CITY OF ALBANY
Public Works Department

ADDENDUM #5

SS-19-05,
RIVERFRONT WET WEATHER LIFT STATION
AND FORCE MAIN

In order to clarify the intent of the Specifications and Drawings, the following provisions are provided and shall be considered part of the contract documents.

In order to ensure that all bidders are aware of these provisions, each bidder shall sign this addendum below and attach it to the proposal.

IMPORTANT: Failure to include a signed Addendum could result in the disqualification of your bid.

APPENDIX B:

Section 02260 – EXCAVATION SUPPORT AND PROTECTION (as modified in Addendum #3):

Replace existing Section 02260 as modified in Addendum #3 with the new attached Section 02260. The new language makes several changes which include the following:

- **Removed prescriptive excavation support requirements and placed the responsibility on the Contractor**
- **Revised E80 railroad loading requirement only for shoring adjacent to the railroad and not backfilled and compacted each night**
- **Revised requirement for signed, engineered documents for shoring at the pump station excavation and for trenches subject to train loads only**
- **Added general statement calling for all shoring and equipment adjacent to the railroad to be removed or advanced to grade at the end of each day to allow trains to pass outside of normal working hours.**

Contractor's Signature _____ Date _____

Company Name *(please type or print)* _____

SECTION 02260

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Temporary excavation support systems for utility installations associated with trenching and deep excavations for the diversion structure and pump station wet well.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01330 – Submittals
2. Section 02300 – Earthwork
3. Section 03600 – Grout
4. Section 02262 – Settlement Monitoring

1.03 REFERENCES

A. Geotechnical Engineering Report, Riverfront Interceptor Sewer Pump Station and Force Main, by Shannon & Wilson.

B. References in this Section to the City of Albany Standard Construction Specifications means the January 2018 edition as published by the City of Albany.

1.04 DEFINITIONS

A. Protection Systems:

1. Sloping or benching systems for excavated slopes.
2. Structural support systems, shield systems, and other systems for preventing excavation wall failure.

B. Boulders larger than 24 inches in diameter are considered an obstruction.

C. Cobbles and small boulders between 12 inches and 24 inches in diameter are not considered obstructions or differing site condition.

1.05 SUBMITTALS

A. Prepare and submit in accordance with Section 01330.

B. Submit information as a complete package. Include all items required by the Contract Documents. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package.

C. Shop Drawings for pump station and diversion structure excavation support and support for open trenches left in place after work hours and subject to train loads

1. Prepared, signed and sealed by a professional engineer who is registered to practice in the State of Oregon.

2. Clearly indicate structural sections of shoring members, welding details, bolting details and bracing details.

3. Indicate existing and new structures, pipelines and other improvements located in the vicinity and impacting the design of the shoring system.

4. Provide details for bracing, reinforcement and sealing around penetrations.

D. Calculations for pump station and diversion structure excavation and support for open trenches left in place after work hours and subject to train loads: Structural calculations verifying and demonstrating the structural safety and adequacy of the sheeting, shoring and bracing to be used. Geotechnical calculations related to lateral earth pressure described below.

1. Prepared, signed and sealed by a registered professional civil or structural engineer who is registered to practice in the State of Oregon.

2. Provide calculations for the different load, support and other conditions that occur during the sequence of installation, construction of facilities protected by the shoring and the sequence of removal of the internal bracing and shoring.

3. Provide lateral earth pressure diagrams for the various conditions, including construction and train surcharges as appropriate.

E. Qualifications of registered professional engineer and shoring installer, including project references.

F. Prepare a detailed plan illustrating the sequence of installation and removal of shoring systems and internal bracing. Include sketches showing the various stages in the sequence.

G. Prepare a contingency plan for immediate corrective action if voids are created behind the lateral restrained shoring systems.

H. Prepare a contingency plan for corrective action if Defection Criteria described in this specification is exceeded.

I. Letter confirming installation of the shoring system is in accordance with the shoring design.

1.06 INSTALLER QUALIFICATIONS

A. Shoring installer must have a minimum of five successful past installations of shoring systems of comparable overall heights and comparable penetration of soils similar to those found on the project site. Provide qualifications for projects comparable to the pump station and pipeline.

