



Clean Water Services

**SECOND ADDENDUM TO INVITATION TO BID
FOR THE ROCK CREEK PRIMARY CLARIFIER NO. 4 PROJECT NO. 7012
CLEAN WATER SERVICES**

ISSUED: MARCH 24, 2023

Clean Water Services' Invitation to Bid for Invitation to Bid - Rock Creek Primary Clarifier No. 4 Project No. 7012 dated February 20, 2023 (ITB) is hereby amended as follows:

1. **Change:** Specification Addition: Add the following Specifications in the Contract Documents:
 - a. 02825 ORNAMENTAL STEEL FENCES AND GATES
2. **Change:** Specification Replacement: Replace the following Specifications in the Contract Documents with those included in this Addendum as follows:
 - a. 01140 WORK RESTRICTIONS
 - b. 02915 SOIL PREPARATION
3. **Change:** Drawing Replacement: replace the following Drawings in the Contract Documents with those included in this Addendum as follows:
 - a. G002, C003, C006, C011, C012, C014, C016, C018, C021, C022, C023, C024, C025, C026, C027, C028, C031, C034, C041, C042, C043, C044, C071, L01, L03, L06, S008, M313, I013.

The reissued drawings largely represent modifications associated with the addition of two new RV dump stations and a new access roadway that provides access to the stations. These changes also include modifications to the final grading plan. A third addendum will be issued for the electrical and instrumentation changes associated with the new roadway loop, the RV dump stations, and new site lighting.
4. **Change:** Specification Table of Contents
 - a. Add Specification Section 02825 Ornamental Steel Fences and Gates
5. **Change:** Specification Section 00800 Supplementary
 - a. Add Part SC-5.06.A.1 as follows:

“SC-5.06.A.1 – Add the following language after Paragraph 5.06.A.1:

a. Report dated March 2023 prepared by Creekside Environmental Consulting, LLC, 40 SE 24th Avenue, Suite A, Portland, OR 97214 entitled Focused Asbestos and Hazardous Materials Survey consisting of 76 pages. The Technical Data contained in such report upon whose accuracy Contractor may rely on are those indicated in the definition of Technical Data in the General Conditions.”

6. **Change:** Specification Section 02300 Earthwork

- a. Delete Part 2.04 A. and replace with the following: “Shall conform to the requirements of Topsoil as specified in Section 02915, Soil Preparation”
- b. Delete Part 2.05 A. and replace with the following: “Shall conform to the requirements of Topsoil as specified in Section 02915, Soil Preparation”

7. **Change:** Specification Section 02820 Fences and Gates

- a. Delete Part 2.03, Part 3.06, and Part 3.08 B.

These sections were moved into Section 02825 Ornamental Fences and Gates. The electric operator is to be provided with the Ornamental entry gate, not the chain link fence sections.

8. **Change:** Specification Section 03600 Grouts

- a. Delete Part 3.06 C.

9. **Change:** Specification Section 05100 Structural Metal Framing

- a. Delete Part 1.03. D. 4.

10. **Change:** Specification Section 15050: Piping Valves and Accessories

- a. Section 2.03 T.5. Regarding design pressure to be used for fitting design, change the last sentence of the paragraph to read as follows: “Use 50 psi for the design pressure P.”
- b. Section 2.06 D.1.k Pressure Reducing Valves. Add part 3) as follows:
 - 3) For Recycled Water: flanged ends, hydraulic, pilot controlled, globe style valves. The valve shall reduce higher inlet pressure to a steady lower downstream pressure, regardless of changing flow rate and/or varying inlet pressure. The valve shall also include a check valve feature that will prevent return flow during a pressure reversal occurrence. Valves shall be of a single manufacturer: Cla-Val; Singer; or equal.
 - a. Size: 3-inch, reduced port
 - b. Configuration: In-line
 - c. Pressure Rating: 175 psi minimum

- d. Operating Range: 50 psi to 100 psi outlet pressure
- e. Flow Range: 0-100 gpm.
- f. Connections: Flanged, 125 lb
- g. Materials: Iron body with fusion epoxy lining trim, Buna-N elastomers.

11. Change: Drawing G005 PIPING SCHEDULE, SYMBOLS AND REFERENCING

- a. Replace “A” with “W” under Test Medium for the Recycled Water (RW) BS40 System.

Testing medium should be water, not air.

12. Change: Drawing C042 Civil Yard Piping Plan 2

- a. Replace Sheet Keynotes #6 with the following:
 - i. Keynote #6. “PIPES SHALL BE DUCTILE IRON AND SHALL MEET PIPE REQUIREMENTS ON G005.”

13. Change: Drawing S301 Primary Clarifier Bottom Plan:

- a. In reference to the slab construction joint callout; change the callout to read “SLAB CONSTRUCTION JOINT (TYP), SEE DETAIL S-3112”

14. Change: Drawing S313 Primary Clarifier Gallery Sections 1:

- b. Pipe encasements shown below the pump gallery slab; Elevation callout shown as “EL 147.50” shall be changed to “EL 142.50”

15. Change: Drawing M303 Mechanical Primary Clarifier No. 4 Top Plan:

- c. Replace Sheet Keynotes # 1, #6, and #10 entirely and replace with the following:
 - i. Keynote #1. “CLEAR HATCH OPENING 4’ BY 6’. HATCH BY CLARIFIER COVER MANUFACTURER.”
 - ii. Keynote #6. “EFFLUENT BOX COVER AND ACCESS HATCH BY CLARIFIER COVER MANUFACTURER.”
 - iii. Keynote #10. “WET WELL COVER AND ACCESS HATCH BY CLARIFIER COVER MANUFACTURER. HATCH CLEAR OPENING TO BE 2’-6” BY 3’-0”. REMOVABLE RAILING 3 SIDES. GAP BETWEEN REMOVABLE RAILING AND FIXED EXTERIOR RAILING TO BE 4 INCHES MAXIMUM”

Clarifications, which do not modify the Contract Documents, are as follows:

1. **Clarification:** full size Contract Drawings are available at the following link:

<https://www.dropbox.com/s/dvyrndu0tIglbop/Scanned%20Drawing%20Set%20-%202014%20February%202023.pdf?dl=0>

2. **Clarification:** Focused Asbestos and Hazardous Materials Survey has been included for reference.
3. **Clarification:** Record drawings of existing infrastructure have been included for reference.

SECTION 01140

WORK RESTRICTIONS

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. Work shall be scheduled, sequenced, and performed in a manner which minimizes disruption to the public and the operation and maintenance of existing facilities.
- B. The Contractor shall incorporate the construction and schedule constraints of this Section in preparing the construction schedules required under Section 01324, Construction Schedule.

