosion control measures for the duration of the project.
- E. Inspection: Inspect the entire system to ensure proper operation a minimum of once per week, during and after storms and prior to weekends and holidays.

3.11 REMOVAL

- C.
 - A. Remove temporary erosion control facilities only after site soils are stabilized to prevent any erosion or turbidity in stormwater runoff from the site during a heavy rain storm event.

END OF SECTION

SECTION 32 1100

BASE COURSE

PART 4 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Aggregate base for asphalt and cement concrete pavements.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- D. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
- F. WSDOT Specification: Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition. (Delete Measurement and Payment Provisions.)

1.04 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.

1.05 WEATHER LIMITATIONS

- A. Do not place aggregate when base surface temperature is less than 35 degrees F, nor when air temperature is below 35 degrees F. Do not place aggregate when surface is wet or frozen. Do not place aggregate when weather conditions are unfavorable otherwise.

PART 2 - PRODUCTS

2.04 BASE COURSE MATERIAL

- A. Crushed Surfacing Base Course (CSBC) conforming to WSDOT Standard Specifications 9-03.9(3).

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other trades that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.

3.02 EXAMINATION

- A. Verify that compacted subgrade and granular base is dry, compacted to specified density and ready to support paving and imposed loads.
- B. Proof-roll sub-base to check for unstable areas or areas requiring additional compaction.
- C. Verify gradients and elevations of base are correct.
- D. Placement of base course indicates acceptance of the subgrade by installer.

3.03 CONSTRUCTION – BASE COURSE

- A. Place granular base course over properly compacted subgrade to compacted thickness shown on Drawings.
- B. Grade crushed surfacing base course accurately for proper slope and elevation.
- C. Compact crushed surfacing base course to 95% of maximum dry density as determined by ASTM Test Method D1557 (Modified Proctor).
- D. Check the elevation, surface tolerances and slopes of compacted crushed surfacing base course using a level and 10' straightedge to confirm proper flatness and drainage. Regrade and recompact any areas that do not conform at the Contractor's expense.

3.04 FIELD QUALITY CONTROL

- A. Contractor Quality Control: Employ / assign quality control personnel to monitor the work of this section for conformance to the requirements of this section and to good construction practices.
 - 1. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of this section.
 - 2. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve specified compacted density and other requirements of this section and not rely solely on test data from Testing Agency.
- B. Testing Agency: Contractor will engage a qualified testing agency and Geotechnical Engineer to perform periodic field quality-control testing and review of Contractor's

work.

1. Tests taken are spot checks only at a given location and shall not be interpreted as representing the quality or integrity of all of the work performed.
 2. Test data and reviews shall not be construed as acceptance of the work by the testing agency nor shall it relieve the Contractor of his responsibility to replace non-conforming or failed work.
- C. Coordinate and schedule the work to accommodate inspections and testing as follows:
1. Geotechnical Engineer shall provide recommendations to achieve compaction density in the event of failure to obtain compaction density
 2. Testing Agency shall inspect and test the following:
 - a. Subgrade prior to placement of base course or paving.
 - b. Base and top course compaction density.
 - c. Areas required by the Geotechnical Engineer.
- D. Testing agency will test compaction of soils in place according to ASTM D 1557 and ASTM D 2922, as applicable. Tests will be performed at the following locations and minimum frequencies:
1. Base and Top Course under Pavement: At each compacted layer, at least one test for every 1,000 sq. ft. or less, but in no case fewer than three tests.
- E. When Geotechnical Engineer and / or testing agency reports that subgrade has not achieved degree of compaction density specified, remove and replace soil to depth and width determined by the Geotechnical Engineer; recompact or replace with compacted structural fill and retest at the Contractor's expense, as required to achieve specified compaction density.

END OF SECTION

SECTION 32 1313

PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Exterior site concrete work including: Concrete paving.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute
- C. ACI 304R - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete; American Concrete Institute
- D. ACI 305R - Hot Weather Concreting; American Concrete Institute
- E. ACI 306R - Cold Weather Concreting; American Concrete Institute
- F. ANSI-A117.1-03 Chapters 3 and 4.
- G. ASTM C33 - Standard Specification for Concrete Aggregates
- H. ASTM C94 - Standard Specification for Ready-Mixed Concrete
- I. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete
- J. ASTM C150 - Standard Specification for Portland Cement
- K. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- L. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete
- M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- N. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

- O. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars
- P. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (nonextruding and Resilient Bituminous Types)
- Q. WSDOT Specification: Standard Specification for Road, Bridge and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition issued prior to bid date. (Delete Measurement and Payment Provisions.)

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain concrete materials from same source throughout.
- C. Conform to ACI 305R when concreting during hot weather.
- D. Conform to ACI 306R when concreting during cold weather.

1.05 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.
- B. Product Data:
- C. Design Mixes: For each concrete mix, submit proposed mix designs a minimum of 15 days in advance of placing operations for each type of concrete. The submitted mix designs shall include the following:
 - 1. Supporting test data for mixes that is not more than 12 months old. Include a sufficient number of tests and conduct a statistical analysis in compliance with ACI 301.
 - 2. Gradation of fine and coarse aggregates not more than 90 days old showing compliance with ASTM C33.
 - 3. Proportions of all materials fine and coarse aggregate and water, including all admixtures added either at the time of batching or at the job site. Aggregate weights shall be based upon saturated surface dry conditions.
 - 4. Water/cement ratio.
 - 5. Slump as measured according to ASTM C143. Provide slump test for each mix.
 - 6. Air content of freshly mixed concrete as measured according to ASTM C231.
 - 7. Range of ambient temperature and humidity for which design is valid.
 - 8. Strength measured at 7 and 28 days. Provide strength test for each mix at a frequency of both the 7th and 28th day.
 - 9. Locations or intended use of each mix design.
 - 10. Materials and methods for curing concrete.
 - 11. Source of all materials.

1.06 JOB CONDITIONS

- A. Weather Conditions:
 - 1. Do no paving work when raining or when subgrade or base has free water on the surface or does not meet compaction requirements; suspend operations until surfaces are adequately dry.
 - 2. Mixing and placing concrete shall be discontinued when a descending air temperature in the shade away from artificial heat reaches 40 degrees F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F unless authorized by the Engineer.
- B. Subgrade Conditions: Subgrade shall be firm and unyielding, free of ponded water, frozen earth or any organic material.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.

