

SCOPE OF WORK

This memorandum outlines Tetra Tech's scope of work for engineering services associated with predesign and final design of the following project identified by the City:

- Extention of the sanitary sewer on Beaver Creek Road approximately 3,800-feet. The project starts at the manhole just south of Marjorie Lane where the pipe splits with one leg entering the Clackamas Community College property, and one leg located in the middle of Beaver Creek Road. The alignment proceeds south approximately 3,800-feet to the High School. In the Site Development Report the ending point is defined as the south end of the second property past Loder Road.

This alignment includes upsizing the last two lengths of the public sanitary sewer on Beaver Creek Road, reconnection to the sanitary sewer on the Clackamas Community College property, and abandonment of the private sanitary sewer in the public right-of-way that serves the High School.

- In addition, verify that the sanitary sewer can be extended to the end of the City Limits on Beaver Creek Road just past S. Timbersky Way. This would entail a rough vertical design of the sanitary sewer. The length is an additional 5,500-feet.

The scope of work is based on a discussion of the project with City staff, review of 2014 Master Plan and field reconnaissance.

TASK 1—PROJECT MANAGEMENT & ADMINISTRATION

Subtask 1.1 Project Administration/Progress Reports/Invoices

This subtask includes contract administration and invoicing. This task includes management of the schedule and effort. A monthly progress report provided with each billing will report the status of the project and the level of effort expended. This also includes bi-weekly phone calls with the City.

Subtask 1.2 Startup and Progress Meetings

The startup meeting will focus on such project and design topics such as communication protocols, as-built drawings and other data to be transferred, pipe alignment criteria, utility conflicts, and project schedule.

There will be three meetings during the design of the project to keep City staff up to date on design issues and project status. The meetings are scheduled at start-up, preliminary design submittal, and 90% design submittal.

Subtask 1.3 Subconsultant Coordination

This task provides the necessary supervision to ensure that the work of the surveying and geotechnical subconsultants are appropriately integrated into the design effort.

Subtask 1.4 Quality Assurance QA/QC

Tetra Tech in-house quality assurance program provides for an independent review by a senior engineer separate from the project team. The quality assurance review includes a review of the predesign memorandum and a buildability and constructibility review at the 90% complete stage.

TASK 2—DATA COLLECTION

Subtask 2.1 Evaluate Background Information

2.1.1 The improvements recommended in the 2014 Master Plan will be evaluated with regard to the Beavercreek pipe. This includes sizing, flows and the impact of future pump stations. The Master plan indicates that there is surcharging in the line between Marjorie Lane and the Clackamas Community College, but does not recommend upsizing the line. As this would be the appropriate time to up-size the pipe, the amount of surcharging will be reviewed with the City to determine if a modification to the Master Plan recommendation is appropriate.

2.1.2 The Beavercreek Concept Plan has not yet been approved, however the document will be reviewed to determine if the proposed future street section should be considered with regard to the horizontal alignment of the sanitary sewer.

2.1.3 Beavercreek Road is owned by Clackamas County, therefore the backfill, restoration and permitting requirements will be reviewed and documented. The construction permitting requirements will be reviewed.

2.1.4 Key City of Oregon City design standard requirements will be documented.

Subtask 2.2 Predesign Field Survey (by Bush Surveying)

A full design survey will be conducted along the proposed alignment. This will include elevations, utilities (public and private), sanitary sewer inverts, culvert inverts, structures, pavement, sidewalk, large vegetation and property pins where accessible. From the High School to the City Limits the survey will only include the edge of asphalt elevation at 50-foot intervals. Elevations will be based on vertical control tied to a City of Oregon City or Clackamas County Survey benchmark (USGS vertical datum). The final product of this subtask will be survey base drawings in AutoCAD format.

Subtask 2.3 Geotechnical Investigation (by Foundation Engineering)

In order to provide gravity flow to the end of the City Limits it is likely that there will be some locations of deep sewer. The City is concerned that there may be solid rock at some locations. Therefore, one day of borings will be conducted along the alignment, which will accomplish 2 to 3 borings depending upon the difficulty of the boring. The maximum depth will be 25-feet and will be based upon field conditions and proposed sanitary sewer depth. The boring will include a maximum of 15-feet of rock core. A geotechnical report will be provided.

The location and depth of the borings will be directed by Tetra Tech based upon a review of a preliminary pipe profile.

TASK 3—PRELIMINARY DESIGN

Subtask 3.1 Preliminary Alignment

The work performed in Subtasks 2.1 through 2.3 will be used to prepare a preliminary horizontal and vertical alignment. This will include evaluating the vertical alignment to the City Limits to determine if the existing sanitary sewer needs to be lowered in order to provide the depth required for gravity flow. Based upon the results the extents of the project may need to be modified.

The vertical alignment will also be used to verify the pipe sizing based upon the flows identified in the Master Plan.