1.02 EXISTING TREATMENT PLANT

- A. The Work shall be executed while all existing wastewater treatment facilities and pump stations are in operation.
- B. Operation of the existing facility shall not be jeopardized nor shall the efficiency or volume of wastewater conveyance be reduced as a result of the execution of the Work. Impairing the operational capabilities of the treatment plant will result in serious environmental damage and monetary fines.
- C. Conduct Work in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to treat the quality of wastewater to the water quality limitations specified in the discharge permit. The status of the treatment plant shall be defined as “operational” when it is capable of treating the entire quantity of wastewater received to the water quality limits specified in the discharge permit.
- D. The construction sequence and constraints in this Section do not include all items affecting the completion of the Work, but are intended to describe the sequence of critical events and associated constraints necessary to minimize disruption to the ongoing treatment plant processes and to ensure compliance with NPDES Permit requirements and prevent all overflows within the collection system.
- E. The Work Restrictions described are not all inclusive and that additional items of Work not included or described may be required to minimize disruption and ensure operational compliance. Deviation from or modification of these suggested sequences is permitted if techniques and methods known to the Contractor will result in reducing disruption to the facility operation and maintaining treatment efficiency, avoiding violation of scheduling constraints, and if deviation is approved in advance by the Engineer and Owner’s Representative.

1.03 OPERATION OF PLANT EQUIPMENT

- A. Operational functions, deactivations, or shutdown of existing treatment plant processes or equipment required to facilitate Contractor’s Work will be done by the Owner’s personnel only.
- B. The plant operation and maintenance personnel will cooperate as is practical in order to facilitate Contractor’s Work. However, certain shutdown and connections may only be permissible at times other than normal working hours such as nights

or weekends. No additional payment will be made to the Contractor for any night, weekend, or holiday premium or overtime payments.

- C. If it becomes necessary for the proper operation or maintenance of portions of the plant, the Owner may require the Contractor to reschedule an approved shutdown. If notice of said rescheduling is given to the Contractor at least 24 hours in advance of the scheduled shutdown, the Contractor shall not be entitled to additional compensation due to the impacts of rescheduling. The Contractor shall then reschedule its Work so there shall be no conflict with necessary operations or maintenance of the plant. The Contractor shall, within 2 working days, furnish the Owner's Representative a revised Deactivation Request and a plan for rescheduling the shutdown in accordance with the requirements of the construction schedule.

1.04 DEACTIVATION REQUESTS

- A. The Contractor shall not remove from service, operate any equipment, tie-in, de-energize, and or modify operational settings for any facility without permission from the Owner's Project Representative.
- B. Modifications to existing facilities, the construction of new facilities, and the connection of new to existing facilities may require the temporary outage or bypass of existing treatment processes or facilities. In such cases, the Contractor shall coordinate Work with the Owner's Representative as described below. The Contractor shall submit a detailed Deactivation Plan and time schedule for all Work activities to accomplish modification.
- C. Deactivation Plans shall be submitted to the Owner's Representative for approval a minimum of 14 days in advance of the time that such deactivations are required. The Deactivation Plan shall be coordinated with the construction schedule and shall meet the Work Restrictions. The Deactivation Plan shall describe the Contractor's method of bypassing any deactivated unit and for preventing bypassing of other treatment units; the length of time required to complete the operation; any necessary temporary power, controls, instrumentation, or alarms required to maintain control, monitoring, and alarms for the associated facilities; and the manpower, plant, and equipment which the Contractor shall provide in order to ensure proper operation of associated treatment units. All costs for preparing and implementing the Deactivation Plans shall be the responsibility of the Contractor as part of the Work.
- D. The Contractor shall not begin an alteration affecting existing facilities until specific written approval has been granted by the Owner's Representative in each case.
- E. The Owner's Representative will coordinate the Contractor's planned procedure with Owner personnel. The Owner's Representative have the authority to modify any proposed shutdown procedures if such procedures would adversely impact the plant operations.
- F. The Owner's Representative shall be notified in writing a minimum of 7 days in advance of the required deactivation if the schedule for performing the Work has changed or if revisions to the Deactivation Plan are required. The Contractor shall provide written confirmation of the deactivation date and time 2 days (48 hours) prior to the actual deactivation. This notification shall also provide confirmation that the Contractor has all the required parts, materials, tools, and equipment on-hand to successfully undertake and complete the deactivation.

1.05 BYPASS FACILITIES

- A. Bypassing of untreated or partially treated sewage to surface waters or drainage courses is strictly prohibited during construction. In the event accidental bypassing is caused by the Contractor's operations, the Owner shall immediately be entitled to employ others to stop the bypassing and costs incurred there from, including any regulatory agency fines resulting there from, will be deducted from the Contractor's construction progress payments. If accidental bypass occurs, the Contractor shall immediately inform the Owner's Representative.
- B. Install and maintain bypass facilities, including pumping, and temporary components required to keep facility operations online. See Section 02070 for additional requirements.
- C. Bypass pumping control must mimic typical plant flow and must be capable of evenly splitting flow and controlling flow rate based on process requirements.
- D. Bypass pumping redundancy, installed or standby, must be provided and approved by Engineer and Owner prior to use.
- E. Conditions that require bypass facilities include, but are not limited to:
 - 1. Work sequencing activities required to complete Project.
 - 2. Failure to meet Work Constraints identified herein.
 - 3. Inclement weather during temporary shutdowns that require increased treatment or containment capacity.

1.06 TEMPORARY CONNECTIONS

- A. The making of connections to existing facilities or other operations that interfere with the operation of the existing equipment or process flow paths shall be thoroughly planned in advance, and all required equipment, materials, and labor shall be on hand at the time of undertaking the connections. Work shall be completed as quickly as possible and with as little delay as possible, and shall proceed continuously (24 hours a day and 7 days a week) if necessary to complete modifications and/or connections in the minimum time.
- B. The cost of any temporary facilities and night, weekend, or holiday work and overtime payments required during process interruptions shall be included in the price of the Work.
- C. Temporary facilities and piping shall be provided to minimize interference by Contractor with Owner's operation and maintenance of the wastewater treatment plant. Unless otherwise indicated, each temporary pipeline (including sample lines) shall be of the same size as its connection to the existing or permanent facility at the downstream end of the pipeline. Piping materials shall be suitable for the material being conveyed and be as required in the Contract Specifications. Temporary bulkheads necessary to isolate wetted process areas to perform Work shall be designed and stamped by an engineer registered in the State of Oregon.
- D. When temporary electrical power, controls, instrumentation, or alarms are required for routine continuous operations of existing or new equipment, the Contractor shall provide the necessary equipment and appurtenances. Prior to installing said equipment and appurtenances, Contractor shall furnish a submittal on the proposed components and installation for Engineer's review and approval.
- E. A plan showing the size and location of the temporary facilities and piping shall be submitted to the Engineer and Owner's Representative at the same time as the

Deactivation Plan required under this Section. All costs for design, provision, operation, and removal of temporary facilities and piping shall be the responsibility of the Contractor.