2.02 CONCRETE MATERIALS

- A. For cement concrete pavement furnish Portland Cement Concrete in accordance with WSDOT 5-05.
 - 1. Cement: Type I or II Portland cement conforming to ASTM C150, gray color.
 - 2. Concrete Aggregate: Sand and gravel aggregates conforming to ASTM C33.
 - 3. Slag: Ground granulated blast furnace slag conforming to ASTM C989 Grade 100 or 120.
 - 4. Fly Ash: Conform to ASTM C618, Class C or F.
 - 5. Water: Clean, potable, free of any substances or contaminants adversely affecting concrete.
 - 6. Air Entrainment: Use air entrainment admixture conforming to ASTM C260.
 - 7. Admixtures: Water reducing agents are permitted, calcium is not allowed.

2.03 CONCRETE MIXING

- A. Mix concrete and deliver in accordance WSDOT 5-05.

2.04 JOINTS MATERIALS

- A. Pavement Joint Materials:

1. Preformed Joint Filler: Resilient bituminous type, Sternson Ltd. "Flexcell", Grace Construction Products "Fiber", Homosote Co. "Homex 300", Old North Mfg. Co., Inc. "Gray-Flex", or approved, non-extruding type, full depth of slab as required to bring top to within 1/4 inch of surface of slab, conforming to ASTM D1751.

2.05 ACCESSORIES

- A. Curing Compound: Clear, membrane forming, conform to ASTM C309, Type I, Class B; curing compound shall not permanently discolor concrete.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.

3.02 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Refer to Section 32 1100 for Base Course.

3.03 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Confirm that top of form and screed elevations will provide positive water drainage off completed concrete work.
- C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- D. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.06 JOINTS

- A. Locate construction and contraction/score joints as shown on drawings or directed by Engineer. Lay out joints for equal spacing except where specifically dimensioned otherwise on Drawings.
- B. Provide joints in accordance with WSDOT 5-05.3(8).

3.07 FINISHING

- A. Place curing compound on exposed concrete surfaces immediately after finishing. Apply at application rate required to achieve restriction of water loss not less than required by ASTM C309 in accordance with manufacturer's instructions.
- B. Provide finishing in conformance with WSDOT 5-05.3(11)

3.08 TOLERANCES

- A. Cement concrete pavement shall not pond water.
- B. Crosswalk cross slope shall not exceed 2.00%.

3.09 CURING

- A. Cement concrete curing shall be in conformance with WSDOT 5-05.3(13).

3.10 JOINT SEALING

- A. Cement concrete joint sealing shall be in conformance with WSDOT 5-05.3(8)

3.11 PROTECTION

- A. Cement concrete protection shall be in conformance with WSDOT 5-05.3(16).
- B. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- C. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.
- D. Do not permit vehicular traffic over pavement until concrete paving has developed minimum strength of 4,000 psi.

END OF SECTION

SECTION 32 1540

CRUSHED STONE SURFACING

PART 4 - GENERAL

1.01 RELATED DOCUMENTS

- B. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Aggregate for gravel roadway.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- D. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
- F. WSDOT Specification: Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition. (Delete Measurement and Payment Provisions.)

1.04 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.

1.05 WEATHER LIMITATIONS

- A. Do not place aggregate when base surface temperature is less than 35 degrees F, nor when air temperature is below 35 degrees F. Do not place aggregate when surface is wet or frozen. Do not place aggregate when weather conditions are unfavorable otherwise.

PART 5 - PRODUCTS

2.05 TOP COURSE MATERIAL

- A. Crushed Surfacing Top Course (CSTC) conforming to WSDOT Standard Specifications 9-03.9(3).

PART 6 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other trades that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.

3.02 EXAMINATION

- A. Verify that compacted subgrade is dry, compacted to specified density and ready to support paving and imposed loads.
- B. Proof-roll sub-base to check for unstable areas or areas requiring additional compaction.
- C. Verify gradients and elevations of base are correct.
- D. Placement of top course indicates acceptance of the subgrade by installer.

3.03 CONSTRUCTION

- A. Place aggregate material over properly compacted subgrade to compacted thickness shown on Drawings.
- B. Grade crushed surfacing top course accurately for proper slope and elevation.
- C. Compact crushed surfacing top course to 95% of maximum dry density as determined by ASTM Test Method D1557 (Modified Proctor).
- D. Check the elevation, surface tolerances and slopes of compacted crushed surfacing top course using a level and 10' straightedge to confirm proper flatness and drainage. Regrade and recompact any areas that do not conform at the Contractor's expense.

3.04 FIELD QUALITY CONTROL

- F. Contractor Quality Control: Employ / assign quality control personnel to monitor the work of this section for conformance to the requirements of this section and to good construction practices.
 - 3. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of this section.
 - 4. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve specified compacted density and other requirements of this section and not rely solely on test data from Testing Agency.
- G. Testing Agency: Contractor will engage a qualified testing agency and Geotechnical Engineer to perform periodic field quality-control testing and review of Contractor's work.
 - 3. Tests taken are spot checks only at a given location and shall not be interpreted as representing the quality or integrity of all of the work performed.

4. Test data and reviews shall not be construed as acceptance of the work by the testing agency nor shall it relieve the Contractor of his responsibility to replace non-conforming or failed work.
- H. Coordinate and schedule the work to accommodate inspections and testing as follows:
3. Geotechnical Engineer shall provide recommendations to achieve compaction density in the event of failure to obtain compaction density
 4. Testing Agency shall inspect and test the following:
 - d. Subgrade prior to placement of base course or paving.
 - e. Base and top course compaction density.
 - f. Areas required by the Geotechnical Engineer.
- I. Testing agency will test compaction of soils in place according to ASTM D 1557 and ASTM D 2922, as applicable. Tests will be performed at the following locations and minimum frequencies:
2. Top Course: At each compacted layer, at least one test for every 1,000 sq. ft. or less, but in no case fewer than three tests.
- J. When Geotechnical Engineer and / or testing agency reports that subgrade has not achieved degree of compaction density specified, remove and replace soil to depth and width determined by the Geotechnical Engineer; recompact or replace with compacted structural fill and retest at the Contractor's expense, as required to achieve specified compaction density.