1.07 PERFORMANCE REQUIREMENTS

A. Design and install excavation support and protection systems that are capable of:

1. Supporting excavation sidewalls and bottom to maintain the required excavation or trench section.

2. Resisting soil and hydrostatic pressure, superimposed construction loads, Cooper E80 railroad live load, and other live loads. For trench excavation adjacent to the railroad tracks, Cooper E-80 live load shall be used for trenches that are not backfilled and compacted during non-working hours

3. Protecting existing facilities in the vicinity of the excavation from damage due to settlement or movement of soil.

4. Providing positive lateral support of excavation side walls adjacent to the Railway and other facilities sensitive to lateral movement.

B. For shoring systems at the pump station and trenches subject to railroad loading provide professional engineering services necessary to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer(s) registered in the State of Oregon.

C. Install and remove excavation support and protection systems without damaging existing buildings, pavements, utilities, railroad facilities and other improvements adjacent to excavation.

D. Excavations

1. Protect workers from hazard of caving ground and other hazards.

2. Install excavation protection system described in this specification in locations where:

a. Protection system is specifically indicated on the Drawings.

b. Excavations are equal to, or greater than, 5 feet deep.

c. Excavations are less than 5 feet deep, but there is a potential for cave-in.

d. Excavations near to, and parallel to the railroad.

e. When engineering analyses prepared by the Contractor indicate the stability of existing structures and facilities may be jeopardized by settlement and/or lateral movement of soil.

1.08 GENERAL DESIGN REQUIREMENTS

A. Design excavation support systems to meet requirements and standards of the Occupational Safety and Health Administration (OSHA).

B. Design excavation support systems to meet the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P for excavations less than 20 feet deep. Excavations that are greater than 20 feet must be designed by a registered professional engineer for the specific site conditions.

C. Design structural steel members in accordance with the American Institute of Steel Construction (AISC) Manual of Steel Construction Allowable Stress Design and the Uniform Building Code.

D. Excavation support systems for trench excavations shall be selected by the Contractor based on the requirements in this specification, including Defection Criteria below, soil conditions, depths of excavations, groundwater/perched water conditions and other site conditions.

E. Allowable Deflection: Not more than 1/2-inch at any point on the shoring system.

1.09 GEOTECHNICAL ENGINEERING REPORT

A. A geotechnical engineering report has been prepared for this Project that contains data collected and interpretations, and options. This geotechnical report is not part of the Contract Documents. Copies of this report are available upon request. The data portion only can be relied upon. The interpretations and opinions portion is available for reference information only. The interpretations and opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. The Owner will not be responsible for interpretations or conclusions drawn from this portion of the report.

B. No Explorations were performed along approximately 4,900 linear feet of the pipeline along Water Avenue and parallel to the railroad alignment.

1. Make additional test borings and conduct other exploratory operations as necessary for design and construction of the excavation support systems.

1.10 JOB SITE POSTINGS

A. Maintain at least one copy of the protection system design at the job site while the excavation is open in accordance with the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P.

1.11 SEQUENCE AND SCHEDULING

A. Do not begin excavations or installation of excavation supports until submittals for excavation support systems have been accepted by the Engineer, required monitoring systems are in place as described in this specification and Section 02262 Settlement Monitoring, and until materials necessary for installation are on site.

B. Do not begin excavations or installation of excavation supports until initial survey measurements on control points on existing structures and other improvements are obtained to document initial elevations and locations, and measurements provided to the Engineer.

C. Coordinate with Portland & Western Railroad (PNWR) to determine maximum train load widths allowed on the tracks in the vicinity of the Project. All shoring within the maximum train load width plus 5 feet on each side must be flush with the ground or finished by the end of the working day to allow safe passage of the trains. Shoring cannot interfere with railroad operations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Materials described in Excavation Support and Protection Contractor's submittals approved by the Engineer, and as required by other portions of the Contract Documents.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to beginning installation of the excavation support system, pothole to locate existing buried utilities in the vicinity of the excavation. Survey utilities and compare actual locations to those locations indicated on the Drawings and the Shop Drawings. Determine any areas of conflict and revise the design and layout of the excavation support system to eliminate these conflicts.

3.02 SLOPING AND BENCHING OF EXCAVATED FACES

A. Where excavation support systems are not required by this specification or not specifically indicated on the Drawings, sloping and benching systems for exposed faces of excavations may be utilized in accordance with OSHA requirements and standards.