1.07 SCHEDULE CONSTRAINTS

- A. General: It is the Contractor's responsibility to coordinate and plan the construction activities to integrate each schedule constraint into performance of the overall Work. The constraints identified herein are general descriptions of the major activities requiring sequencing or interface with the existing plant operation. It is not the intent of this Section to list all sequences, constraints, or coordination items required for the Work. Coordination of the detailed Work constraints within Specification Sections is required.
- B. Contractor shall review the requirements for start-up and testing in Section 01756 Testing and Facility Startup.
- C. Process, Facility, or Service Shutdown:
 - 1. All diversions and shutdowns to plant flows and processes shall be subject to the requirements for a deactivation request and actual process, flow, and weather conditions existing at the time of the requested deactivation. Owner's determination regarding the acceptability of proceeding with a planned diversion or shutdown shall be final.
 - 2. Contractor shall work continuously during diversions and shutdowns (1) if necessary, (2) when specified, or (3) when requested by Owner and Engineer to complete the work within the time allotted.
- D. Work Constraints:
 - 1. The submitted Work Sequence Plan shall incorporate the following general Work Constraints regarding treatment plant operations:
 - a. Contractor must maintain unimpeded access to WWTP roads at all hours. This includes access to all buildings by all people, including the public, employees, and contractors who use the site.
 - b. Contractor shall maintain or provide site security at all times throughout the duration of the Work. The site security shall provide at a minimum, the equivalent security measures provided in the preconstruction conditions.
 - c. Design and provide all temporary piping and support systems as required to protect and maintain existing piping in service. Coordinate temporary piping and support systems with the requirements of this Section.
 - 2. The submitted Work Sequence Plan shall incorporate the follow Work Constraints regarding treatment process and operations:
 - a. Typically all three primary clarifiers are online during wet season flows and two primary clarifiers are online during dry season flows. Two primary clarifiers must be in operation at all times. The only exception is for the demolition and capping of the 84" line from the old rectangular clarifiers to the Primary Interceptor Box. Demolition of the Primary Interceptor Box must be completed after commissioning of Primary Clarifier 4 and with influent plant flows less than 50 MGD. During the Primary Interceptor Box demolition, all plant flow shall be directed through Primary Clarifier 4. This will allow the west side of the Primary Effluent piping system to be isolated to allow demolition of the structure.

- b. All primary clarifiers must be in operation before June 1 and after October 14.
 - c. Only one alum pump may be out of service at any time. Work on the out of service pump(s) shall not interfere with operation of the remaining pumps.
 - d. Alum addition to headworks must be maintained at all times and temporary piping for alum addition may be required.
 - e. Sodium Hydroxide, Sodium Hypochlorite, and Alum and High Pressure Air piping may not be shut down for more than 8 hrs.
 - f. Plant Water may not be shut down for more than 2 hrs.
 - g. The Solids Processing Return (SPR) piping can only be offline for a maximum period of 4 hours.
 - h. Temporary shut down of the Primary Effluent system, including the Nevada Box and all piping between the primary clarifiers and the primary effluent pump stations shall not exceed 48 hours continuously.
 - i. With the exception of short-duration planned shutdowns, continuous odor control shall be provided to all online clarifiers and systems.
 - j. The connected odor control air flow rate shall not be increased by more than 3,000 cfm in any week period.
3. Water from dewatering operations shall be directed to the onsite sanitary sewer system. The water shall meet a 400 mg/L TSS limit or be treated by Contractor to meet the limit. Verification of discharge locations shall be coordinated with the Owner's Representative.
 4. The Work will include connection to and working around facilities containing sewage, sludge, and hydrogen sulfide gas and other sewage gasses. The Contractor shall establish and abide by its Safety Plan including observing confined space testing, entry and work procedures at all times. The Contractor shall also review and include pertinent provisions of the Owner's treatment plant safety plan in its own Safety Plan with regard to working around chemicals and other conditions present at wastewater treatment plants.
 5. The Contractor shall limit its work activities and traffic to the area of the Project Work and shall not enter any other plant areas without prior written permission from the Owner. The Contractor shall strictly obey all speed limits and other traffic laws at all times.

1.08 CONSTRUCTION SEQUENCING

A. WORK SEQUENCE PLAN

1. Using Work Constraints identified herein, the Contractor shall develop an independent Work Sequence Plan and is not necessarily obligated to follow the work sequencing described herein. The Work Sequence Plan shall include:
 - a. Description and sequence of major construction activities that affect plant operations.
 - b. Explanation of how Work Constraints and Milestones will be met.
 - c. Coordination with Facility Startup, Training and Testing and Construction Schedule.

- B. All construction activities shall be scheduled and sequenced to ensure continuous operation of the existing conveyance and treatment facilities. The Contractor's scheduling shall develop all construction sequencing so that the Work will not adversely impact conveyance or treatment. The Contractor shall be responsible for

development of the construction sequencing. In implementing the construction sequencing, the Contractor shall maintain the existing facilities in service until new facilities are constructed and are operational to supplement the existing capacity. When new facilities are operational (as defined in Section 01756, Testing, Training, and Facility Startup, and Section 01770, Closeout Procedures) and accepted by the Owner, the existing facilities may be taken out of service upon approval by the Engineer and Owner's Representative.

