

Chapter

15

**CONTRACT
PLANS,
SPECIFICATIONS
AND ESTIMATES**

15.1 INTRODUCTION

Throughout the Project Development process, the primary milestone used for reference is the project's PS&E submittal date, which other deliverables are measured against. If planned deliverables and milestones are not met, this can cause the project's PS&E submittal date to slip, usually in increments of one month. This can cause serious repercussions to the constructability of the project due to time sensitive windows such as paving seasons, permit dates for in-water-work requirements, budgeting, etc.

For additional information about the project delivery process, consult the [ODOT Project Delivery Guide 2010](#).

15.2 PLAN PROCEDURE

15.2.1 GENERAL

Each of the Regional Technical Centers has their own unique process for developing and reviewing their plans, specifications, and estimate. The specific Region process will determine the milestones and type of review required for the project.

For additional information about the project delivery process, consult the [ODOT Project Delivery Guide 2010](#).

15.3 PLAN PREPARATION

15.3.1 GENERAL

Plan preparation is a team effort and communication between all team members is paramount. This requires direct communication between different disciplines as well as regular communication between the design engineer and the drafter. The design engineer and the drafter need to work well with each other and clearly understand each other's unique role in the plan preparation process. The design engineer is responsible for the content of the design and for the constructability of that design. The drafter is responsible for the presentation of those ideas on the plans in a format that is consistent statewide. Plan consistency is important for contractors bidding work from different geographical locations. There are standardized methods for showing the construction items in the Contract Plans Development Guide (CPDG)). Following the methods shown will assist both drafters and designers in keeping a more consistent look and feel to the ODOT plans. The CPDG is used to manage consistency for ODOT.

All of the final drawings in the plan set that convey technical information are required by Oregon Revised Statutes 671 and 672, that the professional in charge of the data place their professional seal on each specific drawing. No professional seal is required on the title sheet or on the sheet containing the index of drawings, as these sheets convey only general project information and are not technical in nature.

15.3.2 TITLE SHEET & INDEX SHEETS

The title sheet includes several items of information relative to the project and/or plans. It has additional sheets for the index of plan sheets which identifies all plan sheets in a specific order as outlined in the CPDG. It has a title block which lists the major work items, name of the project, highway, county, and letting date. A vicinity map shows the project location, beginning and end of the project, and the Federal-Aid project number.

Other items to be found on the title sheet or on the index sheets are a listing of standard drawings, listing of Right of Way maps used on the project, length of the project, a small scale map with the general project location indicated by an arrow and a block for the Technical Services Manager/Chief Engineer's signature.

15.3.3 TYPICAL SECTIONS & DETAILS

Typical sections represent the final cross sections of the roadbed and show the following items: lane, shoulder, and median widths; surfacing materials and thickness; roadbed slopes; profile grade locations; and curbs and walks. The limits of each typical section, including tapers, are indicated by stationing and shown below the typical section. Equations are shown in the typical sections only when the difference between the 'ahead' station and the 'back' station is greater than 50 feet. Differences in stations of an equation that are less than 50 feet do not affect the quantities enough to be considered significant. Typical sections normally begin on Sheet 2.

Special details for design features are prepared when required information is not available in the Oregon Standard Drawing. These details are located immediately after the typical sections.

15.3.4 TRAFFIC CONTROL PLANS

Specifics to the Traffic Control Plans can be found in the ODOT Traffic Control Manual and the CPDG. The Traffic Control Plans offer a method to direct traffic through the project site during construction. The plans also suggest a method for staging the project to protect work areas and keep traffic moving through the site. Typically the contractor will propose another method for temporary traffic control, but a temporary traffic control method must be provided by either plan sheets and specifications or specifications alone.

For additional information about Traffic Control Plans, consult the [ODOT Traffic Control Plans Design Manual](#).

15.3.5 EROSION AND SEDIMENT CONTROL PLANS

The roadway designer gives a copy of the design files to the erosion control designer after all roadway profiles, are defined and creation of finished grade surfaces, establishing cut and fill limits, are completed. The information necessary for developing a base map for erosion control should include, but not be limited to, right of way and easements, all drainage features, cut and fill lines and expected slopes, and contour lines of existing ground.

When stage construction is required the Traffic Control Plans should also be submitted to the erosion control designer so erosion control design can be prepared for each stage.

A complete set of plans, details, specifications, bid items, quantities and unit costs must be prepared for inclusion in the construction contract. A complete discussion on plan preparation for erosion and sediment control plans is included in Chapter 6 of [the ODOT Erosion Control Manual](#).

15.3.6 MATERIAL SOURCE, STOCKPILE, AND DISPOSAL SITE PLANS

These sheets include a small scale map showing the location and layout of the sites with typical cross sections and other details necessary to delineate placement or removal of materials. Information required for developing these sheets is included with the field data. Site locations are indicated on the title sheet. If the site is mandatory, a letter of public interest must be prepared and approved for the mandatory site prior to submitting the final PS&E package. Lower costs and environmental considerations are generally good reasons to use a mandatory site.