END OF SECTION

SECTION 32 1613

CONCRETE SIDEWALKS AND CURBS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- B. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Exterior site concrete work including: Sidewalks and curb and gutter.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute
- C. ACI 304R - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete; American Concrete Institute
- D. ACI 305R - Hot Weather Concreting; American Concrete Institute
- E. ACI 306R - Cold Weather Concreting; American Concrete Institute
- F. ANSI-A117.1-03 Chapters 3 and 4.
- G. ASTM C33 - Standard Specification for Concrete Aggregates
- H. ASTM C94 - Standard Specification for Ready-Mixed Concrete
- I. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete
- J. ASTM C150 - Standard Specification for Portland Cement
- K. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- L. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete
- M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- N. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

- O. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars
- P. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (nonextruding and Resilient Bituminous Types)
- Q. WSDOT Specification: Standard Specification for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition issued prior to bid date. (Delete Measurement and Payment Provisions.)

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain concrete materials from same source throughout.
- C. Conform to ACI 305R when concreting during hot weather.
- D. Conform to ACI 306R when concreting during cold weather.

1.05 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.
- B. Product Data:
- C. Design Mixes: For each concrete mix, submit proposed mix designs a minimum of 15 days in advance of placing operations for each type of concrete. The submitted mix designs shall include the following:
 - 3. Supporting test data for mixes that is not more than 12 months old. Include a sufficient number of tests and conduct a statistical analysis in compliance with ACI 301.
 - 4. Gradation of fine and coarse aggregates not more than 90 days old showing compliance with ASTM C33.
 - 5. Proportions of all materials fine and coarse aggregate and water, including all admixtures added either at the time of batching or at the job site. Aggregate weights shall be based upon saturated surface dry conditions.
 - 6. Water / cement ratio.
 - 7. Slump as measured according to ASTM C143. Provide slump test for each mix.
 - 8. Air content of freshly mixed concrete as measured according to ASTM C231.
 - 9. Range of ambient temperature and humidity for which design is valid.
 - 10. Strength measured at 7 and 28 days. Provide strength test for each mix at a frequency of both the 7th and 28th day.
 - 11. Locations or intended use of each mix design.
 - 12. Materials and methods for curing concrete.
 - 13. Source of all materials.

1.06 PROJECT CONDITIONS

- A. Weather Conditions:

1. Do no paving work when raining or when subgrade or base has free water on the surface or does not meet compaction requirements; suspend operations until surfaces are adequately dry.
 2. Mixing and placing concrete shall be discontinued when a descending air temperature in the shade away from artificial heat reaches 40 degrees F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F unless authorized by the Engineer.
- B. Subgrade Conditions: Subgrade shall be firm and unyielding, free of ponded water, frozen earth or any organic material.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.

2.02 CONCRETE MATERIALS

- A. For cement concrete sidewalks furnish Portland Cement Concrete in accordance with WSDOT 8-14. For cement concrete curbs and gutters furnish Portland Cement Concrete in accordance with WSDOT 8-04.
1. Cement: Type I or II Portland cement conforming to ASTM C150, gray color.
 2. Concrete Aggregate: Sand and gravel aggregates conforming to ASTM C33.
 3. Slag: Ground granulated blast furnace slag conforming to ASTM C989 Grade 100 or 120.
 4. Fly Ash: Conform to ASTM C618, Class C or F.
 5. Water: Clean, potable, free of any substances or contaminants adversely affecting concrete.
 6. Air Entrainment: Use air entrainment admixture conforming to ASTM C260.
 7. Admixtures: Water reducing agents are permitted, calcium is not allowed.

2.03 CONCRETE MIXING

- A. Mix concrete and deliver in accordance with 8-14 for sidewalks.
- B. Mix concrete and deliver in accordance with 8-04 for curbs and gutters.

2.04 JOINTS MATERIALS

- A. Pavement Joint Materials:
1. Preformed Joint Filler: Resilient bituminous type, Sternson Ltd. "Flexcell", Grace Construction Products "Fiber", Homosote Co. "Homex 300", Old North Mfg. Co., Inc. "Gray-Flex", or approved, non-extruding type, full depth of slab

as required to bring top to within 1/4 inch of surface of slab, conforming to ASTM D1751.

2.05 ACCESSORIES

- A. Curing Compound: Clear, membrane forming, conform to ASTM C309, Type I, Class B; curing compound shall not permanently discolor concrete.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other sections that interface with, affect or are affected by the work of this section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.

3.02 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Refer to Section 32 1100 for Base Course.

3.03 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Confirm that top of form and screed elevations will provide positive water drainage off completed concrete work.
- C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- D. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.06 JOINTS

- A. Locate expansion and contraction / score joints as shown on drawings or directed by Engineer. Lay out joints for equal spacing except where specifically dimensioned otherwise on Drawings.
- B. Align curb, gutter, and sidewalk joints.
- C. Place 1/2 inch wide isolation joints where necessary to separate paving from vertical surfaces and other surface features.
- D. Provide contraction / score joints:
 - 1. At equal spacing between expansion joints.

3.07 FINISHING

- A. Exterior Cement Concrete Sidewalks:
 - 1. Broomed Finish: Medium-light broom finish.
 - 2. Expansion and Contraction Joints: Tool edges and conform to detail on Drawings.
- B. Place curing compound on exposed concrete surfaces immediately after finishing. Apply at application rate required to achieve restriction of water loss not less than required by ASTM C309 in accordance with manufacturer's instructions.

3.08 TOLERANCES

- A. Sidewalks cross slope shall not exceed 2.0% and shall not pond water.
- B. Conform to requirements of ANSI-117 as applicable to sidewalks and public walkways.