- C. The following general guidelines shall be used by the Contractor in planning the sequence of construction.
1. During all modification and demolition work, safe working conditions for personnel shall be maintained at all times. The foregoing includes at least proper trench excavation, the provision of temporary equipment guards, supports, warning signs, walkways, covers over openings, handrailing, lighting, traffic control measures, and protection of electrical equipment and power supply.
 2. All temporary facilities shall be constructed in accordance with applicable codes and regulations to operate safely and properly.
 3. Valves to be temporarily shut off during the Work shall be coordinated with the Owner's Representative, tagged as such and shall be wired shut with a crimped lead seal and padlocked for safety in accordance with the Contractor's Safety Plan and in a manner acceptable to the Owner.
 4. Electrical and mechanical equipment to be temporarily shut off during the Work shall be locked out and tagged for safety in accordance with the Contractor's Safety Plan and in a manner acceptable to the Owner.
 5. All in-road work shall be planned with a traffic control plan that will be reviewed and approved prior to start of work.
 6. Owner will take existing rectangular primary clarifiers out of service after which Contractor shall take responsibility for the facility. Contractor should anticipate 5 working days for taking each tank offline. Contractor should expect to dispose of up to 40 cubic yards from each of the primary clarifiers. Liquids may be pumped to on site sewer. Debris may be disposed of in Owner's dumpster located in the headworks.
 7. Owner will take existing headworks and Septage receiving buildings offline. Contractor should anticipate 5 days for taking these facilities offline. All existing equipment, piping, electrical, instrumentation, and other materials within these buildings require disposal by the Contractor.
- D. Suggested Sequencing of Major Activities: This Section provides a suggested sequence for major construction activities that incorporates the Work Constraints and Milestones specified. Additional and parallel activities will be required. The Contractor may utilize all or part of this suggested sequence in the submitted Work Sequence Plan to meet the required Work Constraints and Milestones. The Work Sequence Plan must provide an equivalent level of reliability, flexibility, and operating characteristics with respect to plant operations and meeting plant discharge permit requirements. The Contract Times, Liquidated Damages, and Contract Milestones are based, in part, on the suggested sequencing described herein. The Owner reserves the right to modify the Contract Times, Liquidated Damages, and Contract Milestones based on Contractor-initiated changes to the suggested sequencing at no additional cost to the Owner.
1. Procure all long lead equipment items.
 2. Demolition and Temporary Rerouting of existing utilities:
 - a. Provide temporary piping to SPR and BWR systems.

- b. Confirm permanent rerouting of natural gas piping has been completed by NW Natural.
 - c. Protect existing utilities in place, including sanitary sewer force mains on the north side of Primary Clarifier No. 4.
 - d. Isolate the existing rectangular clarifier from the primary effluent channel by installing a temporary wall downstream of the existing Parshall flume. Maintain the isolation until the new clarifier is online.
 - e. Demo existing rectangular primary clarifiers and old headworks and existing piping and utilities shown for demolition within the footprint of the new work.
 - f. Install temporary RV Dump station including excavation fill, and roadway repairs per Detail 1/C012. While the existing RV station is offline and the temporary station is installed, the public will have access to a secondary RV dump station located immediately south of the Engineering Building. Contractor to note that the construction access between the Contractor's staging area and the site will be shared access with the public using the secondary RV facility.
 - g. Excavate and shore for new primary clarifier
 - h. Install deep pile foundations
 - i. Install underground piping at primary clarifier and make connections to existing piping under existing utility corridor.
 - j. Restore SPR and BWR flows into the existing piping at the new tunnel location. Following connection, remove temporary SPR and BWR piping system.
 - k. Construct primary clarifier and pipe utility tunnel.
 - l. Rough grading to final grade conditions within excavated areas
 - m. Install process mechanical systems within the pump gallery and utility tunnel.
 - n. Connect new process piping into existing systems
 - o. Startup and testing of the new primary clarifier No. 4 including all ancillary systems.
 - p. With the new clarifier online, remove the temporary wall at the rectangular clarifier connection, remove the remaining rectangular clarifier effluent channel, and remove the existing 84" pipe connection at the existing Primary Interceptor Box.
 - q. Install final grading, paving, and site cleanup at clarifier.
 - r. Install new site entrance roadway, new RV Dump stations, parking lot improvements, and connection into existing plant access. Coordinate the installation of the new access roadways with the demolition of the existing access way to maintain uninterrupted access into the plant.
 - s. Remove any remaining temporary systems.
3. Septage receiving station
- a. Maintain operations of existing septage receiving station
 - b. Construct new septage receiving station including necessary process piping connections and electrical and instrumentation connections into existing systems.
 - c. Septage receiving station startup and testing
 - d. Demolish existing septage receiving station.
4. Entry roadway improvements
- a. Maintain access to site and the existing main parking lot by the engineering building.

- b. Following construction of Primary Clarifier No. 4 and rough grading to final subgrade elevations, demolish parking lot west of the existing entrance.
 - c. Construct new access roadway.
 - d. Install new site fencing, landscape, and signage.
 - e. Open new entry way to plant access.
 - f. Demolish existing entry way and existing Administration building parking lot
 - g. Construct new parking lot and access way improvements.
 - h. Complete all remaining site work, including fencing, landscaping, site security cameras, and entry way signage.
- E. The Contractor shall use the Interim Milestones for substantial and final completion as defined below and in the Contract Documents in developing its construction plan and baseline CPM schedule. These Interim Milestones are not all-inclusive; the Contractor shall develop and include additional construction sequencing measures as necessary to maintain operation of existing facilities and to complete the Work within the Contract time.
- 1. Interim Milestones:
 - a. SPR and BWR temporary connections: Contractor shall complete temporary piping installation between June 1 and August 1, including:
 - 1) Connection into existing SPR and BWR piping
 - 2) Installation and testing of bypass piping systems to allow the SPR and BWR piping sections within the excavation limits to be demolished, as shown on the Drawings.
 - 3) Restoring SPR and BWR flows within the temporary piping.
 - 2. Substantial Completion: Substantial Completion shall be the point in time when the Primary Clarifier No. 4 is receiving and treating primary influent flows; new mechanical equipment within the pump gallery are operational, the new alum pump is online and operating, the septage receiving station is installed and operational, the new site entrance and parking lot is constructed and usable for public, employee, and contractor use and all Operational Readiness testing has been completed and Accepted by the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 02825

ORNAMENTAL STEEL FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Ornamental steel fences.
 2. Ornamental steel sliding and swinging gates.
 3. Electric gate operators and controls and related hardware.
 4. Factory painting and field touchup painting.
 5. Concrete foundations.

1.02 REFERENCES

- A. American Society for Testing Materials (ASTM):
1. A 36 Standard Specification for Carbon Structural Steel
 2. A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 3. A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 4. A 513 Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
 5. A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip
 6. B 26 Standard Specification for Aluminum-Alloy Sand Castings
- B. American Welding Society (AWS):
1. AWS B2.1 Specification for Welding Procedure and Performance Qualification
- C. International Code Council (ICC):
2. ICC-ES: Evaluation Reports
 3. 2022 Oregon Structural Specialty Code (OSSC).

1.03 SUBMITTALS.

- A. Product Data: Fully describe all products proposed for use.
- B. Shop Drawings: Show the specific items and assemblies proposed for this project.
- C. Operation and Maintenance Manual for electric gate operators.