15.3.7 PIPE DATA SHEET

A Pipe Data Sheet is required when more than a few runs of pipe are included in the project. Care should be taken to ensure information on the Pipe Data Sheet agrees with the Construction Plans. Alternate pipe materials are required by Federal Regulation on federally funded projects. To consider metal pipe as an alternate pipe material, the designer should request soil tests for pH and resistivity at specific locations early in the design process, if this information was not included in the field data. **Pipe Data Sheets which include pipes and/or drainage structures that are also detailed on bridge drawings should be reviewed and initialed by the appropriate Bridge Designer.**

15.3.8 PLANS, CONSTRUCTION NOTES, AND PROFILES

15.3.8.1 PLAN SCALES

Base plan sheets showing existing roadway, drainage, utilities, and other topography are prepared by the designer and drafter. The scale ratio shall be 1" = 100' horizontal and 1" = 10' vertical; or 1" = 50' horizontal and 1" = 5' vertical. On smaller projects in cities, 1" = 20' horizontal and 1" = 2' vertical scale may be used.

15.3.8.2 CONSTRUCTION NOTES

The construction note is listed on the plan sheet and generally includes both a contractor instruction and the quantity of material for that construction item. Using a unique number to identify each specific construction note, the same number is used indicating the location of the work in plan view. Notes are usually shown in the right margin of the corresponding plan sheet or on a separate sheet if space is not available. The construction note numbers are specific to each unique plan sheet.

Quantities of surfacing, earthwork, and watering materials will be rounded using this chart.

<u>Calculated Quantity</u>	<u>Round UP to the nearest</u>
0 - 99 units	Actual
100 - 999 units	10 units
1,000 - 9,999 units	100 units
10,000 - 99,999 units	500 units
100,000 units and over	1,000 units

Earthwork quantities should be rounded in the earthwork bracket distributions such that they meet the above chart and match the quantities in the estimate.

Pipe lengths are to be measured center of structure to center of structure along the slope, for each pipe length. Each length listed in the construction note is to be rounded up to the next whole foot.

Guardrail lengths are to be divisible by 12.5 ft.

Typically called out in the construction notes are removal of guardrail, fences, pipes, and other removal items that are not removed as a part of the work shown in the typical sections. Those items will include the quantity in the construction note. In the special provision under Removal of Structures and Obstructions, these items will be specifically listed noting that the quantities are shown on the plan sheets and are included in the bid item. Usually this is a lump sum bid item for the contractor.

The format of the construction notes is important. The standard format for the notes is listed in the CPDG. The format was developed over a number of years by ODOT staff and by working with the contracting community. As much as possible the standard note format is to be used. The format is tied to the Oregon Standard Specifications for Construction, with the standardization reducing construction disputes. For example fence quantity lengths used to be shown on each plan sheet until it resulted in multiple contractor disputes over the total bid item length and the itemized lengths in each construction note. Standard practice now is to not show the sheet by sheet length for fence but only the total quantity shown in the bid list. It might appear to be a simple change to the construction note format, in this example by adding fence length to the note on the sheet, but a "simple" note format change can result in a contract dispute during the construction phase. It is the drafter's role to keep the format of the construction notes as close as possible to the standard format shown in the CPDG.

15.3.8.3 PROFILES

Profiles of the proposed alignments, when required by the project, will be shown on the same scale and normally on the bottom of the plan sheet. If no space remains on the plan sheet, profiles are shown on separate sheets.

The Profile Sheet shows existing ground lines, proposed vertical alignments and grades, proposed and pertinent existing sewer profiles with appropriate grades and elevations, earthwork brackets and other special information. Drainage and water quality information may be shown on separate profile sheets.

15.3.9 STRIPING

The [ODOT Traffic Line Manual](#) details permanent striping. Striping plans will be included in the plan set when agreed to by the Project Team. Striping plans are developed by either the roadway designer with input from the Region Traffic Engineer or by the traffic designer.

15.3.10 WETLAND MITIGATION

Working with the Region Environmental personnel, the designer normally prepares plans for wetland mitigation when required. These plans show locations of wetlands and methods of mitigation by use of sketch maps, typical cross sections, and special details.

15.3.11 ROADSIDE DEVELOPMENT

The Environmental Unit in each Regional Technical Center is responsible for the plans, special provisions, and estimate for irrigation and landscaping needs along roadside and parking areas. See [Section 10.9](#) for more information about Roadside Development.

15.3.12 TEMPORARY EROSION CONTROL

Plans for erosion control for areas of soil disturbance in ODOT right of way and for required offsite material sources/stockpiles/disposal sites are prepared for the project by working with the Geo/Hydro staff in the Regional Technical Center. Those plans can be prepared by either the roadway design or the geo/hydro designer based on the project complexity and the specific Regional Technical Center. The plans show locations of temporary erosion control best management practices facilities by the use of details and any combination of separate plan sheets, additional information on roadway plan sheets, and/or table of locations.