3.09 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION

SECTION 32 1713

WHEELSTOPS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including Division 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. Precast concrete wheelstops

1.03 REFERENCES

- A. All references shall be the latest adopted edition.
- B. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- C. ASTM C33 - Standard Specification for Concrete Aggregates
- D. ASTM C150 - Standard Specification for Portland Cement
- E. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete
- F. WSDOT Specification: Standard Specification for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation. (Delete Measurement and Payment Provisions.)
- G. WSDOT Standard Plans for Road and Bridge and Municipal Construction: Standard plans prepared by the Washington State Department of Transportation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wheelstop Parking Bumpers: Precast concrete, conforming to the following:
 - 1. Nominal Size: 6 inches high, 8 - 10 inches wide, 6 feet long.
 - 2. Profile: WSDOT/APWA Precast Cement Concrete Bumper Curb Standard Plan F-1.
 - 3. Cement: ASTM C150, Portland Type I - Normal; gray color.
 - 4. Concrete Materials: ASTM C33; water and sand.
 - 5. Reinforcing Steel: ASTM A615, deformed steel bars; unfinished, strength and size commensurate with precast unit design.
 - 6. Air Entrainment Admixture: ASTM C260.
 - 7. Concrete Mix: Minimum 4000 psi, 28 day strength, air entrained to 5 to 7 percent.
 - 8. Use rigid molds, constructed to maintain precast units uniform in shape, size

and finish. Maintain consistent quality during manufacture.

9. Embed reinforcing steel in concrete.
10. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
11. Minor patching in plant is acceptable, providing appearance of units is not impaired.

B. Attachment:

1. Asphalt Pavement - Dowels: #6 reinforcing steel bar; 24 inches minimum length.
2. Concrete Pavement – Adhesive and Dowels: Epoxy adhesive suitable for permanent attachment to concrete and dowels: #6 reinforcing steel bar; 24 inches minimum length.
3. Gravel – Dowels: Dowels: #6 reinforcing steel bar; 24 inches minimum length.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other trades that interface with, affect or are affected by the work of this Section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.

3.02 INSTALLATION

- A. Install units in locations noted on the Drawings without damage to shape or finish. Replace or repair damaged units.
- B. Install units in straight or square alignment with adjacent work.
- C. Secure wheelstops in the proper location as follows:
 1. Asphalt Pavement: Drive reinforcing steel dowel through holes cast in wheelstops into pavement and subgrade below; top of dowel shall be driven flush with top of wheelstop.
 2. Concrete Pavement: Adhere unit to concrete subsurface securely with epoxy adhesive and dowels.
 3. Gravel: Adhere unit to gravel subsurface securely with dowels.
 4. Asphalt Pavement: Adhere unit to asphalt subsurface securely with dowels.

END OF SECTION

SECTION 32 1723

PAVEMENT MARKINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- C. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Lines, letters, graphics and symbols painted onto pavement.
- B. Painted curbs.

1.03 REFERENCES

- A. References shall be the latest adopted edition.
- B. WSDOT Specification: Standard Specification for Road, Bridge and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition issued prior to bid date. (Delete Measurement and Payment Provisions.)

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience.

1.05 PROJECT CONDITIONS

- A. Apply painted pavement markings only to dry surfaces when air temperature is 50 degrees or above.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Pavement and Curb Marking Paint: Quick-drying acrylic latex traffic marking paint conforming to WSDOT 8-22.
- B. Templates: Provide stencil templates for painting directional arrows, handicap symbols, letters, etc.; match configuration shown on Drawings or as directed by the Engineer.
- C. Colors:
 - 1. Parking/Traffic Lines and Lettering: White
 - 2. Drop Off/No Parking Zone Lines: White
 - 3. Traffic Symbols: White
 - 4. Handicap Parking Symbol: White and ADA Blue
 - 5. Fire Lane Curbs: Red

PART 3 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other trades that interface with, affect or are affected by the work of this Section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.
- B. Do not start the work of this Section until landscaping work and heavy construction traffic on site is complete.

3.02 EXAMINATION

- A. Verify that pavement is clean, dry and ready to receive paint markings.

3.03 PREPARATION

- A. Layout the parking lines accurately as shown on the Drawings. Advise the Engineer of any discrepancies in the layout prior to proceeding.
- B. Provide barricades and signage to prevent traffic from crossing wet paint.
- C. Beginning of installation indicates acceptance of conditions and confirmation that line layout and pavement dimensions shown on the Drawings can be achieved with the pavement and layout constructed.

3.04 INSTALLATION

- A. Install 2 coats of marking paint using spray equipment designed for pavement marking in accordance with manufacturer's instructions and WSDOT 8-22.
- B. Apply lines and markings to accurately reflect the line layout shown on Drawings.
- C. Parking and traffic lines shall be a consistent 4 inches in width, straight, and have clean edges; other lines shall be width shown on the Drawings or as directed by the Engineer.
- D. Parking lines shall be parallel and of equal length.
- E. Use templates for painting arrows, letters, graphics, and stop bars.

3.05 TOLERANCES

- A. Maximum Variation From True Position: 1-inch.

END OF SECTION

**SECTION 32 9200
TURF AND GRASSES**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SUMMARY

- A. Section Includes
 - 1. Hydroseeding
 - 2. Seeding
 - 3. Erosion Control Materials

1.03 REFERENCES

- A. American Society for Testing and Materials, (ASTM International)
 - 1. ASTM D 5268 – Standard Specification for Topsoil Used for Landscaping Purposes.

1.04 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- D. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- E. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

- G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- H. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.05 SUBMITTALS

- A. Refer to Section 01 33 00 for submittal procedures.
- B. Product Data: For each type of product indicated.
- C. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
- D. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- E. Material Test Reports: For standardized ASTM D 5268 topsoil; existing in-place surface soil and imported or manufactured topsoil.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
 - 1. Experience: Five years' experience in turf installation.
 - 2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 3. Pesticide Applicator: State licensed, commercial.

1.07 DELIVERY, STORAGE & HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.08 PROJECT CONDITIONS

- A. Coordinate work with installation of other site work including irrigation and planting.
- B. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- C. Planting Restrictions: Install seed during the spring and summer months once the soil temperature has reached 60 degrees F (16 degrees C)
- D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.
 - 1. With operable automatic irrigation system in place, Owner's Representative may authorize work between the spring and fall planting seasons.
- E. Any structures or facilities damaged due to Work of this Section shall be restored equal or better to their original condition at Contractor's expense and to the satisfaction of the Owner's Representative at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Grass Seed Mix: Seed of grass species as follows, with not less than 95 percent germination, not less than 100 percent pure seed, and not more than 0.0 percent weed seed:
 - 1. Products: Subject to compliance with requirements, provide seed mix that meets the following or approved equal:
 - a. 60% Perennial Ryegrass, 30% Creeping Red Fescue, 10% Kentucky Bluegrass
 - 2. Regional Materials Credit MRc5: Concrete Materials shall be extracted, processed and manufactured regionally within 500 miles of this project site.