1.04 QUALITY ASSURANCE

- A. Contractor's Qualifications: Welding procedures, welders, and welding operations shall be qualified for the type of work required in accordance with AWS Standard Qualification Procedures.
- B. Comply with requirements of local Fire Marshal Fire and Prevention Department having jurisdiction for emergency operation of gated entry points.
- C. Comply with applicable provisions in the OSSC, adopted edition and the National Electrical Code.

- D. All work shall be in strict conformance with manufacturer's printed instructions and recommendations.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in good condition and properly protected against damage to factory-finished surfaces.
- B. Store materials in a clean, dry location. Cover with protective materials to avoid damage, especially from dust, chemicals and moisture in the air.
- C. Handle materials carefully on the job site to protect factory finishes.

PART 2 - PRODUCTS

2.01 ORNAMENTAL STEEL FENCES

- A. Provide a minimum three rail, fully welded, heavy industrial grade, galvanized steel, factory painted, ornamental wrought iron picket fence with sliding and swinging gates system: Builders Fence Company, Inc.; Amazing Gates; Iron Fence Shop; or equal.
- B. Material:
 - 1. Pickets, rails, and posts shall be manufactured from tubing meeting the requirements of ASTM A 513 or A 500 Grade B.
 - 2. Solid steel bars, flat plates and shapes shall be manufactured from steel conforming to the requirements of ASTM A 36.
 - 3. Pickets for gates shall be of the same size and style as those in the fence panels. Frames for fences and gates shall be of sufficient size and thickness to provide adequate support without sag. Adjustable trussing may be required at gates. Gate hardware shall be supplied by the manufacturer and shall be of sufficient size and capacity to support the gate specified.

2.02 FABRICATION

- A. Steel used in the manufacturing of panels, gates and posts shall conform to the ASTM standards specified and shall be new prime material.
- B. Panels, gates and flanged posts shall be of welded construction. No wire rods, screws or rivets shall be accepted to attach pickets to rails. Layout and welding shall be done by experienced craftsmen. Welds shall be made by the gas metal arc method and welds shall be neat, clean and of the sizes indicated on the shop drawings. All flush welds shall be ground smooth.
- C. After fabrication, steel panels, gates and posts shall be power washed in a phosphoric acid solution, rinsed and dried.
- D. Fence Components:
 - 1. Steel post sizes, maximum spacing and minimum foundation size. Provide barrier coating at dissimilar materials:

Height	Rails	Max. Spacing	Min. Square Tube Posts	Min. Concrete Foundations
6 feet	3	8 feet	3" x 12 gauge	12" dia. x 36" deep
7 feet	4	8 feet	3" x 11 gauge	15" dia. x 42" deep
8 feet	4	6 feet	4" x 10 gauge	18" dia. x 48" deep

2. Gate posts and foundations: Minimum 4-inch x 10-gauge post and an 18-inch-diameter x 48-inch-deep concrete foundation.
 3. Tube or "U" channel rails:
 - a. 2-inch x 1-1/2-inch x 0.120-inch-thick (11-gauge) "U" channels
 - b. 2-inch x 2-inch x 0.120-inch-thick (11-gauge) tube.
 4. Steel tube pickets:
 - a. 1-inch x 1-inch x 16-gauge steel spaced 6 inches o.c.
 - b. Each picket to be capped with fleur de lis-style pointed top. Color to match pickets. Provide barrier coating at dissimilar materials.
 - c. Provide matching "puppy panels". Place between full-size pickets. Provide matching picket tops.
 5. Fence post tops:
 - a. Zinc alloy die cast ball. Color to match pickets. Provide barrier coating at dissimilar materials.
- E. Fabrication:
1. Factory cut all material. Punch rails for pickets. Assemble fence panels in longest sections that can be transported. Weld all joints. Provide "U" shaped slip joints for field assembly by welding or by using stainless steel 1/4-inch-diameter bolts or 1/4-inch-diameter stainless steel industrial rivets.
- F. Finish:
1. All steel material shall be hot-dip galvanized G-90.
 2. Rinse and clean.
 3. Steel material to be phosphate etch, rinse clean and oven dry.
 4. Steel First Coat: Powder coat with zinc-rich epoxy primer.
 5. Steel Second Coat: Polyester powder coat, 3.5 mils average dry film thickness and bake at 450°F.

2.03 STEEL GATE, CANTILEVER SLIDING

- A. Provide an electrical motor-operated steel cantilever slide gate. Builders Fence Company, Inc.; Amazing Gates; Iron Fence Shop; or equal.

Use member sizes described herein unless heavier members are shown or required.

1. Gate frames shall be made of 3-inch x 3-inch x 0.125-inch steel tube welded at all corners so as to form a rigid one-piece unit.
2. Steel tube or "U" channel rails:
 - a. a. 2-inch x 1-1/2-inch x 0.120-inch-thick (11-gauge) "U" channels.
 - b. b. 2-inch x 2-inch x 0.120-inch-thick (11-gauge) tube.
3. Steel tube pickets:
 - a. 1-inch x 1-inch x 6-gauge steel spaced 6 inches o.c.
 - b. Each picket to be capped with fleur de lis-style pointed top. Color to match pickets. Provide barrier coating at dissimilar materials.
 - c. Provide matching "puppy panels". Place between full-size pickets. Provide matching picket tops.
4. Internal uprights in the gate frames shall be 1-inch x 2-inch steel rectangular tubes welded to the frame a maximum of 6-inch o.c.
5. All gate frames shall have an adjustable 3/8" galvanized truss rod in each panel.
6. For gate leaf sizes over 23' 0", one additional 2" square lateral support rail shall be welded adjacent to top horizontal rail. The bottom rail will be 2" x 4" tubing weighing minimum 1.71 pounds per foot.