B. Construct sloping and benching systems in accordance with Section 02300.

3.03 TRENCHING AND EXCAVATION SUPPORT SYSTEMS

A. Excavation support systems must conform to types of temporary shoring capable of penetrating cobbles.

B. Soldier Piles

1. Soldier Piles if used by the Contractor shall be installed by drilling only to the full depth of embedment.

2. Full-depth temporary casing shall be required while drilling in piles due to presence of gravels, cobbles, boulders, and caving soils.

3. When drilling the Contractor shall be prepared to penetrate, by pass or remove cobbles, boulders, and other obstructions as necessary.

4. After a soldier pile has been placed in the hole, the hole shall be backfilled with grout or a concrete mix, and in accordance with accepted submittals.

5. Adjacent drilled holes shall not be placed closer than three-hole diameters center-to-center until any grout or concrete mix placed in the hole has set for a minimum for 24 hours.

C. Any shoring system components or equipment adjacent to the railroad must be removed or advanced to the ground surface at the end of each work day such that they do not impede train traffic at night.

D. Lagging shall maintain continuous lateral restraint support of excavation side walls. Lagging shall be installed as indicated on the Contractor-prepared plans, applicable codes and regulations, and good construction practice. In addition, the following minimum requirements shall be met:

1. Lagging shall be provided at all locations where the clear distance between soldier piles is 2 feet or greater or soil conditions are such that the safety of the workers or stability of the excavation requires continuous soil support.

2. Install lagging from existing grade downward as the excavation progresses using steel sheeting or other method as designed by the Contractor.

3. If voids occur behind the lagging immediately implement corrective action described in approved submittal as the lagging construction progresses.

E. Sheeting and Shoring During Backfilling and Removal.

1. Contractor shall assume complete responsibility for, adequate protection systems for prevention of damage to existing facilities during installation, backfilling and removal, as appropriate.

2. Trench sheeting shall be removed unless, in the opinion of Engineer, removal of the sheeting will cause damage to the facility it is protecting or loss of necessary piping support from the piping embedment. If left in place, the sheeting shall cut off 12 inches below finished grade. The design of the support system shall be such as to permit complete removal while maintaining safety and stability at all times.

F. Bracing

1. Locate bracing to clear temporary and permanent work and to allow lowering of material and equipment into the excavation.

2. If necessary to move brace, install new bracing before removing original brace.

3. Install internal bracing as described in approved submittals and when calculations indicate bracing is required to prevent spreading or distortion of braced frames.

4. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures, railroad surcharge loading, and other lateral pressures.

3.04 INSPECTION AND REPORTING

A. Designer of the shoring system is responsible for confirming proper installation of the shoring system. Shoring system designer, or a representative of the designer,

shall make site visits to confirm installation is in accordance with the accepted shoring design.

B. Submit weekly reports or more frequent if required by the Engineer of proper installation confirming installation is in accordance with the shoring design.

C. If Deflection Criteria exceeds the limits in this specification, Contractor must immediately report measurements to the Owner and Engineer including implementing planned corrective action, followed by written documentation of measurements and correction plan within 24 hours.

3.05 MONITORING OF SHORING SYSTEMS

A. The Contractor shall monitor and record readings on the temporary shoring and railroad tracks to detect any and vertical horizontal movements. The monitoring and recording shall be as specified below and in accordance with Section 02262.

B. At the Pump Station, and diversion structure manhole excavations, readings shall be at the top of the wall, and adjacent to or on the edge of the railroad tracks closest to the excavation, generally equally spaced locations along each 40-foot length of wall perimeter. Readings shall be taken initially after installation of soldier piles or other vertical elements, after midpoint of the vertical excavation is reached, and within one week of the completed excavation and shoring wall. Thereafter, additional readings shall be made at the request of the Engineer not to exceed monthly readings unless the horizontal movement exceeds specified amounts of the deflection criteria specified in this Section. If horizontal or vertical movements are exceeded, the number and frequency of reading shall be increased to define the areas of excess movement in a manner acceptable to the Engineer.

3.06 REMOVAL

A. Remove excavation support and protection systems when backfill can support the remaining open excavation and bear soil and hydrostatic pressures. Remove support and protection systems in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

B. After removal, promptly fill voids resulting from the extraction of shoring with sand-cement grout conforming to the requirements of Section 03600. Repair or replace adjacent work damaged or displaced by excavation support and protection systems removal.

END OF SECTION