Subtask 3.2 Preliminary Design Memorandum

The memorandum will include the basis of design, pipe sizing and material, street restoration requirements, and 30% plan and profile drawings (6 sheets). A preliminary cost estimate will be included with the memorandum.

Subtask 3.3 Final Design Memorandum

The memorandum will be modified based upon comments from the City.

Task 4— PLANS, SPECIFICATIONS AND ESTIMATE

Subtask 4.1 Submit 90% Complete Design Drawings

The bid documents will be developed based upon the design memorandum. If the project does not need to be expanded, ten sheets are expected in the design package:

1. Cover Sheet, Sheet Index, Design Data
2. Legend, Abbreviations, General Notes
3. Project Key Map
4. Plan and Profile
5. Plan and Profile
6. Plan and Profile
7. Civil Details
8. Civil Details
9. Erosion Control Plan
10. Erosion Control Details

It is assumed that by-pass pumping and traffic control plans will be developed by the contractor.

All new sewers will be on plan and profile drawings (1"=50' horizontal and 1"=5' vertical scale). Three halfsize sets of drawings and a .pdf plan set will be submitted to the City for review. Tetra Tech will

attend a meeting with City staff to review the design and answer questions. Specification Divisions 0 and 1 will use the City standard documents modified by Tetra Tech as required for the project. Technical specifications will be modifications to the ODOT/APWA standard specification as provided by Tetra Tech. An electronic copy will be submitted to the City for review.

The construction cost estimate will be updated.

The City will provide the permit submittal to the DEQ.

Subtask 4.2 Utility Coordination

This task includes contacting the private utilities and sending them a set of 90% contract documents. The City will follow up with the private utilities and coordinate any work needed to be done by the private utilities.

Subtask 4.3 Final Design Drawings and Specifications

After comments are received from the City, DEQ, private utilities and from Tetra Tech's internal quality assurance review, final construction plans and specifications will be prepared. One original reproducible full-size plan set will be provided as well as two half-size sets. The final bid document and technical specifications will be provided in Microsoft Word format. Electronic files of the design drawings (.pdf files) will also be provided for use by the City.

CONTINGENCY TASKS

Task 5 and 6 are not included in the original work authorization, but are shown here to indicate the services that will be provided when the City is ready to move forward with the construction of the project. The scope and fee for these tasks would be negotiated at that time.

TASK 5—BID PHASE SERVICES

Subtask 5.1 Respond to Bidder's Questions

Tetra Tech staff working on the project will answer questions arising from contractors and suppliers. The City will be notified of all clarifications and any recommendations with respect to addenda items.

Subtask 5.2 Pre-Bid Meeting, Addenda/Clarifications

Tetra Tech will attend the pre-bid meeting at which contractor questions will be addressed. Assistance to the City with addenda preparation (two) will be provided as requested, and assistance reviewing the bids.

It is assumed that the city will distribute the design document, keep the plan-holders list, perform the bid opening, make the award recommendation, and perform the contracting.

TASK 6—CONSTRUCTION MANAGEMENT SERVICES

Subtask 6.1

Tetra Tech staff will assist in the construction management including the following services: attend and facilitate the pre-construction conference and bi-weekly construction meetings, review submittals, respond to RFI's, develop RFQ's, review change order requests, and assist with construction issues.

The City will provide the daily construction observation, review and approve pay requests and change orders, and attend construction meetings.

Subtask 6.2 Project Close Out

Tetra Tech will attend the substantial completion inspection, develop the punch list, and attend the final walk through. Tetra Tech will also provide the DEQ certification that the construction was completed in accordance with the plans and specifications.

Subtask 6.3 Record Drawings

Tetra Tech will provide record drawings based upon the information provided by the Contractor, the construction observer and meeting notes.

TO BE PROVIDED BY THE CITY

The City will provide access to the City staff portion of the city web site where much of the following information is available.

- As-built drawings of the project area
- Sanitary Sewer Master Plan
- Beavercreek concept Plan
- Other Planning documents in the area as appropriate
- Design Standards
- City standard specification sections (front end)
- Any service agreements with other utilities in the area
- Available utility information

PERMITTING

It is assumed that the only permits required would be approval from the DEQ for the design plans, and a construction permit from Clackamas County for work in the road. As the construction timeframe will depend upon the funding, it is recommended that the Clackamas County permit be obtained when the construction schedule is known.

SCHEDULE

The work will start when the notice to proceed is provided. It is assumed that will be provided by July 1, 2016. The design work (tasks 1, 2, 3 and 4) will be completed in five months. A preliminary schedule is provide below, which will be adjusted when the actual NTP is received..

NTP	July 1, 2016
Data Collection	July 11 through Aug 8, 2016
Preliminary Design Report	August 8 through Sept 9, 2016
90% PS&E	Sept 9 through Oct 31, 2016
Final Design	Oct 31 through Nov 30, 2016
Bid Services	TBD based upon construction funding