7. The enclosed track shall be a combined one-piece track and rail aluminum extrusion having a total weight of 3.72 pounds per foot and designed to withstand a reaction load of 2,000 pounds.
 8. Two swivel type zinc die cast trucks having four sealed lubricant ball-bearing wheels, 2 inches in diameter by 9/16 inches in width, with two side rolling wheels to insure alignment of truck in track shall be provided for each gate leaf. Trucks shall be held to post brackets by 7/8-inch-diameter ball bolts with 1/2 inch shank. Truck assembly shall be designed to take the same reaction load as the track.
 9. All steel gate hangers, latches, brackets, guide assemblies and stops shall be galvanized after fabrication malleable iron or steel. Latching devices shall comply with 2.01.
 10. Gates shall be installed on concrete posts. Provide barrier coating at dissimilar materials.
 11. Guide wheel assemblies shall be provided for each supporting post. Each assembly shall consist of two rubber wheels 4 inches in diameter and shall be attached to post so that the bottom horizontal member will roll between the wheels that can be adjusted to maintain plumb gate frames and proper alignment.
 12. Gates shall have electric motor operators.
 13. Gates shall have finish to match the fence.
- B. Finish:
1. All steel material shall be hot-dip galvanized G-90.
 2. Rinse and clean.
 3. Steel material to be phosphate etch, rinse clean and oven dry.
 4. Steel First Coat: Powder coat with zinc-rich epoxy primer.
 5. Steel Second Coat: Polyester powder coat, 3.5 mils average dry film thickness and bake at 450°F.
- C. Gate Hardware: Sliding gate hardware, top guide rollers and bottom rollers shall be Richards-Wilcox; Stanley; or equal.
- D. Electric Gate Operator:
1. Automatic Gate Operator: Gate opener shall be capable of moving a 36-foot minimum gate length with a weight of 4,000 lbs. The operator shall include and control a continuous duty motor and move gate at a minimum speed of 12-inches per second. Operation shall be by means of a metal rail passing between a pair of reinforced composite wheels with polyurethane treads. Operator motors shall be hydraulic, geroller type, and system shall not include belts, gears, pulleys, roller chains or sprockets to transfer power from operator to gate panel. The operator shall generate a minimum horizontal pull of 300 lb (136 kg) without the drive wheels slipping and without distortion of supporting arms. Unit shall meet UL 325 and UL 991, minimum motor size is 1/2 hp at 120VAC. Manufactured by Hysecurity model SlideDriver 40 (222 E ST), or equal.
 - a. Minimum standard mechanical components:
 - 1) Supporting arms: Cast aluminum channel. Arms shall incorporate a fully bushed, 1 1/2" (38 mm) bronze bearing surface, acting on arm pivot pins. (item 2 below)
 - 2) Arm pivot pins: 3/4" (19 mm) diameter, stainless steel, with integral tabs for ease of removal.
 - 3) Tension spring: 2 1/2" (63 mm) heavy duty, 800 lb (363 kg) capacity.

- 4) Tension adjustment: Finger tightened nut, not requiring the use of tools.
 - 5) Drive release: Must instantly release tension on both drive wheels and disengage them from contact with drive rail in a single motion, for manual operation.
 - 6) Limit switches: Fully adjustable, toggle types, with plug connection to control panel.
 - 7) Chassis: 1/4" (6 mm) steel base plate, and 12 Ga. (3 mm) sides and back welded and ground smooth.
 - 8) Cover: 16 Ga. (1 mm) zinc plated steel with textured TGIC polyester powder coat finish. All joints welded, filled and ground smooth. Finished corners square and true with no visible joints.
 - 9) Finish: Zinc plated steel with textured TGIC polyester powder coat finish, proven to withstand 1,000 hour salt spray test.
 - 10) Drive wheels: Two 6" diam (152 mm) AdvanceDrive wheels. High-strength composite hub with polyurethane over mold.
 - 11) Drive rail: Shall be extruded 6061 T6, not less than 1/8" (3 mm) thick. Drive rail shall incorporate alignment pins for ease of replacement or splicing. Pins shall enable a perfect butt splice.
 - 12) Hydraulic hose: Shall be 1/4" (6 mm) synthetic, rated to 3,000 psi (20.6 MPa).
 - 13) Hydraulic valves: Shall be individually replaceable cartridge type, in an integrated hydraulic manifold.
 - 14) Hose fittings: At manifold shall be quick-disconnect type, others shall be swivel type.
 - 15) Hydraulic fluid: High performance type with a viscosity index greater than 375 and temperature range -40° F to 158° F (-40° C to 70° C).
 - 16) A zero to 2,000 psi (13.7 MPa) pressure gauge, mounted on the manifold for diagnostics, shall be a standard component.
 - 17) The hydraulic fluid reservoir shall be formed from a single piece of metal, non-welded, and shall be powder painted on the inside and the outside, to prevent fluid contamination.
- b. Minimum standard electrical components:
- 1) Pump motor: 1 hp, 3 phase, 460V, 3450 RPM, 56C, TEFC.
 - 2) All components shall have overload protection.
 - 3) Electrical enclosure: Type 1, metal, with hinged lid gasketed for protection from intrusion of foreign objects.
 - 4) Controls: Smart Touch Controller Board containing:
 - a) inherent entrapment sensor;
 - b) photo eye detector
 - c) gate 'edge' sensor
 - d) Fine Release/lock box
 - (1) Battery backup for power loss
 - e) built in audible "warn before operate" system;
 - f) built in timer to close;
 - g) 32 character OLED display for reporting of functions and codes;
 - h) multiple programmable output relay options;
 - i) anti-tailgate mode;
 - j) built-in power surge/lightning strike protection;

- k) menu configuration, event logging and system diagnostics easily accessible with a PC and HySecurity's free Smart Touch Analyze and Retrieve Tool;
 - l) RS-232 port for connection to laptop or other computer peripheral and RS-485 connection for network interface.
 - m) Dual gate communication connection for bi-parting, sally port, or sequenced gates.
 - n) Electromechanical and solid state relays.
 - o) Radio option outputs.
 - p) 21 inputs for site specific configurations.
- c. Transformer: 75 VA, non-jumpered taps, for all common voltages.
 - d. Control circuit: 24 VDC.
2. Factory Testing
- a. Fully assemble and test, at the factory, each gate operator to assure smooth operation, sequencing and electrical connection integrity.
 - b. Proof test with simulated physical and electrical loads to exceed the fully rated capacity of the operator components.
 - c. Inspect and test all hydraulics are leak free.
 - d. All testing data shall be individually logged and recorded by serial number.
 - e. Check all mechanical connections for tightness and alignment. Check all welds for completeness and continuity.
 - f. Inspect finishes for completeness. Touch up imperfections prior to shipment.
 - g. Check all hydraulic hoses and electrical wires to assure that chafing cannot occur during shipping or operation.
- E. Reversing Safety Edge:
- 1. Provide a reversing safety edge that will immediately stop the electric gate operator and reverse its direction whenever the leading edge of the gate encounters an obstruction with a force of 4 pounds or more.
 - 2. Miller Edge #ME-123; Anchor Group; or equal.
- F. Safety Loop and Loop Detector: Outside, shadow, and free exit loops. Safety loops shall be installed in asphalt driveway on both sides of the fence. The safety loop shall include PVC coating for direct burial conforming to UL 493. The loop detectors shall be used to prevent a gate from closing when a vehicle is in the opening, or to open the gate when a vehicle is entering or exiting. Loop detector shall be compatible with the Gate Operator and Proximity Card Reader/Keypad provided. Provide necessary pin connectors between wire loops and loop detectors. All the controls must be accessible for easy installation and operation. Provide surge protection on all inputs and outputs of the detector, and grounding stakes per electrical code.
- G. Control of Gate Operator:
- 1. Provide programmable wireless gate controller and three portable operators remote control of gate operator is specified under Division 16.
 - 2. Provide for local emergency operation of gate by Fire Department or Owner under both power on and power failed conditions. Provide support and mounting for Knox electric switch) for emergency use on both sides of gate.