2.02 PLANTING SOILS

- A. Planting Soil: See Section 32 9300 "Plants."

2.03 TOP DRESSING

- A. Top dressing for hand seeding small areas where machine seeding is not feasible (not needed with seeding machine or hydroseeding):

1. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed peat moss, having a water-absorbing capacity of 1100 to 2000 percent.
2. Compost Mulch: See Section 32 9300, "Plants."

2.04 HERBICIDES

- A. Post-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed eradication. "Round-Up," or approved equal.

2.05 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed stray of wheat, rye, oats or barley.
- B. Fiber Mulch: Bio-degradable, dyed-wood, cellulose-fiber mulch; non-toxic and free of plant growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5-6.5.
- C. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; non-toxic and free of plant-growth or germination inhibitors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.02 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 hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.03 HERBICIDE APPLICATION

- A. Spray pre-emergent and post-emergent herbicides as required to eradicate and prevent emergence of noxious weed growth.
 - 1. Apply pre-emergent and post-emergent herbicides or a mixture of pre-emergent herbicides over all areas of weed or grass growth within landscaped area to eradicate weed growth. Apply in single application at manufacturer's maximum recommended rate, as follows:
 - a. Apply after soil preparation has been completed and approved by Owner's Representative.
 - b. Do not till pre-emergent herbicide into soil.
 - c. Observe manufacturer's recommended "waiting" period prior to working and seeding in treated areas.

3.04 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches in both high-traffic and low-traffic areas. Remove stones larger than 1 inch in high-traffic areas. In low traffic areas, remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. If lime is required by soils analysis report, mix lime with dry soil before mixing fertilizer.

2. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
- C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 2. Loosen surface soil to a depth of at least 4 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply fertilizer directly to surface soil before loosening.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Restore planting areas if eroded or otherwise disturbed after finish grading.

3.05 SEEDING NEW LAWNS

- A. Notify Owner's Representative for approval of seed bed prior to seeding.
- B. Do not use wet seed or seed that is moldy or otherwise damaged.
- C. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
- D. Sow seed at a total rate of 8 lbs. per 1,000 square feet or per manufacturer recommendation.
- E. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water thoroughly with fine spray.
- F. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets and installed and stapled according to manufacturer's written instructions.
- G. Protect seeded areas with slopes not exceeding 1:4 by spreading straw mulch. Spread uniformly to form a continuous blanket 1-inch in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
- H. Top Dressing: (Not needed with seeding machine or hydroseeding) Protect hand-seeded areas from hot, dry weather or drying winds by applying compost mulch or peat mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 1/4-3/16 inch, and roll surface smooth.

- I. Reseeding: reseed areas failing to show uniform stands of grass at 10-day intervals until satisfactory stand is achieved.

3.06 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 1. Mix slurry with fiber-mulch, or manufacturer's recommended non-asphaltic tackifier.
 2. Areas with a gradient less than 3 horizontal to 1 vertical: Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 2,000-pounds per acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
 3. Areas with slope gradient equal or greater than 3 horizontal to 1 vertical: Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 1,000 pounds per acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply second slurry cover coat of fiber mulch (hydromulching) at a rate of 2,000 lb/acre.
- B. Keep hydromulch and seed out of planting beds and off walks, structures and areas not to be seeded. Clean up overspray of hydromulch onto these areas. Keep mulch and seed out of plant beds and other areas by mechanical means or selective herbicide if encroachment occurs. Clean up those areas to the satisfaction of the Owner's Representative.

3.07 TURF LAWN MAINTENANCE

- A. Establish and maintain turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Establishment: If lawns are not established before the dormant period, maintain for a period of 60 calendar days minimum after the dormant period and until Final Acceptance. The dormant period is November 15th to March 1st.

- C. Watering: If automatic irrigation system is off or inoperable for more than 72 hours, install and maintain temporary piping, hoses and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
- D. Mowing: Mow turf as soon as top growth has reached 4 inches. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.

3.08 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by the Owner's Representative:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 square foot area, and bare spots not exceeding 4 by 4 inches.
 - 2. Satisfactory Sodded Turf: at end of maintenance period, a healthy, well-rooted even colored, viable turf has been established, free of weeds, open joints, bare areas and surface irregularities.
- B. Ensure that seed establishment occurs prior to October 15. Lawns that are not satisfactorily established at this time shall be sodded at no additional cost to the Owner.
- C. Where observed landscape work does not comply with the requirements, replace rejected work and use specified materials to reestablish lawns and continue maintenance until lawns are satisfactory.

3.09 CLEANUP & PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove non-degradable erosion-control measures after grass establishment period.

END OF SECTION

**SECTION 32 9300
PLANTS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

- A. Plants.
- B. Planting soils.
- C. Tree stabilization.

1.03 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.
- D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.
- E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

- H. Finish Grade: Elevation of finished surface of planting soil.
- I. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- K. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- L. Planting Area: Areas to be planted.
- M. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- O. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
- Q. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- R. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- S. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.04 SUBMITTALS

- A. Refer to RFP Section 01 33 00 for submittal procedures.
- B. Product Data: For each type of product indicated, including soils.
 - 1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
 - 2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.

3. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
- C. Samples for Verification: For each of the following:
 1. Trees and Shrubs: Three samples of each variety and size delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
 2. Organic Mulch: 1-pint volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
 - D. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.
 - E. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following
 1. Manufacturer's certified analysis of standard products.
 - F. Material Test Reports: For standardized ASTM D 5268 topsoil.
 - G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.
 - H. Warranty: Sample of special warranty.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
 1. Experience: Five years' experience in landscape installation.
 2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 3. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
 4. Pesticide Applicator: State licensed, commercial.
- B. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation

of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
 2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Landscape Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
 3. Report suitability of tested soil for plant growth.
 - a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.
- C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
 1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
 2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
- E. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 1. Notify Landscape Architect of sources of planting materials five business days in advance of delivery to site.
- F. Pre-installation Conference: Conduct conference at Project site.

