

## **PRE-DESIGN**

### **11.00 PROCEDURES**

#### **11.01 PURPOSE**

This section covers the planning, research, and development of existing information which is necessary prior to the actual design of an infrastructure project. A careful pre-design process will reduce the number of conflicts and problems which may arise during the design process. This section is intended to be a guide for City staff in the development of a City construction project, but some information in this section may be useful to private engineers in the development of Public Improvement Permit Projects.

#### **11.02 JOB-SITE FIELD INVESTIGATION**

It is important to become familiar with the proposed job-site. Sufficient visits should be made to the site during the pre-design and design phases in order to complete an accurate site map and plan. The first of these trips should be accomplished immediately after receiving the job assignment to acquaint the engineer with the area and to alert him/her to problems and concerns which may arise. Photos of the project site should be taken at this time. They will be used as a reference source and to assist the engineer in visualizing the site once back in the office. Photos, and particularly video tape documentation, should be taken prior to the construction phase to help determine the condition of existing culverts, inlets, concrete slabs, etc.; to help visualize existing vegetation, to help later restore yards and lawns to their original condition, and to establish whether existing concrete driveway slabs or other structures had pre-existing cracking or other damage prior to the construction of the project.

#### **11.03 ORDERING TESTS**

As early as possible, the engineer should order all field testing to determine the existing site conditions of the project. Soil bearing tests may be needed to define the street structural section and the density of soil and subgrade. Soil bearing tests and a non-destructive pavement analysis are needed to analyze the strength of existing paving before designing a street overlay. Boring, pot-holing, or soil tests may be required on large drainage or sanitary sewer projects. Tests can be scheduled by notifying a number of certified materials labs throughout the area.

#### **11.04 UTILITY LOCATES**

Prior to start of design, the engineer shall call for utility locates (One-Call 1-800-332-2344), specifying that the locates are for design purposes. These markings shall then be included in the topographic survey of the site. When in doubt as to the depth of the facilities, the engineer should contact the individual utility companies and request the engineering or field representative provide further information. For pot-holing, coordinate with the specific utility to locate underground systems and notify the one-call notification system that digging is proposed.

The major utility companies serving within the Springfield city limits and the Urban Growth Boundary are:

<u>Utility</u>	<u>Type</u>	<u>Area Served</u>
Springfield Utility Board	Water	Entire City
	Electric	Entire City
Northwest Natural Gas	Gas	Entire Area
Qwest	Telephone	Entire Area
AT&T Cable Services	TV Cable	Entire Area
Sprint	Fiber Optics	West Side of City
Rainbow Water District	Water	Northwest UGB
EWEB	Water	Transmission Mains
		Areas North of Q Street
	Electric	Transmission Lines
		Areas North of Hayden Bridge Road

Various other telecommunications companies operate facilities within the entire area.

### **11.05 TOPOGRAPHIC NOTES**

A topographic survey will be required to establish data collection points of existing features such as manholes, valves, inlets, poles, trees, asphalt mats and concrete slabs, underground utilities as marked on the ground, flowline elevations of existing pipes in manholes and inlets, corner pins and right-of-way monumentation, centerline, and all irregularities or unusual aspects of the surrounding ground. Surveyors shall provide accurate and complete site maps to be used for calculating excavation quantities.

Following the survey, and after a hard copy of the points has been configured and plotted, the engineer should walk the job-site and verify the objects in the field.

### **11.06 RESEARCH**

All good designs require careful, comprehensive research of existing information and services. A majority of information relating to the public right-of-way is stored in the files of the Engineering Division, and often times at the Maintenance Division, e.g., video tape documentation of sewer pipes. The Building Division is a good source for finding sewer tap locations and can help determine if a building is hooked to the sanitary sewer.

Review the project file regarding how the project came about and any documentation regarding the project to this point. Past correspondence may shed some light on areas of concern. Also, some of the research required may already have been done and may be in the files.

Right-of-way and property line information can be checked against Lane County tax maps and the plats of subdivisions that have a bearing on the proposed project. If a property is not shown on the plat, a title search, deed, or record can be ordered through any local title company. Deeds will provide a check on property ownerships. The Regional Land Information Database (RLID), maintained by Lane Council of Governments, is also a direct source for obtaining property ownership information.

Existing drainage and sanitary sewer information is available from the City's aerial sewer maps and as-builts. Location of sanitary sewer laterals can be acquired from TV reports and Building Division files, as discussed above. All sources should be checked, including City Sanitary and Sewer Drainage Master Plans, and other published studies. They will show planned future facilities. They also outline deficiencies in the existing systems.

Planned future drainage and sanitary sewer information is available from the City's master plans and published studies, including the following:

- A. *Storm Drainage Study for East Springfield*, Brown and Caldwell, June 1979.
- B. *Sanitary Sewer Master Plan*, Kramer, Chin & Mayo, Inc., July 1980.
- C. *West Springfield Drainage Master Plan*, Kramer, Chin & Mayo, Inc., June 1983.
- D. *Cedar Creek Drainage Study*, CH2M Hill, September 1984.
- E. *North Springfield Sewer Study*, CH2M Hill, October 1991.
- F. *SCS Channel No. 6 Project Final Report*, Brown and Caldwell, March 2001.