2.04 STEEL GATE, SWINGING

- A. Provide steel swinging gates. Builders Fence Company, Inc.; Amazing Gates; Iron Fence Shop; or equal.
 - 1. Swinging gates shall be as shown on the Drawings and shall be constructed as follows:
 - a. All components shall be steel tube, all joints shall be welded. All steel members to be hot-dip galvanized after fabrication. Finish to match fence panels.
 - 2. Gate frame shall be 3-inch x 3-inch x 0.125-inch tube. Weld corners to create a rigid frame. Provide a 2- x 3-inch horizontal rail near the top of the gate that lines up with a similar fence rail.
 - 3. Pickets shall be 1-inch x 1-inch x 0.65-inch steel tube spaced 6-inches o.c.
 - a. Each picket to be capped with fleur de lis-style pointed top. Color to match pickets. Provide barrier coating at dissimilar materials.
 - 4. Provide matching "puppy panels". Place between full-size pickets. Provide matching picket tops.
 - 5. Fence post tops:
 - a. Zinc alloy die cast ball. Color to match pickets. Provide barrier coating at dissimilar materials.
- B. Gate Hardware: Hinges, operator arms, and idle roller on end of swinging section, shall be Richard-Wilcox; Stanley; or equal.
- C. Finish:
 - 1. All steel material shall be hot-dip galvanized G-90.
 - 2. Rinse and clean.
 - 3. Steel material to be phosphate etch, rinse clean and oven dry.
 - 4. Steel First Coat: Powder coat with zinc-rich epoxy primer.
 - 5. Steel Second Coat: Polyester powder coat, 3.5 mils average dry film thickness and bake at 450°F.

PART 3 - EXECUTION

3.01 PREPARATION

- A. The contractor shall layout the new fence in accordance with the drawings, shop drawings, and all applicable requirements and codes.
- B. The contractor shall verify any grade changes or surface irregularities.
- C. Discrepancies between the approved shop drawings and field conditions must be approved by the Engineer prior to proceeding with the installation.

3.02 INSTALLATION

- A. Fence and gate posts shall be set plumb and level at locations shown on the drawings.
- B. Excavate for concrete foundations. All concrete foundations shall be as shown but not less than listed in paragraph 2.02.D.1 of this Section. Place rebar and pour concrete for foundations in accordance with Section 03300.
- C. Fence panels shall be welded or bolted to the posts. Field welding of rail to the post shall be a complete 360 degree (all four sides) and shall be the size indicated on the shop drawings. Welds shall be cleaned and coated with a primer the same

day the welding is performed. Bolted connections shall use bolts and tabs of the size indicated on the drawings. After tightening bolt, threads shall be peened. Provide barrier coating at dissimilar materials.

- D. Gates shall be installed plumb and level and shall be the sizes and style indicated on the drawings. Install sliding and swinging gate sections and hardware in accordance with manufacturer's instructions. The contractor shall install any gate stops that may be required. Any padlock provisions or strikes shall be field attached to assure alignment. The contractor shall lubricate the hinges, rollers and other gate hardware after installation. Provide barrier coating at dissimilar materials.
- E. All field welds and any abrasions to factory coatings shall be thoroughly cleaned, re-primed and touched up by the contractor with paint of the same quality, color and gloss of that used by the manufacturer.
- F. Adjust gates for smooth easy operation.

3.03 GATE OPERATOR INSTALLATION

- A. General:
 - 1. Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.
 - 2. Installer shall ensure that the electrical service to the operator is at least 20A. Electrical wiring to conform to NEC and manufacturer's installation instructions.
- B. Excavation for Support Posts, Pedestals, or Concrete Base/Pads:
 - 1. Hand-excavate holes for bases/pads, in firm, undisturbed soil to dimensions and depths and at locations as required by gate-operator component manufacturer's written instructions and as indicated.
- C. Concrete Base/Pads:
 - 1. Cast-in-place or precast concrete, depth not less than 12 inches, dimensioned and reinforced according to gate-operator component manufacturer's written instructions and as indicated on drawings.
- D. Vehicle Loop Detector System:
 - 1. Locate, bury, and seal wire loop according to manufacturer's written instructions. Connect to equipment operated by detector.
- E. Grounding:
 - 1. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

3.04 GROUNDING AND BONDING

- A. General: Per Section 02820

3.05 FIELD ADJUSTMENTS

- A. Automatic Gate Operator: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices, alarms, and limit switches.
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

2. Test and Adjust Controls. Equipment to be tested includes strobe switches/detectors, fire department key switch, gate operators, alarms, and safeties. Replace damaged and malfunctioning controls and equipment.
3. Lubricate hardware, gate operator, and other moving parts.

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SECTION 02915
SOIL PREPARATION

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Soil preparation areas are indicated on Landscaping drawings and also referred to as Landscape Topsoil and Compost Limits.

1.02. SUMMARY

- A. This Section includes the following:
 - 1. The work covered in this section consists of furnishing all labor, materials and equipment for testing, preparation, and placement of topsoil and compost as indicated by the drawings and as specified.
 - 2. Coordinate placement of topsoil and required soil amendments with the establishment of rough grades.
 - 3. Coordinate depths of soil amendments and topsoil with grading specifications for rough and finish grades.
 - 4. All rough grading operations shall be completed as required by these specifications. Topsoil placement or backfilling in areas to be landscaped shall not occur until the Owner's Representative has issued written approval of the rough grade and topsoil.

1.03. DEFINITIONS

- A. Soil classifications standards used herein for existing and imported soils include but are not limited to the following:
 - 1. ASTM Soil Quality Standards:
 - 2. Classification: ASTM D 2487-00
 - 3. Gradation of Soils: ASTM D 422-63 (1998)
 - 4. Liquid Limit and Plasticity Index: ASTM D 4318-94(2001)e1
 - 5. Moisture-Density Relations: ASTM D 1557-00
 - 6. Permeability of Soils: ASTM D 2434-68(2000)
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.
- D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- 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 completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

- 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.
- I. ODA: Oregon Department of Agriculture.
- J. ODOT: Oregon Department of Transportation.