1.06 DELIVERY, STORAGE & HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

- B. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

- C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

- D. Handle planting stock by root ball

- E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material
 2. Do not remove container-grown stock from containers before time of planting.
 3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

- B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of each service or utility.
 2. Do not proceed with interruption of services or utilities without Construction Manager's written permission.

- C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Planting: March – May
 2. Fall Planting: September 15th – November 1st

- D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.
- E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
 - 1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.08 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty performance of tree stabilization.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Periods from Date of Substantial Completion:
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
 - 3. Include the following remedial actions as a minimum:
 - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
 - d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.09 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
 - 1. Maintenance Period: 12 months from date of Substantial Completion.
- B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: Twelve months from date of Substantial Completion.
- C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.01 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
 2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.
- E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.02 FERTILIZERS

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.03 PLANTING SOILS

- A. Planting Soil: ASTM D 5268 topsoil, with pH range of 6.5 to 7 for lawn/turf areas and 7.5 to 8.5 for planting areas, organic matter content of 2 to 7% by weight; free of stones 3/4 inch or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
- B. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs, or marshes.
 - 1. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 3/4 inch or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and brome grass; not infested with nematodes; grubs; or other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.

2.04 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
 - 1. Type: Wood and bark chips
 - 2. Size Range: 3 inches maximum, 1/2 inch minimum.
 - 3. Color: Natural.

2.05 WEED-CONTROL BARRIERS

- A. Not Used.

2.06 PESTICIDES

- A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.07 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:
 - 1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
 - 2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
 - 3. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.
 - 4. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
 - 5. Guy Cables: Five-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.
 - 6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.
 - 7. Proprietary Staking-and-Guying Devices: Proprietary stake and adjustable tie systems to secure each new planting by plant stem; sized as indicated and per manufacturer's written recommendations.

- B. Root-Ball Stabilization Materials:
 - 1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated; stakes pointed at one end.
 - 2. Wood Screws: ASME B18.6.1.

2.08 MISCELLANEOUS PRODUCTS

- A. Wood Pressure-Preservative Treatment: AWPA C2, with waterborne preservative for soil and freshwater use, acceptable to authorities having jurisdiction, and containing no arsenic; including ammoniacal copper arsenate, ammoniacal copper zinc arsenate, and chromated copper arsenate.

- B. Root Barrier: Black, molded, modular panels manufactured with 50 percent recycled polyethylene plastic with ultraviolet inhibitors, 85 mils (2.2 mm) thick, with vertical root deflecting ribs protruding 3/4 inch (19 mm) out from panel, and each panel 24 inches (610 mm) wide.

- C. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

- D. Burlap: Non-synthetic, biodegradable

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area..
 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.
- D. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

3.03 PLANTING AREAS ESTABLISHMENT

- A. Loosen subgrade of planting areas to a minimum depth of 4 inches (100 mm). Remove stones larger than 3/4 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Apply superphosphate fertilizer directly to subgrade before loosening.
 2. Thoroughly blend planting soil off-site before spreading.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer.
 3. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

- a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.
- B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.04 EXCAVATION FOR TREES & SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 1. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
 - 2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
 - 3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 - 4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
 - 5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
 - 6. Maintain supervision of excavations during working hours.
 - 7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
 - 8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.
- B. Subsoil and topsoil removed from excavations may not be used as planting soil.
- C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

3.05 TREE, SHRUB & VINE PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball

to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

- C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
 - 1. Use planting soil for backfill.
 - 2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.

- D. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
 - 1. Use planting soil Insert drawing designation for backfill.
 - 2. Carefully remove root ball from container without damaging root ball or plant.
 - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.

- E. Set fabric bag-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
 - 1. Use planting soil for backfill.
 - 2. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water

- thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
- F. Set and support bare-root stock in center of planting pit or trench with root flare 1 inch above adjacent finish grade.
1. Use planting soil for backfill..
 2. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots.
 3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside soil-covered roots about 1 inch from root tips; do not place tablets in bottom of the hole or touching the roots.
 4. Continue backfilling process. Water again after placing and tamping final layer of soil.
- G. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.06 MECHANIZED TREE SPADE PLANTING

- A. Trees may be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than the manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.
- B. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.
- C. Cut exposed roots cleanly during transplanting operations.
- D. Use the same tree spade to excavate the planting hole as was used to extract and transport the tree.
- E. Plant trees as shown on Drawings, following procedures in "Tree, Shrub, and Vine Planting" Article.
- F. Where possible, orient the tree in the same direction as in its original location.

3.07 TREE, SHRUB & VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin and shape trees, shrubs and vines as directed by Landscape Architect.
- C. Prune, thin and shape trees, shrubs and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

3.08 TREE STABILIZATION

- A. Install trunk stabilization as follows unless otherwise indicated:
 - 1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend to the dimension shown on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
 - 2. Use two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
 - 3. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Staking and Guying: Stake and guy trees more than 14 feet (4.2 m) in height and more than 3 inches (75 mm) in caliper unless otherwise indicated. Securely attach no fewer than three guys to stakes 30 inches (760 mm) long, driven to grade.
 - 1. Site-Fabricated Staking-and-Guying Method:
 - a. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
 - b. Support trees with strands of cable or multiple strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
 - c. Attach flags to each guy wire, 30 inches above finish grade.
 - d. Paint turnbuckles with luminescent white paint.
 - 2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.09 ROOT-BARRIER INSTALLATION

- A. Install root barrier where trees are planted within 60 inches of paving or other hardscape elements, such as walls, curbs, and walkways unless otherwise shown on Drawings.

- B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.
- C. Install root barrier continuously for a distance of 60 inches in each direction from the tree trunk, for a total distance of 10 feet per tree. If trees are spaced closer, use a single continuous piece of root barrier.
 - 1. Position top of root barrier flush with finish grade.
 - 2. Overlap root barrier a minimum of 12 inches at joints.
 - 3. Do not distort or bend root barrier during construction activities.
 - 4. Do not install root barrier surrounding the root ball of tree.