Also check with the City's Maintenance Supervisor about planned Sewer Rehabilitation or Inflow and Infiltration (I & I) Abatement Projects.

Designer shall check with Maintenance Supervisor about planned rehabilitation or I & I abatement projects.

All information relevant to the design should be obtained from street and sewer as-builts, locates and data collection in the field, and from records of all construction projects and subdivisions adjacent to, or in close proximity to, the project site. These sources can be important for designing grades at intersections, sizing sewer pipes, and locating drainage structures at critical points.

Check with the Development Services Department for current zoning or proposed changes, refinement plans and other adopted documents, and for preliminary development plans in the same vicinity of the project. Future land use and zoning changes could have an effect on street and sewer designs. Project design shall consider the full development potential for the land and infrastructure. Check with the Traffic Division for future street planning, specifically the "Local Street Network Plan" and "TransPlan." Also check for properties that have been recently partitioned or subdivided but are not yet shown on the tax maps. Partitions and subdivisions could affect the number of sanitary sewer laterals that need to be installed and may need to be considered when sizing a main line.

### **11.07 PRE-DESIGN MEETING**

To help facilitate the design process, a pre-design meeting is essential for setting guidelines for the engineer and for establishing a forum to discuss specific problems of the project. As an in-house tool, a pre-design meeting can be an occasion when the traffic and civil engineering representatives can review worksheets, photos, related as-builts, discuss utility conflicts, street widths, drainage, property owner concerns, design alternatives, and possible solutions.

For larger and more complex jobs, weekly design meetings are an invaluable method for keeping the project on track and for meeting deadlines. A pre-design meeting with the individual designers helps to determine each person's area of responsibility and to establish a time line for finishing the design of the project.

## **11.08 SURVEY CONTROL**

Every project needs a control traverse to tie existing monumentation from a recorded County Survey within the project vicinity. If a recorded County Survey does not exist within the project vicinity, a control traverse needs to be tied to the closest nearby recorded County Survey or the closest nearby Monumentation with published coordinates. Examples are Lane County Control Monuments (available from the County Surveyor's office), City of Springfield centerline monuments (available from the City Surveyor's office), or NGS published geodetic control (available via NGS Datasheets). All monumentation will be shown and labeled clearly with the full description of the monument, the source of information for the referenced monument (County Survey File number, County Control Monument number, City control monument number, NGS point ID, etc.) and ties between at least 2 record monuments with record and measured bearing and distance labeled.

Controlling right of ways, easements and property lines within the project vicinity must be tied to the monumentation. Horizontal control and all coordinates must be done in the NAD (North American Datum) 83/91 coordinate system and shall be of such accuracy as to meet or exceed the requirements of O.R.S. 92.050(2). NAD 83/91 coordinate data may be obtained from the control monument's published data source, or it may be requested that the City Surveyor's office provides NAD 83/91 coordinate data for 2 or 3 project control points, which will be visible and lathed, with a minimum of 2 weeks notice. A project centerline with bearings, distances, curve information, and ties to existing monumentation shall be shown on the submitted construction drawings and As-Built plans. All As-Built drawing sheets shall be submitted on the same coordinate system and one continuous coordinate model shall span the entire project.

It is the responsibility of the Engineer and contractor at their expense, to locate, protect, and replace existing monumentation within the project vicinity. It is their responsibility to retain the services of an Oregon Professional Land Surveyor (PLS) for the determination of boundaries and the setting or removal and replacement of monuments. Monuments that are destroyed and reset following construction are to be reported on the As-Built drawings. Please note the As-Built drawings shall in no way limit or alleviate the requirements for replacement of destroyed monumentation under O.R.S. 209.150 and 209.155. Copies of ties performed by the PLS and plats filed for monuments replaced shall be given to the City Surveyor for maintaining City of Springfield records. All monument replacement work must be completed before the As-Built drawings will be approved.

Vertical control for the project must be tied to a published vertical benchmark or to a City of Springfield vertical benchmark. The location of nearby benchmarks and their elevations can be requested from the City Surveyor's Office for the project area. All elevations and vertical datum on the As-Built must be in NAVD 88. The City's benchmarks are reported in a City of Springfield datum, and the City Surveyor's office can provide the conversion factor from City datum to NAVD 88. Benchmarks used for a project shall be shown and labeled with the type, elevation, datum and source of published information on both the construction drawings and on the As-Built plans. Every effort must be made to ensure that a vertical benchmark is not disturbed or destroyed. But, if it is not feasible in any way to protect the benchmark, the following procedures will be followed. If a City benchmark is to be destroyed, the Engineer or contractor shall contact the City Surveyor at least one week in advance to arrange for its replacement after construction. If the benchmark is not owned by the City, the owner of the benchmark shall be contacted and procedures for that agency followed for its replacement. New benchmarks or benchmarks that have been destroyed need to be noted on the As-Built drawings.

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