1.04. SUBMITTALS

- A. Product Data: For the following:
 - 1. Fertilizers, including application rates.
- B. Samples for Verification: For the following:
 - 1. 1/2 cubic foot of each imported manufactured topsoil. Furnish one sample from each site from which soil is to be furnished.
- C. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis for standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- D. Qualification Data: For testing agencies.
- E. Delivery Slips: Provide delivery slips as proof of shipment of specified materials.

1.05. QUALITY ASSURANCE

- A. Soil Preparation - All soil preparation work shall be done under the supervision of a Contractor having experience in landscape construction. All work shall be done in accordance with proper horticultural practices.
- B. Herbicide Application - Applications of herbicide for weed control, as required, shall be made only by an applicator currently licensed under State and Federal law.
- C. The Contractor shall store fertilizer and other required materials in a dry place and free from the intrusion of moisture.
- D. All topsoil and compost must be tested by an independent testing laboratory and certified that it is in conformance with the requirements of these specifications.
- E. Soil/Compost Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- F. Topsoil Analysis: Furnish soil analysis 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 topsoil. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
 - 1. 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.
- G. Compost Analysis: Furnish compost analysis by a qualified testing laboratory stating the volumes, quantities, and ratios of component parts specified.
1. Compost Analysis Report must include analysis of suitability of compost for plant growth. State volumes and quantities of recommended amendments necessary to produce satisfactory compost.

1.06. PROJECT CONDITIONS

- A. Prior to the work of this section all rough graded surfaces shall be free of:
 1. Concrete, asphalt, and other construction debris;
 2. Limbs, twigs, cones, seed-pods and other woody material; and
 3. Rock, gravel or other material not suitable for plant growth.
- B. In all **soil preparation** areas the sub-grade shall be free of unsuitable material such as stumps, roots, rocks, concrete, asphalt, or metals, for a minimum depth of 24 inches. .
- C. The Contractor shall provide protective covers and barriers as necessary to prevent damage and staining to all site improvements.
- D. The Contractor shall prepare topsoil only when weather and soil conditions allow. Do not attempt soil preparation work when weather or soil conditions would contribute to poor or improper mixing, voids, or other adverse conditions.
- E. The Contractor shall take all reasonable precautions to prevent runoff of topsoil and fertilizers from leaving site or entering storm systems, or any waterway.

1.07. SEQUENCING AND SCHEDULE

- A. Coordinate soil preparation work with installation of other site improvements.
- B. Soil preparation shall not take place during periods where saturated soil or surface water is present in work areas.
- C. Work shall not take place when temperature is less than 32 degrees Fahrenheit, or when frozen soil exists on site.

PART 2 - PRODUCTS

2.01. TOPSOIL

- A. **Shall consist of imported or moisture conditioned native soil free of salts, weeds, or other materials harmful to plant growth and meeting ODOT Standard Specification Section 01040.14(a) Selected Topsoil, or (b) Imported Topsoil. If Selected Topsoil is unable to meet the specifications, Contractor shall provide Imported Topsoil. Topsoil shall meet the following requirements:**
 1. Acidity range (pH) of 5.5 to 7.

2. A minimum of 4 percent, and a maximum of 20 percent organic material content by volume.
3. A maximum of 25 percent decaying content by volume.
4. Free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

2.02. INORGANIC SOIL AMENDMENTS

- A. In accordance with ODOT Standard Specification Section 01040.16 Soil Amendments:

2.03. ORGANIC SOIL AMENDMENTS (COMPOST, OR SOIL CONDITIONER)

- A. Compost: Well-composted, stable, and weed-free organic matter, in accordance with ODOT Standard Specification Section 01040.15 Soil Conditioners.

2.04. FERTILIZERS

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. 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 agency.

2.05. POST-EMERGENT HERBICIDE

- A. Post-emergent herbicide shall be as directed for condition by currently licensed herbicide applicator.

2.06. WATER

- A. Water shall be suitable for irrigation, free from oil, acid, alkali, salt or other substances harmful to plant life.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. The Contractor shall examine the entire site for conditions that will adversely affect execution, permanence and quality of work, and survival of plant materials. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Rough Grading Inspection - Contractor shall notify Owner's Representative a minimum of 72 hours in advance for inspection of rough grades.
- C. The Contractor shall verify that rough grades and slopes of areas to be planted areas are set at sufficient depth to allow for placement of specified materials. If the site is not suitable for landscaping operations, the Contractor shall perform necessary corrective work.

3.02. GENERAL PREPARATION OF GROUND SURFACES – ALL **LANDSCAPING TOPSOIL AND COMPOST LIMIT AREAS**

- A. The Contractor shall eliminate uneven areas and low spots, remove lumber, stones, sticks, mortar, concrete, rubbish, debris, contaminated soil and any other material harmful to plant life, in shrub and ground cover beds.
- B. The Contractor shall verify that invasive species and weeds have been eliminated prior to the placement of topsoil. The Contractor must not place topsoil until all living weed matter has been eliminated.

3.03. PLACING PLANTING SOILS

- A. Verify that planting soil is stockpiled in sufficient quantities to be placed at depths specified. The Contractor shall notify the Owner's Representative immediately if supplies are inadequate or do not meet specifications for topsoil. The Contractor shall provide imported topsoil meeting the requirements of this section if the supply of existing on-site topsoil is insufficient.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities, and existing lawns and exterior plants from damage caused by soil preparation operations.
- C. Prepare soils at a time when moisture conditions will permit proper cultivation.
- D. Remove stones over 1-inch diameter, sticks, roots, mortar, concrete, rubbish, debris, and all materials harmful to plant life, and legally dispose of them off Owner's property.
- E. Remove or spray as required to eradicate noxious weed growth and roots.

3.04. SOIL PREPARATION **WITHIN LANDSCAPE TOPSOIL AND COMPOST LIMIT AREAS**

- A. Loosen subgrade of **landscaping areas** to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Spread topsoil mix to a depth of 6 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 mix over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil mix.

2. Spread Soil Conditioner (Compost) to a depth of 3 inches over the top of the prepared Topsoil. Till Soil Condition into Topsoil to provide a well blended, homogenous soil profile.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Finish grade after full settlement including mulch, shall be ½ inch below tops of curbs, walks, or existing grades in shrub areas.
- C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.05. CLEANUP AND DISPOSAL

- A. Keep project site free from accumulation of debris, topsoil, and other material.
- B. At completion of each area of work, completely remove debris, equipment and surplus materials.
- C. Any paved area or surfaces stained or soiled from landscaping materials shall be cleaned with a power sweeper using water under pressure. Building surfaces shall be washed with proper equipment and materials as approved by the Owner's Representative.
- D. Remove surplus soil and waste material, including excess topsoil, unsuitable soil, trash, and debris, and legally dispose off Owner's property.

END OF SECTION