



COPY

Resolution No. 2001-961

A RESOLUTION AUTHORIZING THE CITY MANAGER TO ENTER INTO A CONTRACT WITH DAVID EVANS AND ASSOCIATES, INC. FOR DESIGN OF SANITARY SEWER RELOCATIONS FOR WASHINGTON COUNTY'S OREGON STREET PROJECT

WHEREAS, Washington County is designing and constructing major improvements to Oregon Street between Tualatin-Sherwood Road and G&T Drive; and

WHEREAS, the improvements to Oregon Street require relocation of the city's sanitary sewer mains; and

WHEREAS, the county's designers, David Evans and Associates (DEA), can most efficiently design the required sanitary sewer relocations and incorporate these changes into the construction drawings for the road project; and

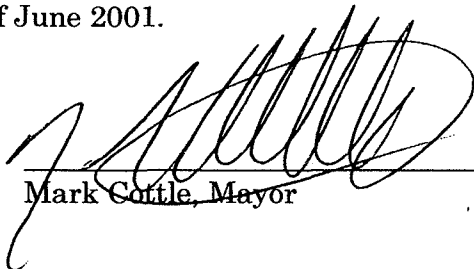
WHEREAS, DEA proposed a project scope and budget of \$19,650; and

WHEREAS, the City Engineer recommends a contingency of 20% for this project.

NOW, THEREFORE, THE CITY RESOLVES AS FOLLOWS:

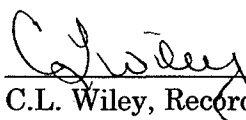
The City Manager is authorized to enter into a contract with DEA for design of sanitary sewer relocations required by the Oregon Street Project for an amount not exceeding \$23,580.

Duly passed by the City Council this 12th day of June 2001.



Mark Cottle, Mayor

ATTEST:



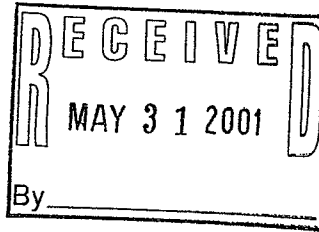
C.L. Wiley, Recorder



DAVID EVANS AND ASSOCIATES, INC.

May 30, 2001

2828 SW Corbett Avenue
Portland, Oregon 97201
Tel: 503.223.6663
Fax: 503.223.2701



Mr. Terry W. Keyes, P.E.
City Engineer
City of Sherwood
20 N.W. Washington Street
Sherwood, Oregon 97140

**REFERENCE: PROFESSIONAL SERVICES PROPOSAL FOR CITY OF SHERWOOD
SANITARY SEWER RELOCATION DESIGN FOR THE WASHINGTON
COUNTY OREGON STREET IMPROVEMENT PROJECT**

Dear Mr. Keyes:

At your request, we have prepared a scope of services for relocating sanitary sewer lines that are in conflict with proposed road improvements for the Washington County Oregon Street Improvement Project. The work includes a combination of work items necessary to accommodate the proposed relocation design.

PROJECT UNDERSTANDING

Background and General Design Approach

David Evans and Associates, Inc. (DEA) is currently under contract with Washington County for design of improvements to Oregon Street between SW Murdock Road and SW Tualatin-Sherwood Road. As part of the road improvements, the County plans to replace the three culverts at Rock Creek with a bridge. To accommodate support abutments of the bridge (as well as a new elevated road section), construction is expected to require considerable full-width excavation of unsuitable underlying soils. Current plans call for excavating all underlying organic silt and peat layers within the road prism to a depth at which bedrock basalt is encountered. The depth of bedrock varies through the Rock Creek flood plain, but preliminary geotechnical investigations indicate that bedrock will be encountered about 8 to 10 feet below the vegetated surface of the flood plain. While the true length of excavation will be determined by conditions found in the field, we estimate the excavation will extend west about 600 feet from about the center of the proposed roundabout to a point lying about 150 feet northeast of the existing intersection of Tonquin Road and Oregon Street.

About 270 feet of 15-inch diameter sanitary sewer lies within the proposed limits of excavation. This sewer extends from a manhole located in the east half of the proposed roundabout (referred to hereafter as the "roundabout manhole") to a manhole located within the Rock Creek flood plain about 30 feet north of the existing Oregon Street roadway. This sewer section (hereafter defined as the "relocated sewer") must be relocated since it will be in conflict with both the proposed excavation and the construction of bridge abutments and the placement of engineered fill on which the elevated road through the flood plain will be constructed.

Selection of pipe diameter and slope must be based on a sound understanding of anticipated peak flows based on ultimate build-out of the upstream drainage basin. The first step in sewer design is

Resolution 2001-961 Exhibit A
June 12, 2001 (6 pages)



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therefore is to develop flow estimates. We have included in this proposal a task for delineating the sewer drainage basin, examining existing land use and future land use coverages, computation of average flows based on industry-standard unit flow factors, and estimation of peak flows using acceptable peaking factors.