15.3.13 STANDARD AND INFORMATIONAL DRAWINGS

Oregon Standard Drawings called for within the contract plans and special provisions are listed on the index sheet of the title sheet. The Oregon Standard Drawings called out on the title sheet are inserted during final assembly of the contract plans for printing. Informational drawings are normally plans of existing facilities, usually structures, which are included to assist the

contractor in the bidding, staging, and construction. They are stamped "Informational Only" and are listed on the title sheet as such.

15.3.14 OTHER PLANS

Bridge Engineering, Traffic Engineering and Geo/Environmental Engineering provides plans, special provisions, and estimate for structures, sound walls, traffic signals, permanent signing, striping, and illumination for inclusion in the contract. These plans are reviewed by the Roadway Designer for concurrence with the roadway plans. **The Bridge Designer initials all roadway plan sheets that reference structure work.** This is to assist with the coordination of the details between the roadway plans and the structures shown.

15.4 SPECIFICATIONS

15.4.1 GENERAL

Specifications are detailed and exact statements prescribing scope, materials, workmanship, acceptance criteria, and method of measurement and payment for something to be built, installed, or manufactured.

The sequence of events for a specifications writer to produce the Special Provisions and bid booklet for a project is contained in the [ODOT Specification and Writing Style Manual 2009](#).

15.4.2 STANDARD SPECIFICATIONS

The Oregon Standard Specifications for Construction is a two volume document that is the base construction contract for public work projects. This document was developed with partners from Oregon APWA members to be used on state, county and city projects. This document encompasses all the standard specifications approved for use on ODOT projects by the ODOT Chief Engineer, FHWA, and the Oregon Department of Justice. Volume 1 covers the General Requirements that are found in Part 00100 of the Standard Specifications. Volume 2 represents the Technical Specifications that generally require modifications specific to the unique project. Part 00200 through Part 03000 contain the Technical Specifications

The construction of buildings is an element of work not covered in the "Oregon Standard Specifications for Construction." Specifications from the Construction Specifications Institute (CSI) are used by the Facilities Management Section for the construction of buildings.

15.4.3 SUPPLEMENTAL STANDARD SPECIFICATIONS

Supplemental specifications are specifications that are not in the standard specifications, new specifications, or rewritten specifications that are stand-alone specifications inserted into contract documents

15.4.4 PROJECT SPECIAL PROVISIONS

Every project has special individual needs that are unique to that project. The Special Provisions are created from the Boiler Plate Special Provisions. Modifications to the Boiler Plate language to match the individual project circumstance are made. Conversation with the technical expert

for the particular Boiler Plate Special Provision Part during the refinement of the Project Special Provisions is encouraged.

15.4.5 GUIDELINES, PROCEDURES, AND REQUIRED FORMS

The procedures followed by each specification writer are delineated in the [Specifications and Writing Style Manual 2009](#).

Additional information and forms can be found on the Specifications web page at <http://egov.oregon.gov/ODOT/HWY/SPECS/pages/index.aspx>

15.5 FINAL ESTIMATE

15.5.1 GENERAL

The programming estimate shows the designated funds set aside for the project. This estimate normally has an Engineering and Contingencies (E&C) value of 40%, and is the amount shown in the prospectus. It is usually the amount shown in the Statewide Transportation Improvement Program. This estimate is subject to refinement in the course of the project's preparation.

Additional estimates are prepared during project development and each one should become more detailed. It is important that each of these detailed estimates include all project items and costs. Items such as shoulder rock on preservation projects or quantities for aggregate sub-base, base, and asphalt at guardrail flares might seem insignificant but can have substantial impact to project estimates.

Estimates prepared during project development are considered confidential, and should be handled accordingly at all times especially if shared electronically.

15.5.2 ANTICIPATED ITEMS

Anticipated Items are used to provide a funding mechanism only for non-biddable elements of work that may be needed to complete a project. Anticipated Items should be identified prior to completion of PS&E. The use of anticipated items is acceptable when there is a high likelihood that non-biddable costs will be incurred. Examples of common anticipated items include statistical asphalt bonus, asphalt smoothness bonus, railroad flagging, asphalt and/or fuel escalation, steel escalation, public information and relations, and migratory bird monitoring.

ODOT has received guidance from FHWA on this matter. FHWA believes that anticipated items should not be created for items of work that can be competitively bid. ODOT's and FHWA's policy discourages the use of Anticipated Items for unfinished, incomplete design work. Using anticipated items in this manner will result in ODOT negotiating with a contractor for the work and most probably, paying a higher price than had it bid competitively.

Requests for anticipated items must be approved in writing by the Area Manager and the OPL Manager for all anticipated items on all projects, including anticipated items added after PS&E and/or bid opening. FHWA must also approve anticipated items on full federal oversight projects.

15.6 PROJECT SUBMITTAL

The Office of Project Letting is the group that formally receives the projects ready for bid letting. The information about the requirements for submittal can be found in the [PS&E Delivery Manual](#). Other important information can be found on the Office of Project Letting's pre-letting website <http://egov.oregon.gov/ODOT/HWY/OPL/pre-letting.shtml>