3.10 GROUND COVER & PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.
- E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.11 PLANTING AREA MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 12 inches and secure seams with galvanized pins.
- B. Mulch backfilled surfaces of planting areas and other areas indicated.
 - 1. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
 - 2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.12 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

- B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.13 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.
- C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.14 CLEANUP & PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.15 DISPOSAL

- A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 33 4000

STORM DRAINAGE SYSTEM

PART 2 - GENERAL

1.01 RELATED DOCUMENTS

- H. Drawings and general provisions of contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Site Storm Drainage System

1.03 REFERENCES

- A. All references shall be the latest adopted edition (except where edition date is specifically noted).
- B. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- C. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- E. ASTM F405 – Standard Specification for Corrugate Polyethylene (PE) Pipe and Fittings
- F. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- G. ASTM F667 – Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
- H. Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February, 2005.
- I. WSDOT Specification: Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation, the latest adopted edition. (Delete Measurement and Payment Provisions.)
- J. WSDOT Standard Plans for Road and Bridge and Municipal Construction, prepared by the Washington State Department of Transportation, latest revision issued prior to bid date.
- K. Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010.

1.04 SUBMITTALS

- A. Refer to Section 01 3300 for submittal procedures.

1.05 QUALITY ASSURANCE

- A. Maintain one set of WSDOT Specifications and project plans and specifications on site.
- B. Perform work in accordance with the Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February, 2005 and the Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Do not store plastic structures, pipe and fittings in direct sunlight and per manufacturer's recommendations.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle catch basins and other structures according to manufacturer's written instructions.

1.07 PROJECT CONDITIONS

- A. Field verify that the location and elevations of the storm drain system indicated on the Drawings accommodates the existing utilities, structures and conditions on the site; review and resolve any conflicts with Architect/Engineer prior to start of trenching.
- B. Locate, mark and protect existing utilities as specified in Section 02 1725 prior to start of trenching.

1.08 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
 - 1. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
 - 2. Contractor shall determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
 - 3. It is not the intent of the Contract Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 3 - PRODUCTS

2.01 PIPES AND FITTINGS

- A. PVC Pipe and Fittings: Conform to ASTM D3034 SDR 35 Type 1 with joints and gaskets conforming to ASTM D3212 and ASTM F477.
- B. Corrugated Polyethylene (PE) Pipe and Fittings: Conform to ASTM D405 and ASTM F667.

2.02 AGGREGATE

- A. Gravel Backfill for Drains: WSDOT 9-03.12(4)

2.03 ACCESSORIES

- A. Detectable Warning Tape: Refer to Section 31 2333.
- B. Joint Mortar: Portland cement based, fast setting, high strength, non-shrink grout.

2.04 DRAINAGE STRUCTURES

- A. Precast Concrete Catch Basins and Adjustment Sections: Conform to WSDOT Standard Plan B-5.20-01 for Type I catch basins and B-5.40-01 for Type 1L.
- B. Mortar and Grout: Mortar for finishing and sealing shall be Class "C". Honeycombing less than 2-inches deep shall be repaired using Class "D" mortar.
- C. Frames and Grates: Cast or ductile iron designed for heavy duty service, conforming to WSDOT Standard Plans shall be as follows unless otherwise specified on the Drawings, or required by local, state or federal code.
 - 1. Grates In Landscape Areas: Herringbone Grates (Plan B-30.50-01) unless otherwise specified on the Drawings.
 - 2. Frames:
 - a. For Type 1 and Type 1L Catch Basins: Per Standard Plan B-30.10-01.

PART 4 - EXECUTION

3.01 COORDINATION

- A. Review, coordinate and accommodate work of other Sections that interface with, affect or are affected by the work of this Section so as to facilitate the execution of the overall work of this project in a coordinated and efficient manner.
- B. Coordinate horizontal and vertical layout of storm drainage system to accommodate new and existing utilities, review conflicts with Architect/Engineer prior to start of trenching.

3.02 HORIZONTAL AND VERTICAL CONTROL

- A. Employ a Land Surveyor registered in the State of Washington to lay out and stake the Work and provide horizontal and vertical control; refer to Section 01 7000 for additional requirements
 - 1. Locate and protect survey control and reference points.
 - 2. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

- B. Lay out and stake utility lines prior to starting trenching.

3.03 PREPARATION

- A. Locate and mark existing utilities as required in Section 02 1725.
- B. Schedule shutdown of existing utilities affected by work of this Section with Owner as specified in Section 02 1725.

3.04 TRENCHING, BEDDING AND BACKFILL

- A. Refer to Section 32 2333 for excavation, trenching, bedding and backfilling.
- B. Conform to details shown on Drawings.

3.05 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. The location and arrangement of the piping layout shown takes design considerations into account. Install piping as indicated, to extent practical.
- 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.

3.06 PIPE INSTALLATION

- A. PVC and CPEP Storm Sewer Pipe and Fittings: Install in accordance with ASTM D2321, manufacturer's installation instructions.
- B. Lay pipe with uniform slope as shown on Drawings.
- C. Bed pipe for proper support as specified in Section 31 2333.
- D. Joint piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

3.07 IDENTIFICATION INSTALLATION

- A. Install continuous detectable warning tape during backfilling of trench for storm drain piping. Locate 12 inches below finished grade, directly over piping.

3.08 FIELD QUALITY CONTROL

- A. Contractor Quality Control: Employ/assign quality control personnel to monitor the work of this section for conformance to the requirements of this section and to good construction practices.

1. Contractor is solely responsible for managing and controlling the quality of the work and conformance with the requirements of the Contract Documents.
 2. Contractor shall rely on his own testing, experience and skill in determining what means and methods to employ to achieve the requirements of the Contract Documents.
- B. Clean interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
1. Place plug in end of incomplete piping at end of day and when work stops.
 2. Flush piping between catch basins and other structures to remove collected debris.
- C. Testing shall conform to WSDOT Specification 7-04.
1. 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 mandrel of size not less than 95 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 2. Replace defective piping using new materials and repeat inspections at the Contractor's expense until defects are within allowances specified.
 3. Reinspect and repeat procedure until results are satisfactory.

3.09 TESTING

- A. Test new systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects using low pressure air test in accordance with WSDOT Specification.
1. Do not enclose, cover, or put into service before inspection and approval.
 2. Test completed piping systems according to authorities having jurisdiction
 3. Schedule tests and inspections by authorities having jurisdiction with at least 48 hours advance notice.
 4. Submit separate reports for each test.
 5. Replace leaking piping using new materials and repeat testing at the Contractor's expense until leakage is within allowances specified.