Once the alignment of the relocated sewer is established, available slope and the estimate of peak design flow will be used to select an appropriate pipe diameter. We have assumed that DEA will be assigned the responsibility of determining the peak design flow; however, this task can be performed by city staff. If the City wishes to develop peak flows estimates for design, then DEA will proceed with the relocation design based on flow parameters conveyed to DEA in a technical memorandum.

Relocating the Existing 15-Inch Diameter Sewer

Conceptually, the sewer relocation will terminate at the existing 15-inch diameter sewer that extends north through the flood plain (hereafter referred to as the "flood plain sewer"). Since the flood plain sewer will not be included in the relocation, it will define the downstream elevation of the relocated sewer.

Under gravity flow conditions (for which sanitary sewers are typically designed), flow capacity is a function of pipe diameter and slope. Minimum allowable slopes for sanitary sewers have been established to ensure that a minimum flow velocity of 2 feet per second is maintained to keep solids suspended over a wide range of flow. The existing sewer has a slope of 0.105 percent which is to flat for all pipe sizes less than 21 inches in diameter. Note that the flow length of the relocated sewer will be somewhat longer than the existing sewer length. Since the downstream end of the new sewer will remain unchanged, the slope of a relocated sewer will be flatter than the existing slope unless the upstream end of the sewer reach is raised.

The relocation will involve constructing new sewer reaches beyond the proposed limits of excavation. The relocation will be to the north of the existing road into a utility easement shared with the City of Sherwood proposed 12-inch and 24-inch diameter waterlines that will also be relocated as part of this road project. Preliminary alignments for all sewer and water pipelines through the flood plain have already been selected to allow the County to obtain the required easement as quickly as possible.

Potential Relocation of Other Sanitary Sewer Reaches

Raising the upstream invert of the relocated sewer may affect the operation of existing sewers connected to the roundabout manhole. There are two active sewers entering the roundabout manhole. One of these sewers is in Oregon Street and enters the proposed roundabout from the west from a manhole located about midway between G&T Terrace and the roundabout manhole (approximately Sta 0+932 on the road design). The second sewer is in Murdock Road and enters the proposed roundabout from the southwest from a manhole near the south limits of the road project.

The invert of the Oregon Street sewer at the roundabout manhole is about 6 inches above the invert of the existing 15-inch diameter sewer to the flood plain. Therefore, the Oregon Street sewer will be affected if it is necessary to raise the bottom of the roundabout manhole more than about 6 inches to provide additional slope to the relocated sewer. In addition, DEA has determined that the lateral sewer entering the manhole at Sta 0+932 will be in conflict with a proposed retaining wall extending along the south side of Oregon Street. Currently DEA plans to replace the existing manhole in the sidewalk above Oregon Street with a new drop manhole. However, it may be



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necessary to replace the Oregon Street sewer to both resolve the lateral sewer conflict with the proposed wall and to make invert adjustments at the roundabout manhole.

Additionally, the capacity of the Oregon Street and Murdock Road sewers may be exceeded by existing or near-term future flows. The capacities of these sewers relative to anticipated flows will be addressed under the predesign task discussed below. While the design of existing upstream sewer reaches is not included in this proposal, the City may nonetheless wish to consider replacing these sewers now because of the significant cost savings that will be achieved if new sewers are installed during road construction.

DELIVERABLES

We anticipate the plans and specifications for the sewer relocation will be included as part of the Oregon Street Project construction documents. Currently, we believe that the relocated sewer can be depicted in the roadway design drawings with only one additional plan and profile sheet and one additional sheet for details related to sanitary sewer construction. Design survey for the Oregon Street roadway improvements has already been completed as part of the existing DEA contract with the County, and we believe these survey data will be sufficient for sewer design. However, some additional survey work will be required for the sewer relocation such as construction staking that is not included in our current scope of services with Washington County.

SCOPE OF WORK

Our proposed scope of work for this project is as follows:

Task 1: Project Management and QA/QC

DEA will provide coordination for design services including engineering and surveying with the design team for the Oregon Street roadway improvements. The progress and status of these services will also be coordinated with the County. This task includes an internal quality control/quality assurance review of the sewer design.

We understand that design coordination between DEA and the City of Sherwood will be conducted through the County with you as the primary City contact. We will submit progress design plans for the relocated sewer directly to you, and will meet with you and other city staff to discuss review comments. A maximum of three meetings have been included as part of this proposal.

Task 2: Predesign

Under this task, DEA will work with city staff to assess current and future sewer capacity needs. Our investigation will be limited to delineating the existing and future upstream service areas of the relocated sewer, examining recent aerial photographs, and working with city staff to assess future land use. Our analysis will be limited to land currently within the City of Sherwood Urban Growth Boundary. Once the characteristics of the basin are determined, DEA will apply standard unit flow factors for residential, commercial, and light industrial land use to derive average daily flows. DEA will then apply an accepted peaking factor to average daily flow rates and add an acceptable volume for infiltration and inflow to determine the design flow rate for current and build-out conditions. Peak flow rates will be estimated for the relocated sewer as well as the upstream sewers in Oregon Street and Murdock Road.