3.10 PROTECTION AND CLEANING

- A. Protect new and existing storm drainage system from damage and from becoming full of dirt and debris during construction.
- B. At conclusion of project, remove all dirt and debris from catch basins, manholes, piping and storm drain structures; leave entire system in clean condition.

END OF SECTION

SECTION 33 4800

BIO-INFILTRATION SYSTEM

GENERAL

1.02 RELATED DOCUMENTS

- A. **Drawings and general provisions of contract, including Division 1 Specification Sections, apply to work of this Section.**

1.03 SECTION INCLUDES

- A. Bio-infiltration cells and swales for stormwater management.

1.04 REFERENCES

- A. All references shall be the latest adopted edition.
- B. ASTM D442 – Standard Test Method for Particle Size Analysis of Soils.
- C. ASTM D1557 – Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- D. City of Seattle (COS) Specification: Standard Specification for Road, Bridge and Municipal Construction, prepared by Seattle Public Utilities, the latest adopted edition. (Delete Measurement and Payment Provisions.)
- E. Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, dated February, 2005.
- F. Kitsap County Community Development *Kitsap County Stormwater Design Manual*, dated February, 2010.
- G. Kitsap Home Builders Foundation *Low Impact Development (LID) Guidance Manual*, dated June, 2009
- H. Test Methods for the Examination of Composting and Compost (TMECC)
- I. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation. (Delete Measurement and Payment Provisions.)
- J. WAC 173-350-100 Definitions
- K. WAC 173-350-220 Composting Facilities

1.05 SUBMITTALS

- A. At least 10 working days in advance of construction, the Contractor shall submit to the Engineer for review:
 - 1. A work plan and a schedule for the bio-infiltration cell and swale construction.
 - 2. Certificates and product data confirming that all products to be used will conform to specifications and drawings.
 - 3. Information required by COS Specification Section 7-21.3(1)A with the exception of the two five (5) gallon samples of the bioretention soil mix.
 - 4. Certificate from the bio-infiltration soil mix supplier confirming the ration of compost to aggregate and a description of the equipment and methods used to mix the mineral aggregate and compost.
 - 5. Certificate from compost supplier confirming that compost meets the contaminant standards identified in WAC 173-350-220.
 - 6. Certificate from compost supplier confirming that percent by volume of the feedstock inputs of the compost as identified in WAC 173-350-100.
 - 7. Provide the following information regarding the product supplier (s):
 - a. Name of supplier (s) including contact person (s),
 - b. Address (es)
 - c. Phone contact (s)

1.06 PROJECT CONDITIONS

- A. Field verify that the location and elevations of the storm drain system indicated on the Drawings accommodates the existing utilities, structures and conditions on the site; review and resolve any conflicts with Architect/Engineer prior to start of work.
- B. Some groundwater seepage out of cuts and in excavations should be expected on this site depending on time of year and weather. Provide sump holes, drainage trenches and pumps to collect, channel and remove this seepage water from the work areas and keep excavations free from standing water.
- C. Locate, mark and protect existing utilities prior to start of work.

1.07 SAFETY CONSIDERATIONS

- A. The Contractor is solely responsible for developing a safety plan to protect workers and the public from injury or harm conforming to all Local, State and Federal requirements and for executing and enforcing it on the Project site.
- B. Contractor shall consult with their own Geotechnical Engineering expert for determining soil classification relative to safe sloping of soils.
- C. Contractor shall determine safe excavation and dewatering methods, monitor excavations and earthwork operations for safety concerns and provide shoring and other protection as required to protect workers.
- D. It is not the intent of the Construction Documents to dictate any unsafe construction means or methods; Contractor shall determine means and methods of construction conforming to their safety plan as required to construct work shown on the Contract Documents.

PART 4 - PRODUCTS

2.01 BIO-INFILTRATION SOIL MIX

- A. Mix: The bio-infiltration soil mix shall be provided in accordance with COS Specification Section 9-14.1(3).

2.02 PLANTS

- A. Native or adapted grasses.

PART 5 - EXECUTION

3.01 PRE-INSTALLATION MEETING

- A. A pre-installation meeting shall be scheduled one week prior to the beginning of bio-infiltration cell and swale installation. Meeting attendees shall include the Owner, Engineer, general contractor, and any subcontractor that will construct any portion of the bio-infiltration cells and swales. Standards for bio-infiltration cells and swales finish and workmanship shall be determined and agreed upon by all parties in attendance.

3.02 COORDINATION

- A. Review, coordinate and accommodate work of other Sections that interface with, affect or are affected by the work of this Section so as to facilitate the execution of the overall Work of this project in a coordinated and efficient manner.
- B. Bio-infiltration cell and swale construction shall not begin until the site area draining to the bio-infiltration facility has been fully stabilized.

3.03 PREPARATION

- A. Locate and mark existing utilities.
- B. Schedule shutdown of existing utilities affected by work of this Section with Owner as specified in Section 02 1725.

3.04 EXCAVATION

- A. Bio-infiltration cell and swale excavation shall not be performed during wet or saturated soil conditions.
- B. Excavation should be performed as much as possible by equipment working adjacent to the bio-infiltration cells and swales. If equipment must operate within the bio-infiltration cells or swales, only light weight, low ground-contact pressure equipment should be used and the base should be scarified at the completion of excavation.
- C. Scarify native soil within bio-infiltration cells and swales a minimum of 2 inches deep where slopes allow, prior to placing bio-infiltration soil.
- D. Notify Engineer a minimum of 48 hours prior to installation of bio-infiltration cells and swales.

3.05 CONTROL OF WATER

- A. Prevent surface water from entering excavations; prevent water from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.06 SOIL INSTALLATION

- A. Soil mixing and placement shall not be performed if the soil is saturated or within 48-hours of a storm event that produces 1/2 inch of precipitation.
- B. Bio-infiltration soil should be placed as much as possible by equipment working adjacent to the bio-infiltration cells and swales. If equipment must operate within the bio-infiltration cell or swale, only light weight, low ground-contact pressure equipment should be used.
- C. Bio-infiltration soil shall be placed in lifts not exceed 12 inches deep and compacted to a relative compaction of 85 percent per ASTM D1557.
- D. Plant grasses on the sides and bottom of the cells and swales.

3.07 PROTECTION

- A. Bio-infiltration cells and swales shall not be used for sediment control during construction; all drainage should be directed away from the cell after initial rough grading.

END OF SECTION