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Working with the City, DEA will refine the preliminary alignments of the relocated sewers, including any relocation of sewers in Oregon Street and Murdock Road. Finally, sewer diameters and slopes will be selected which are appropriate for the selected alignments and anticipated design flows.

Note that the predesign efforts can be omitted from this proposal if city staff develop flow requirements for relocated sewers. DEA will prepare the sewer relocation design based on flow parameters conveyed to DEA in a technical memorandum that is signed and sealed by the City Engineer or his assign.

Task 3: Engineering Design

Consistent with the design standards of the Oregon Street improvement project, DEA will prepare metric scale engineering plans and specifications for the sewer relocation. The design will include the relocation of the sewer from the roundabout manhole as well as the design of other sewers lying within the road design project limits as identified for relocation under Task 2.

The planning and design of sewer relocations will be conducted on a time scale which lags significantly behind roadway design efforts (currently, the road design is about 90 percent complete). To expedite relocation design, DEA will provide intermediate design drawings and a construction cost estimate for City review that will roughly correspond to a 90 percent submittal. DEA will incorporate City comments directly into the final relocation design. The City will have a final opportunity to review the relocation design as part of the County review of 100 percent roadway design just prior to publishing bid documents.

Task 4: Construction Staking

The current DEA contract with the County includes construction staking for road and roadway-related structures only. During construction, DEA will provide additional construction staking specifically required for sanitary sewer relocation. DEA efforts for this task will be billed to the City on a time and materials basis.

Task 5: Construction Engineering Services

Washington County will administer the bidding process for this contract. However, DEA will be available to answer questions related to sewer relocation during bidding. This service is considered part of the proposed scope contained herein, and is reflected in the hour estimated for that task.

DEA will provide construction support to the City and their assigned inspector in the form of:

- Review submittals.
- Prepare design modifications to resolve conflicts that may arise during construction.
- Attend construction coordination meetings held during relocation construction. DEA anticipates that no more than three 2-hour meetings will be required for DEA staff to aid in the coordination of relocation construction.

Task 6: Record Drawing Preparation

DEA will provide will provide "record" drawings for the City at the completion of the construction project. The drawings will be created from information gathered during construction by the City-designated inspector and from Contractor "as-built" construction plans. To prepare these "record" drawings, the City will provide DEA with construction inspection notes and a copy of the contractor "as-built" plans on which all construction modifications and changes are shown. DEA



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will provide the City with one mylar copy of the "record" drawings and an electronic copy of the drawings in AutoCAD Version 14.0. "Record" drawings will reflect only information identified on "as-built" construction plans and construction inspection notes that are conveyed to DEA. As-built surveys are not included in this scope of work.

ESTIMATED BUDGET

Our estimated budget for the above-listed tasks are presented in the following table.

TASK	BUDGET
Task 1: Project Management and QA/QC	\$ 1,384
Task 2: Predesign	\$ 4,880
Task 3: Engineering Design	\$ 4,980
Task 4: Construction Staking	\$ 2,636
Task 5: Construction Engineering Services	\$ 4,008
Task 6: Record Drawings	\$ 1,762
TOTAL	\$19,650

We propose to complete this work on a time and materials basis at the rates identified in the attached work plan.

We appreciate the opportunity to provide the City of Sherwood with this proposal for design and construction services for sanitary sewer relocation. Please contact us at (503) 223-6663 with any questions.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Don Whitehead, P.E.
Vice President

Michael S. Flanigan, P.E.
Project Engineer

Attachment
MSFL:kbb

WORK PLAN

Oregon Street Improvements

City of Sherwood Sanitary Sewer Relocation Design

May 30, 2001

TASK	DESCRIPTION	PIC	PE	ADMIN	TECH	PLS	SURVEY	EXPENSES	TOTAL
1	Design Management and QA/QC	2	8	4				\$200	\$1,384
2	Predesign	2	32	4	24				\$4,880
3	Engineering Design	2	32	4	24			\$100	\$4,980
5	Construction Staking		2			8	16		\$2,636
6	Construction Engineering Services	1	24	4	24				\$4,008
7	Record Drawings		8		16			\$50	\$1,762
	Total Hours:	7	106	16	88	8	16		
	Rate:	\$120	\$94	\$48	\$60	\$86	\$110		
	Total:	\$840	\$9,964	\$768	\$5,280	\$688	\$1,760	\$350	\$19,650

Principal-in-Charge PIC \$120/hr
 Project Engineer PE \$94/hr
 Administrative Assistant ADMIN \$48/hr
 AutoCAD Technician TECH \$60/hr
 Professional Land Surveyor PLS \$86/hr
 Two Man Survey Crew SURVY \$110/hr
 EXPENSES @ Cost